



2017 PREVENTIVE MAINTENANCE SPECIFICATION

PART 1
GENERAL INFORMATION

TABLE OF CONTENTS

PART 1 - GENERAL INFORMATION:

Section 1.0 Title Page Section 1.1 Table of Contents

PART 2 - GENERAL REQUIREMENTS:

Section 2.0 Scope of Work

PART 3 - MECHANICAL SYSTEMS TASKING:

Condensing Units
Fan Coil Units
Furnaces
HVAC Temperature Controls
Heat Pump
Packaged Rooftop HVAC Units
Packaged Self-Contained Heating and Cooling Units
Refrigerant/Filters
Variable Frequency Drives/Variable Air Value Boxes

PART 4 - MECHANICAL EQUIPMENT INVENTORIES:

Section 4.0 CMHA Annex (1407 Cleveland Avenue) Section 4.3 CMHA Central Office (880
11th Avenue)

**PART 2
GENERAL REQUIREMENTS**

SECTION 2.0 – SCOPE OF WORK

1. **Scope of Work**

- A. Tasking information in Part 3 is provided to define the scope of work for each mechanical system component covered in this Service and Maintenance Specification. Detailed instructions are given on tasks that are required as part of this contract.
- B. Scheduling for this work is indicated as part of the tasking information for individual equipment items in terms of the frequency for each task to be carried out during the p e r i o d of one year. The Contractor can arrange his specific schedule for starting the work regarding the time of year, but work will be provided for the contract at the intervals listed in the tasking section.
- C. Inventories of the mechanical equipment at each facility are provided in Part 4 for the convenience of the Contractor for bidding and coordination purposes. This information was gathered from existing records and from site investigation at each location.
Mechanical equipment inventories do not necessarily indicate the entirety of the equipment to be serviced and maintained as part of this contract. It is the intent of this specification that as part of the work, the contractor shall provide service and preventive maintenance for all equipment in each facility that is identified in the tasking section whether it is listed in the inventory. The inventories basically indicate equipment present in central or main mechanical rooms. Remote equipment, such as may be serving individual resident rooms or units, staff areas, housekeeping areas, public spaces, etc. are to be included in the service and maintenance agreement as they appear in the tasking sections.
- D. The Contractor shall provide **quarterly** reports at four month intervals to the Owner and to his representative inclusive of the following information:
 - 1. Routine and preventive maintenance service work **performed** during the year.
 - 2. Findings and recommendations on the status of all mechanical equipment items and the **costs** to repair such if these items(s) are not included in the base contract.

**PART 2
GENERAL REQUIREMENTS**

SECTION 2.1 – BIDDING

1. Bidding

- A. The Contractor shall provide **separate** costs for all mechanical portions of the work including mechanical bid alternates. These costs are identified on Bid Form Attachment E in the front-end Bidding and Contract Information of the specifications.
- B. The Contractor shall provide a **guaranteed** hourly rate for **all** work required during the term of the contract that is not covered in the base specifications as requested by the Owner or by his representative in writing. These costs are identified on Bid Form 2 in the front-end Bidding and Contract Information of the specifications.

2. Mechanical Systems Service

Service for mechanical systems is defined as **all routine and preventive maintenance labor, all preventive maintenance material, all repair labor and all repair material**. The preventive maintenance labor and preventive maintenance material shall provide **all** work as indicated in individual tasking sections for each item of mechanical equipment. This includes **all** scheduled service visits, including labor and material required to perform inspections, testing, and preventive maintenance on **all** equipment indicated in the mechanical tasking sections. The repair labor and repair material shall provide **all** work necessary to restore mechanical systems or individual items of mechanical equipment to a **working and fully operational condition**. Repair materials may be new, used or reconditioned. Work shall be provided to restore any equipment failure and will exclude total equipment replacement due to obsolescence or unavailability of parts. Service will be available 24 hours a day, 7 days a week, 365 days a year including holidays.

PART 3 – MECHANICAL SYSTEMS TASKING

PART 3
MECHANICAL SYSTEMS TASKING

SECTION 3.0 - CONDENSING UNITS

A. Equipment

1. Packaged air cooled condensing units which include the following components and accessories:
 - a) Compressors, condenser coils, condenser fans, motors, crankcase heaters, charging valves, discharge service valves, pressure relief valves, temperature/pressure gauges, flow switches, oil pressure switches, low suction pressure switches, high discharge pressure switches, timers, relays, sequencers, unloaders, vibration isolators, integral controls, and motor starters.

B. General Items

1. Check in with Owner Representative.
2. Review submittals and documentation of equipment as provided by Owner. Discuss operation of equipment with Owner in order to determine problems and tendencies of such.

C. General Service and Maintenance

1. Verify operation of compressors, condenser coils, condenser fans, motors, crankcase heaters, pressure relief valves, temperature/pressure gauges, flow switches, oil pressure switches, low suction pressure switches, high discharge pressure switches, timers, relays, sequencers, unloaders, vibration isolators, integral controls, and motor starters.
2. Verify refrigerant charge.
3. Test accuracy of all temperature and pressure gauges.
4. Inspect for vibrations and unusual noises in bearings, motors, etc.
5. Verify superheat adjustment.
6. Inspect moisture indicator for evidence of moisture.
7. Record compressor suction, discharge, and oil pressures.
8. Clean all debris from air inlet louvers and screens.
9. Brush/clean condenser coils to remove soil.
10. Test for secureness of guards, doors, and panels.
11. Inspect all structural elements for corrosion and damage.

