

**HVAC Maintenance Services**  
**for Sewerage and Drainage Facilities FEM Project No. 1503.2**  
**EXHIBIT “A” SCOPE OF SERVICES**

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**PART 1            GENERAL**

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1.01            DESCRIPTION.

The City of Columbus, Ohio, Division of Sewerage and Drainage (DOSD) presently operates two wastewater treatment plants; the Southerly Wastewater Treatment Plant, located at 6977 S. High Street, Lockbourne, Ohio 43137 and the Jackson Pike Wastewater Treatment Plant, located at 2104 Jackson Pike, Columbus, Ohio 43223. Located upstream of the Jackson Pike WWTP within the confines of the City’s Berliner Park is the Trucked Waste Disposal Facility, located at 1600 Deckenbach Road, Columbus, Ohio 43223. The DOSD also operates the Southwesterly Compost Facility, located at 7000 Jackson Pike, Lockbourne, Ohio 43137. These facilities are equipped with various styles and sizes of HVAC air handling equipment. This contract is designated to accomplish the following objectives:

- A.    Optimize the economical performance of the plants’ air handling equipment by regularly monitoring the performance of the HVAC systems and performing routine scheduled service to each unit.
- B.    Increase reliability and extend equipment life expectancy through implementation of a comprehensive preventive maintenance program.
- C.    Reduce Division manpower demands for technical service personnel by providing trained personnel to perform and administer all HVAC system monitoring, preventive and corrective maintenance, and repairs as directed.

1.02            EXPERIENCE.

The indoor environments in the various buildings of the wastewater treatment plants are required to be environmentally stable to ensure the reliable continuous 24-hour a day uninterrupted operation of the electronic control systems and associated computer hardware that monitor the crucial functions of the wastewater treatment processes. It is also necessary to protect these expensive and sensitive electronics from temperature extremes and provide a safe, habitable environment for plant personnel performing associated operations and maintenance work in the vicinity. Therefore, it is extremely important that the maintenance service for the plants’ HVAC equipment be provided by an organization experienced in HVAC system maintenance, testing and repair. The Contractor must:

- A. Have access to equipment capable of use in performing all of the required HVAC system testing and preventive maintenance.
- B. Have adequate warehousing space for storage of refrigerant, testing equipment, particulate filters, drive belts, fuses, grease, bearings, and all other preventive and corrective maintenance supplies for HVAC equipment.
- C. Have sufficient manpower and qualified staff to effectively perform the required preventive maintenance and testing within an acceptable time frame. The work shall be performed by a qualified technician, who is defined as a person, by possession of a recognized degree in an applicable field, or by certificate of professional standing, or who by extensive knowledge, training, and experience has demonstrated the ability to accomplish the work described in these specifications.
- D. At all times while performing duties adhere to all rules of the particular industry with regard to mandates by the Environmental Protection Agency (EPA) and/or the Occupational Safety and Health Administration (OSHA) and any other regulation applicable to the circumstances.
- E. Take special note that the Southerly Wastewater Treatment Plant, the Jackson Pike Wastewater Treatment Plant, the Compost Facility and the Trucked Waste Disposal Site are operating facilities. The Contractor shall arrange its work as to avoid any interference with operational processes.
- F. Maintain a clean and safe work area. All debris and trash shall be removed at least at the end of each work day by the Contractor at its own expense. Any debris found abandoned by the Contractor may be removed by the City at the Contractor's expense.

#### 1.03 APPLICABLE STANDARDS.

All work performed shall be done in strict compliance with the following:

- A. NEC (National Electric Code)
- B. UL (Underwriters Laboratories, Inc.) Class I, flammability only
- C. OSHA (Occupational Safety and Health Administration)
- D. NFPA (National Fire Protection Association)
- E. EPA (Environmental Protection Agency)

#### 1.04 REQUIRED SUBMITTALS.

- A. Product Data for all particulate filters including prefilters and afterfilters. Product data should include:
  1. Manufacturer's literature, catalog data and illustrations, specifications and engineering data including dimensions and materials.

2. Installation, startup and operational information.
- B. Product Data for all replacement parts and refrigerants. Product data should include:
  1. Manufacturer's literature including specifications and descriptions.
  2. Installation, startup and operational information.
- C. Qualifications of any testing laboratory to be used in this contract.
- D. Typical Monthly Report – City will review format and content.
- E. Sample Preventive Maintenance Record/Checklist - City will review format and content.
- F. Qualifications of Qualified Technician to perform work.
- G. Product Data for all performance testing equipment. Product data should include:
  1. Manufacturer's literature and specifications.
  2. Operating and maintenance instructions.

#### 1.05 PROJECT MEETINGS.

- A. Attendance at Project Meetings by the Contractor is mandatory.
- B. Project Meetings shall be scheduled on an as-needed basis.
- C. The Contractor shall be provided with a minimum of one week notice.
- D. Project Meetings can occur at the request of the City or the Contractor.

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## **PART 2 PRODUCTS**

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#### 2.01 PARTICULATE FILTERS, PREFILTERS AND AFTERFILTERS.

All manufacturers' recommended particulate filters, including prefilters and afterfilters, as outlined in the HVAC equipment manufacturers' Maintenance and Operations (M&O) manuals, shall be provided by the Contractor.

#### 2.02 REPLACEMENT PARTS AND REFRIGERANT.

All replacement parts and refrigerant provided shall be the HVAC equipment manufacturers' recommended versions, or approved equals. Technical data

sufficient for a comprehensive product comparison of alternate products must be submitted with the bid in order for that bid to be considered. The Contractor may not substitute any type of replacement parts or refrigerant without express written permission from the City. Examples of some of the required types of refrigerant and replacement parts are as follows:

- A. Refrigerant
- B. Fuses
- C. Greases
- D. Drive Belts. Drive belts specified by the manufacturer of the HVAC are the only replacements that will be considered for use in this contract. At no time will link-style temporary belts be acceptable for incorporation into the plants' HVAC equipment.
- E. Bearings
- F. Compressor Oil

## 2.03 PREVENTIVE MAINTENANCE.

Preventive maintenance, including all required materials and supplies, is required monthly on every HVAC unit. The Contractor shall provide all necessary labor, equipment, replacement parts, materials and supplies to perform all manufacturers' recommended preventive maintenance, as directed in the