D. Specialized Service and Maintenance

1. Compressors:
 - a) Inspect vibration eliminators for secureness and damage.
 - b) Test for refrigerant leaks and report results.
 - c) Lubricate motor bearings and couplings.
 - d) Clean air intake screen on motor.
 - e) Inspect motor windings and report condition.
 - f) Check shaft alignment and align such as needed.
 - g) Tighten control terminal connections at heater elements.
 - h) Test secureness of mounting points, and tighten all major points.
2. Condenser Fan Motors:
 - a) Inspect for vibrations and unusual noises in bearings, motors, etc.
 - b) Wipe down and clean motors of loose soil and oil buildup.
 - c) Inspect tension on drive and fan belts. Adjust tension or change belts as needed.
 - d) Inspect fans for vibrations and tightness.
 - e) Lubricate motor bearings.
 - f) Inspect wiring and connections for signs of wear, overheating, burns, etc.
 - g) Inspect all structural elements for corrosion and damage.
3. Integral Controls:
 - a) Verify operation of oil temperature control. Test and record oil high temperature cutout. Calibrate cutout control as needed.

PART 3
MECHANICAL SYSTEMS TASKING

- b) Verify capacity of control reaction.
 - c) Test and record high pressure safety. Calibrate safety control as needed.
 - d) Test and record freeze control cutout. Calibrate cutout control as needed.
 - e) Test and record low pressure cutout. Calibrate cutout control as needed.
 - f) Verify operation of bypass valve.
 - g) Verify operation of fan speed control and fan cycling controller.
4. Motor Starters:
- a) Inspect wiring for secureness and damage.
 - b) Inspect contactors, terminals, relays, and fuses for signs of wear, arcing, overheating, burns, etc.
 - c) Inspect electrical connections for tightness and absence of moisture.
 - d) Measure and record operating voltage and amperage.
5. DX Condensing Cooling Coils:
- a) Inspect coil for leaks or damage.
 - b) Brush and clean coil to remove soil and debris.

E. Reports

1. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the operational status and condition of the following equipment:
 - a) Compressors, condenser coils, condenser fans, motors, crankcase heaters, pressure relief valves, temperature/pressure gauges, flow switches, oil pressure switches, low suction pressure switches, high discharge pressure switches, timers, relays, sequencers, unloaders, vibration isolators, integral controls, and motor starters.
2. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the operating voltage and amperage of the following equipment:
 - a) Motors, and integral controls.
3. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the suction pressures and discharge pressures for the compressors.
4. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming any irregular conditions; existing or potential operational problems; and repair requirements, if applicable.

F. Schedule

1. Perform tasking procedures 2 times within a calendar year, at 6 month intervals, from March 15 thru November 15. These procedures are for the following:
 - a) C. General Service and Maintenance:
 1. Items 1 - 11.
 - b) D. Specialized Service and Maintenance:
 1. 4. Motor Starters: Items a - d.
2. Perform tasking procedures 1 time within a calendar year, at a 12 month interval, from March 15 thru November 15. These procedures are for the following:
 - a) D. Specialized Service and Maintenance:
 1. 1. Compressors: Items a - h.
 2. 2. Condenser Fan Motors: Items a - g.
 3. 3. Integral Controls: Items a - g.
 4. 5. DX Condensing Cooling Coils: Items a - b.
 - b) D. Specialized Service and Maintenance:
 1. 1. Motor Starters: Items a - d.

PART 3
MECHANICAL SYSTEMS TASKING

SECTION 3.1- FAN COIL UNITS

A. Equipment

1. Packaged fan coil units which include the following components and accessories:
 - a) Actuators, dampers, coils, condensate pans, fan motors, bearings, shafts, drives, belts, access doors, filter racks, electric heaters, switches, motor starters, integral temperature controls, air filters, and flexible duct connections.

B. General Items

1. Check in with Owner Representative.
2. Review submittals and documentation of equipment as provided by Owner. Discuss operation of equipment with Owner in order to determine problems and tendencies of such.

C. General Service and Maintenance

1. Verify operation of motors, fans, dampers, actuators, coils, electric heaters, and integral controls.
2. Inspect flexible connections and ductwork for damage and leaks.
3. Inspect tension on drive and fan belts. Adjust tension or change belts as needed.
4. Lubricate fan shaft bearings, motor bearings, dampers, linkage, access doors.
5. Clean air intake screen on motor.
6. Inspect fan wheel for free rotation, cracks, and alignment.
7. Inspect for vibrations and unusual noises.
8. Test secureness of guards, doors, and panels.
9. Inspect all major stop valves.
10. Inspect all structural elements for corrosion and damage.
11. Test dampers and actuators for proper operation. Adjust dampers and actuators as needed.
12. Inspect and replace all disposable air filters with new 40% efficiency (minimum) type filters.

D. Specialized Service and Maintenance

1. DX Evaporator Cooling Coils:
 - a) Inspect coil for leaks or damage.
 - b) Brush and clean coil to remove soil and debris.
2. Electric Heating Coils:
 - a) Inspect coil for damage to element.
 - b) Inspect isolators for damage or cracks.
 - c) Brush and clean coil to remove soil and debris.
 - d) Torque heating terminals as required for secureness.
 - e) Verify staging of heating elements.
3. Motor Starters:
 - a) Inspect wiring for secureness and damage.
 - b) Inspect contactors, terminals, relays, and fuses for signs of wear, arcing, overheating, burns, etc.
 - c) Inspect electrical connections for tightness and absence of moisture.
 - d) Measure and record operating voltage and amperage.

E. Reports

1. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the operational status and condition of the following equipment:
 - a) Dampers, actuators, DX cooling coils, electric heating coils, fan motors, air filters, condensate drain pans, and integral controls.

**PART 3
MECHANICAL SYSTEMS TASKING**

2. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the operating voltage and amperage of the following equipment:
 - a) Fan motors, and integral controls.
3. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming any irregular conditions; existing or potential operational problems; and repair requirements if applicable.

F. Schedule

1. Perform tasking procedures 4 times within a calendar year, at 3 month intervals, for the following:
 - a) C. General Service and Maintenance:
 1. Item 12.
 2. Perform tasking procedures 1 time within a calendar year, at a 12 month interval, for the following:
 - C. General Service and Maintenance:
Items 1- 11.
 - D. Specialized Service and Maintenance:
 1. DX Evaporator Cooling Coils: Items a - b.
 2. Electric Heating Coils: Items a - e.
 3. Motor Starters: Items a - d.

PART 3
MECHANICAL SYSTEMS TASKING

SECTION 3.2 - FURNACES

A. Equipment

1. Packaged gas fired furnace units which include the following components and accessories:
 - a) Actuators, dampers, coils, heat exchangers, fan motors, bearings, shafts, drives, belts, gas train assemblies, burner assemblies, pilot assemblies, ignition assemblies, gas valves/regulators, safety switches, limit switches, sensors, flues, access doors, air filters, flexible duct connections, motor starters, and integral temperature controls.

B. General Items

1. Check in with Owner Representative.
2. Review submittals and documentation of equipment as provided by Owner. Discuss operation of equipment with Owner in order to determine problems and tendencies of such.

C. General Service and Maintenance

1. Verify operation of actuators, dampers, coils, fan motors, drives, belts, gas train assemblies, burner assemblies, pilot assemblies, ignition assemblies, sensors, gas valves/regulators, safety switches, limit switches, flues, access doors, flexible duct connections, motor starters, and integral temperature controls.
2. Inspect flexible connections and ductwork for damage and leaks.
3. Inspect tension on drive and fan belts. Adjust tension or change belts as needed.
4. Lubricate fan shaft bearings, motor bearings, dampers, linkage, access doors.
5. Clean air intake screen on motor.
6. Inspect fan wheel for free rotation, cracks, and alignment.
7. Inspect for vibrations and unusual noises.
8. Inspect and clean all coils.
9. Test secureness of guards, doors, and panels.
10. Test air flow switch operation.
11. Inspect all structural elements for corrosion and damage.
12. Test dampers and actuators for proper operation. Adjust dampers and actuators as needed.
13. Inspect and replace all air filters with new 40% efficiency (minimum) type filters.

D. Specialized Service and Maintenance

1. Gas Burners:
 - a) Inspect and clean all combustion/primary air passages.
 - b) Test all burner linkages for secureness and/or damage.
 - c) Test linkage for ease of operation and lubricate as required.
 - d) Remove, clean and inspect nozzles.
 - e) Test secureness of mounting points, and tighten all major points.
 - f) Inspect ignition assembly and electrode and clean if necessary.
 - g) Inspect pilot and clean pilot orifice if necessary.
 - h) Inspect high tension wire for deterioration.
 - i) Inspect and set spark gap.
 - j) Perform combustion test and adjust fuel/air ratio as required.
 - k) Test operation and setting of the gas pressure regulators.
 - l) Inspect for unusual noises, vibrations, odors, etc.
 - m) Inspect flame detector and clean if necessary.
2. DX Evaporator Cooling Coils:
 - a) Inspect coil for leaks or damage.
 - b) Brush and clean coil to remove soil and debris.

PART 3
MECHANICAL SYSTEMS TASKING

3. Programmer:
 - a) Test main and pilot flame failure protection.
 - b) Test signal from flame detector.
 - c) Test flame detector with hot refractory.
 - d) Test minimum pilot function.

4. Motor Starters:
 - a) Inspect wiring for secureness and damage.
 - b) Inspect contactors, terminals, relays, and fuses for signs of wear, arching, overheating, burns, etc.
 - c) Inspect electrical connections for tightness and absence of moisture.
 - d) Measure and record operating voltage and amperage.

E. Reports

1. Provide an electronic typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the operational status and condition of the following equipment:
 - a) Actuators, dampers, coils, heat exchangers, fan motors, drives, belts, gas train assemblies, burner assemblies, pilot assemblies, ignition assemblies, sensors, gas valves/regulators, safety switches, limit switches, flues, air filters motor starters, and integral temperature controls.

2. Provide an electronic typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the operating voltage and amperage of the following equipment:
 - a) Fan motors, and integral controls.

3. Provide an electronic typewritten report or approved form to the Owner upon completion of tasking procedures, confirming any irregular conditions; existing or potential operational problems; and repair requirements if applicable.

F. Schedule

1. Perform tasking procedures 3 times within a calendar year, at 4 month intervals, for the following:
 - a) C. General Service and Maintenance:
 1. Item 13.

2. Perform tasking procedures 2 times within a calendar year, at 6 month intervals, for the following:
 - a) C. General Service and Maintenance:
 1. Items 1 - 12.

3. Perform tasking procedures 1 time within a calendar year, at a 12 month interval, for the following:
 - a) D. Specialized Service and Maintenance:
 1. 1. Gas Burners: Items a - m.
 2. 2. DX Evaporator Cooling Coils: Items a - b.
 3. 3. Programmer: Items a - d.
 4. 4. Motor Starters: Items a - d

PART 3
MECHANICAL SYSTEMS TASKING
SECTION 3.3 - HVAC TEMPERATURE CONTROL SYSTEM

A. Equipment

1. Comprehensive electric, electronic and direct digital control (DDC) HVAC temperature control systems which includes the following components and accessories:
 - a) Facility management systems, operator workstations, computers, computer hardware, modems, computer software, network controllers, application specific controllers (DDC controllers for condensing units, fan coil units, heat pump units, exhaust fans, packaged rooftop HVAC units, packaged self-contained heating and cooling units, unit heaters, variable air volume boxes, variable frequency drives), actuators, dampers, thermostats, thermometers, transmitters, interfaces, transformers, receiver controllers, contactors, switches, safety devices, sensors, control valves, gauges, panels, terminal strips, filters, time clocks, wiring and relays.

B. General Items

1. Check in with Owner Representative.
2. Review submittals and documentation of equipment as provided by Owner. Discuss operation of equipment with Owner in order to determine problems and tendencies of such.

C. General Service and Maintenance

1. Verify operation of HVAC control systems including: facility management systems, operator workstations, computers, computer hardware, modems, computer software, network controllers, application specific controllers (DDC controllers for condensing units, fan coil units, heat pump units, exhaust fans, packaged rooftop HVAC units, packaged self-contained heating and cooling units, unit heaters, variable air volume boxes, variable frequency drives), actuators, dampers, thermostats, thermometers, transmitters, interfaces, transformers, receiver controllers, relays, contactors, switches, safety devices, sensors, control valves, gauges, panels, terminal strips, filters, time clocks, wiring and relays.

D. Specialized Service and Maintenance

1. Facility Management Systems (Comfort Manager, Metasys, Tracer, Tracker, etc.):
 - a) Keep system and controller software current. Assure year 2014 compliance for all DDC systems and controllers by performing any software upgrades and or minor hardware upgrades
 - b) Analyze and report on the performance of the facility management system's network. List diagnostic statistics. Analyze the number of reconfigurations for impact on network performance. Analyze error rate and transmission rate for each network node and determine the performance ratios.
 - c) Review with CMHA current comfort, control, and energy optimization objectives. Analyze implemented control strategies for applicability in achieving CMHA's objectives. Report on control strategy effectiveness and make recommendation for improvement. Assist in the design and implementation of alarm management and reporting strategies.
 - d) Review FMS for all non-standard conditions: alarm, override, disabled, lockout. Review system event log books. Perform corrective maintenance procedures to resolve the non-standard conditions.
 - e) FMS operator workstations (monitor, external surfaces, read/write heads of removable disk drive). Save/Copy workstation data base,

PART 3
MECHANICAL SYSTEMS TASKING

- f) Including graphics and resident controller archive data bases. Cycle power, check for unusual motor/bearing noise. Verify proper system restart, check system date, time and hardware status.
2. Network Controllers (Comfort Manager, Metasys, Tracer, Tracker, etc.):
- a) Keep system and controller software current. Assure year 2014 compliance by performing any minor software and or hardware upgrades.
 - b) Check LED indications to verify proper DC power levels, appropriate Transmit and Receive activity on all trunks, and check for possible error code indications.
 - c) Check wiring for signs of corrosion, fraying and rapid discoloration.
 - d) Remove dust from heat sink surfaces, clean enclosure exterior surfaces.
 - e) Check voltage level of battery sub module.
 - f) Cycle power to initiate self-test diagnostic. Monitor and report results.
 - g) Verify the proper operation of critical control processes and points associated with this unit and make adjustments, if necessary.
3. Control Systems (Condensing Units, Fan Coil Units, Heat Pump Units, Exhaust Fans, Packaged Rooftop HVAC Units, Packaged Self-Contained Heating and Cooling Units, Unit Heaters, Variable Air Volume Boxes, Variable Frequency Drives):
- a) Check and calibrate all controllers and transmitters. Change one set point value; verify smooth transition and stable control at the new set point. Return set point to original value. Repeat for each additional control loop.
 - b) Check and set receiver gages as required.
 - c) Verify the proper operation of critical control processes and points associated with this unit.
 - d) Check all room thermostats and calibrate as required.
4. Central Plant Controllers (Packaged Rooftop HVAC Units):
- a) Check and calibrate all controllers and transmitters. Change one set point value; verify smooth transition and stable control at the new set point. Return set point to original value. Repeat for each additional control loop.
 - b) Check and set receiver gages as required.
 - c) Verify the proper operation of critical control processes and points associated with this unit.

E. Reports

- 1. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the operational status and condition of the following equipment:
 - a). Verify operation of HVAC control systems including: facility management systems, operator workstations, computers, computer hardware, modems, computer software, network controllers, application specific controllers (DDC controllers for condensing units, fan coil units, heat pump units, exhaust fans, packaged rooftop HVAC units, packaged self-contained heating and cooling units, unit heaters, variable air volume boxes, variable frequency drives) , actuators, dampers, thermostats, thermometers, transmitters, interfaces, transformers, receiver controllers, relays, contactors, switches, safety devices, sensors, control valves, gauges, panels, terminal strips, filters, time clocks, wiring and relays.
- 2. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming any irregular conditions; existing or potential operational problems; and repair requirements if applicable.

PART 3
MECHANICAL SYSTEMS TASKING

F. Schedule

1. Perform tasking procedures 2 times within a calendar year, at 6 month intervals, for the following:
 - a) C. General Service and Maintenance:
 1. Item 1.

2. Perform tasking procedures 1 time within a calendar year, at a 12 month interval, for the following:
 - a) D. Specialized Service and Maintenance:
 1. 1. Facility Management Systems: Items a –f.
 2. 2. Network Controllers: Items a – g.
 3. 3. Control Systems: Items a - d.
 4. 4. Central Plant Controllers: Items a – c.

PART 3
MECHANICAL SYSTEMS TASKING

SECTION 3.4 - HEAT PUMP UNITS

A. Equipment

1. Packaged air cooled heat pump units which include the following components and accessories:
 - a) Compressors, condenser coils, condenser fans, motors, crankcase heaters, charging valves, reversing valves, pressure relief valves, temperature/pressure gauges, flow switches, oil pressure switches, low suction pressure switches, high discharge pressure switches, timers, relays, sequencers, unloaders, vibration isolators, integral controls, and motor starters.

B. General Items

1. Check in with Owner Representative.
2. Review submittals and documentation of equipment as provided by Owner. Discuss operation of equipment with Owner in order to determine problems and tendencies of such.

C. General Service and Maintenance

1. Verify operation of coils, compressors, condensers, fan motors, drives, belts, sensors, enthalpy controllers, safety switches, limit switches, reversing valves, control valves, motor starters, and integral temperature controls.
2. Verify refrigerant charge.
3. Test accuracy of all temperature and pressure gauges.
4. Inspect for vibrations and unusual noises in bearings, motors, etc.
5. Inspect moisture indicator for evidence of moisture.
6. Record compressor suction, discharge, and oil pressures.
7. Clean all debris from air inlet louvers and screens.
8. Brush/clean condenser coils to remove soil.
9. Test for secureness of guards, doors, and panels.
10. Inspect all structural elements for corrosion and damage.
11. Inspect tension on drive and fan belts. Adjust tension or change belts as needed.
12. Lubricate fan shaft bearings, motor bearings, dampers, linkage, access doors.
13. Clean air intake screen on motor.
14. Inspect fan wheel for free rotation, cracks, and alignment.
15. Test air flow switch and reversing valve operation.
16. Inspect and test enthalpy controllers. Adjust and calibrate enthalpy controllers as needed.

D. Specialized Service and Maintenance

1. Compressors:
 - a) Inspect vibration eliminators for secureness and damage.
 - b) Test for refrigerant leaks and report results.
 - c) Lubricate motor bearings and couplings.
 - d) Clean air intake screen on motor.
 - e) Inspect motor windings and report condition.
 - f) Check shaft alignment and align such as needed.
 - g) Tighten control terminal connections at heater elements.
 - h) Test secureness of mounting points, and tighten all major points.
2. Condenser Fan Motors:
 - a) Inspect for vibrations and unusual noises in bearings, motors, etc.
 - b) Wipe down and clean motors of loose soil and oil buildup.
 - c) Inspect tension on drive and fan belts. Adjust tension or change belts as needed.
 - d) Inspect fans for vibrations and tightness.

PART 3

MECHANICAL SYSTEMS TASKING

- e) Lubricate motor bearings.
- f) Inspect wiring and connections for signs of wear, overheating, burns, etc.

PART 3
MECHANICAL SYSTEMS TASKING

- g) Inspect all structural elements for corrosion and damage.
- 3. Motor Starters:
 - a) Inspect wiring for secureness and damage.
 - b) Inspect contactors, terminals, relays, and fuses for signs of wear, arcing, overheating, burns, etc.
 - c) Inspect electrical connections for tightness and absence of moisture.
 - d) Measure and record operating voltage and amperage.
- 4. DX Evaporator Cooling Coils:
 - a) Inspect coil for leaks or damage.
 - b) Brush and clean coil to remove soil and debris.

E. Reports

- 1. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the operational status and condition of the following equipment:
 - a) Coils, compressors, condensers, fan motors, drives, belts, safety switches, enthalpy controllers, limit switches, reversing valves, control valves, motor starters, and integral temperature controls.
- 2. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the operating voltage and amperage of the following equipment:
 - a) Fan motors, and integral controls.
- 3. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the suction pressures and discharge pressures for the compressors.
- 4. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming any irregular conditions; existing or potential operational problems; and repair requirements if applicable.

F. Schedule

- 1. Perform tasking procedures 2 times within a calendar year, at 6 month intervals, for the following:
 - a) C. General Service and Maintenance:
 - 1. Items 1 - 16.
- 2. Perform tasking procedures 1 time within a calendar year, at 12 month intervals, for the following:
 - a) D. Specialized Service and Maintenance:
 - 1. 1. Compressors: Items a - h.
 - 2. 2. Condenser Fan Motors: Items a - g.
 - 3. 3. Motor Starters: Items a - d.
 - 4. 4. DX Evaporator Cooling Coils: Items a - b.

PART 3
MECHANICAL SYSTEMS TASKING

SECTION 3.5 - PACKAGED ROOFTOP HVAC UNITS

A. Equipment

1. Packaged gas/electric heating and DX cooling rooftop HVAC units which include the following components and accessories:
 - a) Actuators, dampers, coils, compressors, condensers, heat exchangers, fan motors, bearings, shafts, drives, belts, gas train assemblies, burner assemblies, pilot assemblies, ignition assemblies, gas valves/regulators, safety switches, limit switches, sensors, enthalpy controllers, access doors, air filters, flexible duct connections, curbs, vibration isolators, motor starters, and integral temperature controls.

B. General Items

1. Check in with Owner Representative.
2. Review submittals and documentation of equipment as provided by Owner. Discuss operation of equipment with Owner in order to determine problems and tendencies of such.

C. General Service and Maintenance

1. Verify operation of actuators, dampers, coils, compressors, condensers, fan motors, drives, belts, gas train assemblies, burner assemblies, pilot assemblies, ignition assemblies, sensors, enthalpy controllers, gas valves/regulators, safety switches, limit switches, motor starters, and integral temperature controls.
2. Verify refrigerant charge.
3. Test accuracy of all temperature and pressure gauges.
4. Inspect for vibrations and unusual noises in bearings, motors, etc.
5. Inspect moisture indicator for evidence of moisture.
6. Record compressor suction, discharge, and oil pressures.
7. Clean all debris from air inlet louvers and screens.
8. Brush/clean condenser coils to remove soil.
9. Test for secureness of guards, doors, and panels.
10. Inspect all structural elements for corrosion and damage.
11. Inspect flexible connections and ductwork for damage and leaks.
12. Inspect tension on drive and fan belts. Adjust tension or change belts as needed.
13. Lubricate fan shaft bearings, motor bearings, dampers, linkage, access doors.
14. Clean air intake and outlet screens on motor, fan wheel and housing.
15. Inspect fan wheel for free rotation, cracks, and alignment.
16. Test air flow switch operation.
17. Test dampers and actuators for proper operation. Adjust dampers and actuators as needed.
18. Inspect and test enthalpy controllers. Adjust and calibrate enthalpy controllers as needed.
19. Inspect and test condensate drain for proper operation.
20. Inspect and replace all disposable air filters with new 40% efficiency (minimum) type filters.

D. Specialized Service and Maintenance

1. Electric Heating Coils:
 - a) Inspect coil for damage to element.
 - b) Inspect isolators for damage or cracks.
 - c) Brush and clean coil to remove soil and debris.
 - d) Torque heating terminals as required for secureness.
 - e) Verify staging of heating elements.
2. DX Condensing and Evaporator Cooling Coils:
 - a) Inspect coil for leaks or damage.
 - b) Brush and clean coil to remove soil and debris.

PART 3
MECHANICAL SYSTEMS TASKING

3. Gas Burners:
 - a) Inspect and clean all combustion/primary air passages.
 - b) Test all burner linkages for secureness and/or damage.
 - c) Test linkage for ease of operation and lubricate as required.
 - d) Remove, clean and inspect nozzles.
 - e) Test secureness of mounting points, and tighten all major points.

 - f) Inspect ignition assembly and electrode and clean if necessary.
 - g) Inspect pilot and clean pilot orifice if necessary.
 - h) Inspect high tension wire for deterioration.
 - i) Inspect and set spark gap.
 - j) Perform combustion test and adjust fuel/air ratio as required.
 - k) Test operation and setting of the gas pressure regulators.
 - l) Inspect for unusual noises, vibrations, odors, etc.
 - m) Inspect flame detector and clean if necessary.
 - n) Test main and pilot flame failure protection.
 - o) Test signal from flame detector.
 - p) Test flame detector with hot refractory.
 - q) Test minimum pilot function.

4. Compressors:
 - a) Verify oil level in compressor. Draw oil sample for analysis and test for acid. Change oil and filter element in response to analysis.
 - b) Inspect vibration eliminators for secureness and damage.
 - c) Test for refrigerant leaks and report results.
 - d) Lubricate motor bearings and couplings.
 - e) Clean air intake screen on motor.
 - f) Inspect motor windings and report condition.
 - g) Check shaft alignment and align such as needed.
 - h) Tighten control terminal connections at heater elements.
 - i) Test secureness of mounting points, and tighten all major points.

5. Condenser Fan Motors:
 - a) Inspect for vibrations and unusual noises in bearings, motors, etc.
 - b) Wipe down and clean motors of loose soil and oil buildup.
 - c) Inspect tension on drive and fan belts. Adjust tension or change belts as needed.
 - d) Inspect fans for vibrations and tightness.
 - e) Lubricate motor bearings.
 - f) Inspect wiring and connections for signs of wear, overheating, burns, etc.
 - g) Inspect all structural elements for corrosion and damage.

6. Motor Starters:
 - a) Inspect wiring for secureness and damage.
 - b) Inspect contactors, terminals, relays, and fuses for signs of wear, arcing, overheating, burns, etc.
 - c) Inspect electrical connections for tightness and absence of moisture.
 - d) Measure and record operating voltage and amperage.

E. Reports

1. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the operational status and condition of the following equipment:
 - a) Actuators, dampers, coils, heat exchangers, compressors, condensers, fan motors, drives, belts, gas train assemblies, burner assemblies, pilot assemblies, ignition assemblies, sensors, enthalpy controllers, gas valves/regulators, safety switches, limit switches, air filters, motor starters, and integral temperature controls.

PART 3
MECHANICAL SYSTEMS TASKING

2. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the operating voltage and amperage of the following equipment:
 - a) Fan motors, and integral controls.
3. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the oil sample analysis and oil pressure from the compressors.
4. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the suction pressures and discharge pressures for the compressors.
5. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming any irregular conditions; existing or potential operational problems; and repair requirements if applicable.

F. Schedule

1. Perform tasking procedures 3 times within a calendar year, at 4 month intervals, for the following:
 - a) C. General Service and Maintenance:
 1. Item 20.
2. Perform tasking procedures 2 times within a calendar year, at 6 month intervals, for the following:
 - a) C. General Service and Maintenance:
 1. Items 1 - 19.
3. Perform tasking procedures 1 time within a calendar year, at a 12 month interval, for the following:
 - a) D. Specialized Service and Maintenance:
 1. 1. Electric Heating Coils: Items a - e.
 2. 2. DX Condensing and Evaporator Cooling Coils: Items a - b.
 3. 3. Gas Burners: Items a - q.
 4. 4. Compressors: Items a - i.
 5. 5. Condenser Fan Motors: Items a - g.
 6. 6. Motor Starters: Items a - d.

PART 3
MECHANICAL SYSTEMS TASKING

SECTION 3.6 - PACKAGED SELF-CONTAINED HEATING AND COOLING UNITS

A. Equipment

1. Packaged electric heating and DX cooling HVAC units which include the following components and accessories:
 - a) Actuators, dampers, coils, compressors, condensers, fan motors, drives, belts, sensors, enthalpy controllers, safety switches, limit switches, filter racks, air filters, motor starters, and integral temperature controls.

B. General Items

1. Check in with Owner Representative.
2. Review submittals and documentation of equipment as provided by Owner. Discuss operation of equipment with Owner in order to determine problems and tendencies of such.

C. General Service and Maintenance

1. Verify operation of actuators, dampers, coils, compressors, condensers, fan motors, drives, belts, sensors, enthalpy controllers, safety switches, limit switches, motor starters, and integral temperature controls.
2. Verify refrigerant charge.
3. Test accuracy of all temperature and pressure gauges.
4. Inspect for vibrations and unusual noises in bearings, motors, etc.
5. Inspect moisture indicator for evidence of moisture.
6. Record compressor suction, discharge, and oil pressures.
7. Clean all debris from air inlet louvers and screens.
8. Brush/clean condenser coils to remove soil.
9. Test for secureness of guards, doors, and panels.
10. Inspect all structural elements for corrosion and damage.
11. Inspect flexible connections and ductwork for damage and leaks.
12. Inspect tension on drive and fan belts. Adjust tension or change belts as needed.
13. Lubricate fan shaft bearings, motor bearings, dampers, linkage, access doors.
14. Clean air intake screen on motor.
15. Inspect fan wheel for free rotation, cracks, and alignment.
16. Test air flow switch operation.
17. Test dampers and actuators for proper operation. Adjust dampers and actuators as needed.
18. Inspect and test enthalpy controllers. Adjust and calibrate enthalpy controllers as needed.
19. Inspect and test condensate drain for proper operation.
20. Inspect and replace all disposable air filters with new 40% efficiency (minimum) type filters.

D. Specialized Service and Maintenance

1. Electric Heating Coils:
 - a) Inspect coil for damage to element.
 - b) Inspect isolators for damage or cracks.
 - c) Brush and clean coil to remove soil and debris.
 - d) Torque heating terminals as required for secureness.
 - e) Verify staging of heating elements.
2. DX Evaporator and Condensing Cooling Coils:
 - a) Inspect coil for leaks or damage.
 - b) Brush and clean coil to remove soil and debris.
3. Compressors:
 - a) Inspect vibration eliminators for secureness and damage.
 - b) Test for refrigerant leaks and report results.
 - c) Lubricate motor bearings and couplings.
 - d) Clean air intake screen on motor.

PART 3
MECHANICAL SYSTEMS TASKING

- e) Inspect motor windings and report condition.
 - f) Check shaft alignment and align such as needed.
 - g) Tighten control terminal connections at heater elements.
 - h) Test secureness of mounting points, and tighten all major points.
4. Condenser Fan Motors:
- a) Inspect for vibrations and unusual noises in bearings, motors, etc.
 - b) Wipe down and clean motors of loose soil and oil buildup.
 - c) Inspect tension on drive and fan belts. Adjust tension or change belts as needed.
 - d) Inspect fans for vibrations and tightness.
 - e) Lubricate motor bearings.
 - f) Inspect wiring and connections for signs of wear, overheating, burns, etc.
 - g) Inspect all structural elements for corrosion and damage.
5. Motor Starters:
- a) Inspect wiring for secureness and damage.
 - b) Inspect contactors, terminals, relays, and fuses for signs of wear, arcing, overheating, burns, etc.
 - c) Inspect electrical connections for tightness and absence of moisture.
 - d) Measure and record operating voltage and amperage.

E. Reports

1. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the operational status and condition of the following equipment:
 - a) Actuators, dampers, coils, compressors, condensers, fan motors, drives, belts, sensors, enthalpy controllers, safety switches, limit switches, air filters, motor starters, and integral temperature controls.
2. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the operating voltage and amperage of the following equipment:
 - a) Fan motors, and integral controls.
3. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the suction pressures and discharge pressures for the compressors.
4. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming any irregular conditions; existing or potential operational problems; and repair requirements if applicable.

F. Schedule

1. Perform tasking procedures 3 times within a calendar year, at 4 month intervals, for the following:
 - a) C. General Service and Maintenance:
 1. Item 20.
2. Perform tasking procedures 2 times within a calendar year, at 6 month intervals, for the following:
 - a) C. General Service and Maintenance:
 1. Items 1 - 19.
3. Perform tasking procedures 1 time within a calendar year, at 12 month intervals, for the following:
 - a) D. Specialized Service and Maintenance:
 1. 1. Electric Heating Coils: Items a - e.
 2. 2. DX Condensing and Evaporator Cooling Coils: Items a - b.

PART 3
MECHANICAL SYSTEMS TASKING

3. 3. Compressors: Items a - h.
4. 4. Condenser Fan Motors: Items a - g.
5. 5. Motor Starters: Items a - d.

**PART 3
MECHANICAL SYSTEMS TASKING**

SECTION 3.7 – REFRIGERANT/FILTERS

A. Equipment

1. Type R22, R134a, R-410a and/or similar refrigerant.

B. General Items

1. Check in with Owner Representative.
2. Review submittals and documentation of equipment as provided by Owner. Discuss operation of equipment with Owner in order to determine problems and tendencies of such.

C. General Service and Maintenance

1. Inspect, test and provide all necessary refrigerant utilized in the systems for the following equipment items:
 - a) Condensing Units
 - b) Fan Coil Units
 - c) Heat Pump Units
 - d) Packaged Rooftop HVAC Units
 - e) Packaged Self-Contained HVAC Units
2. All refrigerant and refrigerant replacement shall be installed and reclaimed in accordance with equipment manufacturers recommendations and local codes.
3. Provide all necessary refrigerant reclaim machines and devices.
4. Provide labor to install, extract, contain, move, or handle all refrigerant.
5. Provide and maintain all necessary safety procedures associated with the refrigerant and its handling.

D. Reports

1. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the type, condition, and quantity of refrigerant utilized in the systems for the following equipment:
 - a) Condensing Units
 - b) Fan Coil Units
 - c) Heat Pump Units
 - d) Packaged Rooftop HVAC Units
 - e) Packaged Self-Contained HVAC Units
2. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming any irregular conditions; existing or potential operational problems: and repair requirements if applicable.

E. Schedule

1. Perform tasking procedures 1 time within a calendar year, at a 12 month interval, for the following:
 - a) C. General Service and Maintenance:
 1. Items 1- 5.

PART 3
MECHANICAL SYSTEMS TASKING

SECTION 3.8 - VARIABLE FREQUENCY DRIVES

A. Equipment

1. Electric variable frequency drives which include the following components and accessories:
 - a) Panels, configuration cards, controllers, inductors, RFI filters, relays, contactors, microprocessors, keypads, timers, wiring, and integral controls.

B. General Items

1. Check in with Owner Representative.
2. Review submittals and documentation of equipment as provided by Owner. Discuss operation of equipment with Owner in order to determine problems and tendencies of such.

C. General Service and Maintenance

1. Verify operation of controllers, inductors, RFI filters, relays, contactors, microprocessors, timers, and integral controls.
2. Check for unusual noises, arcing, burns, etc.
3. Inspect and clean VFD cabinet and housing.
4. Verify start/stops, overrides, status, and speed control (reference temperature control points, variable speed drive wiring details)
5. Verify the given input of the VFD with the expected output.
6. Verify system operation through Metasys or other DDC automated facility management system.
7. Perform an inductance test.
8. Test input/output voltages and input/output current.
9. Provide all necessary metering and testing devices.

D. Reports

1. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the operational status and condition of the following equipment:
 - a) Panels, configuration cards, controllers, inductors, RFI filters, relays, contactors, microprocessors, keypads, timers, wiring, and integral controls.
2. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming the input/output voltages and input/output current of the variable frequency drives.
3. Provide a typewritten report or approved form to the Owner upon completion of tasking procedures, confirming any irregular conditions; existing or potential operational problems; and repair requirements if applicable.

E. Schedule

1. Perform tasking procedures 2 times within a calendar year, at 6 month intervals, for the following:
 - a) C. General Service and Maintenance:
 1. Items 1- 9.

PART 4 – MECHANICAL EQUIPMENT INVENTORIES

**PART 4
MECHANICAL EQUIPMENT INVENTORY**

SECTION 4.0 - CMHA ANNEX

A. Condensing Units

1. Description: Condensing Unit (CU-1)
Quantity: 1
Location: Exterior – East Side of Building
Manufacturer: Lennox

2. Description: Condensing Unit (CU-2)
Quantity: 1
Location: Exterior – East Side of Building
Manufacturer: Lennox
Model Number: HS29-060-13Y
Serial Number: 5806J22778
Motor Horsepower: -
Accessories: -

3. Description: Condensing Unit (CU-3)
Quantity: 1
Motor Horsepower: -
Accessories: -

4. Description: Condensing Unit (CU-4)
Quantity: 1
Location: Exterior – East Side of Building
Manufacturer:
Model Number:
Serial Number:
Motor Horsepower: -
Accessories: -
Remarks:

5. Description: Condensing Unit (CU-5)
Quantity: 1
Location: Exterior – East Side of Building
Manufacturer: EMI
Model Number: SHC18DF000AAOA
Serial Number: 1-03-D-8012-17
Motor Horsepower: -
Accessories: -
Remarks: Nominal 18,000 BTUH (1.5 ton) cooling capacity, 208 volt, 1 phase, 10.3 MCA, 15.0 MOCP.

B. Fan Coil Units

1. Description: Fan Coil Unit (FC)
Quantity: 1
Location: -
Manufacturer: EMI
Model Number: -
Serial Number: -
Motor Horsepower: -
Accessories: -
Remarks: Nominal 18,000 BTUH (1.5 ton) cooling capacity, 208 volt, 1 phase, 10.3 MCA, 15.0 MOCP.

C. Furnaces

1. Description: Gas-Fired Furnace
Quantity: 4
Location: Indoors
Manufacturer:

PART 4
MECHANICAL EQUIPMENT INVENTORY

Model Number: -
Serial Number: -
Motor Horsepower: -
Accessories: -
Remarks: Condensing type, vertical upflow style, 90% AFUE.

D. HVAC Temperature Control Systems

1. Description: Electric and Electronic. Quantity: Numerous
Location: Throughout building
Manufacturer: -
Model Number: -
Serial Number: -
Motor Horsepower: -
Accessories: -
Remarks: Includes control cabinets, sensors, thermostats, relays, wiring, switches, transformers, etc. serving furnaces, fan coil units, condensing units and exhaust fans.

SECTION 4.0 - CMHA CENTRAL OFFICE

A. HVAC Temperature Control Systems (METASYS)

1. Description: Electric, Electronic and DDC. Quantity: Numerous
Location: Throughout building
Manufacturer: -
Model Number: -
Serial Number: -
Motor Horsepower: -
Accessories: -
Remarks: Includes facility management systems, operator workstations, computers, computer hardware, modems, computer software, control cabinets, controllers, sensors, thermostats, relays, wiring, switches, transformers, etc. serving condensing units, packaged self-contained heating and cooling units, packaged rooftop HVAC units, variable air volume (VAV) boxes, variable frequency drives, exhaust fans and unit heaters.

B. Packaged Rooftop HVAC Units

1. Description: Rooftop HVAC Unit (RTU-1) Quantity: 1
Location: Roof
Manufacturer: JCI/YORK (SEE ATTACHED ROOF TOP UNIT)
Model Number:
Serial Number:
Motor Horsepower:
Accessories: VAV Controller, variable frequency drive, manual bypass, 50% exhaust system.
Remarks: Gas heating 1000 MBH input, 820 MBH output, electric cooling 1560.8 MBH total cooling capacity, 1092.MBH sensible cooling capacity, 46,000 CFM, 2.0/3.5" ESP, 480 Volt, 3 Phase.

C. Packaged Self-Contained Heating and Cooling Units

1. Description: Self Contained Heating / Cooling Unit (EV-1/EV-2) Quantity: 2

PART 4

MECHANICAL EQUIPMENT INVENTORY

Location: Third floor- Mainframe Rm. #318
Manufacturer: Liebert
Model Number: MMD36
E-PHEDO Serial Number: -
Motor Horsepower: -
Accessories: Electric reheat, -30°F head pressure control, condensate pump, switchover panel, remote condensing unit.
Remarks: 33.20 MBH total cooling, 26.90 MBH sensible cooling, 26.90 MBH total heating capacity, 208 Volt, 3 Phase, nominal 3 tons cooling.

D. Variable Frequency Drives

1. Description: Variable Frequency
Drive (VFD) Quantity: 1
Location: Roof
Manufacturer:
Model Number: -
Serial
Number: -
Motor
Horsepower: -
Accessories: -
Remarks: Integral of rooftop HVAC unit RTU-1.

PART 4
MECHANICAL EQUIPMENT INVENTORY

PART 4
MECHANICAL EQUIPMENT INVENTORY

PART 4
MECHANICAL EQUIPMENT INVENTORY

PART 4
MECHANICAL EQUIPMENT INVENTORY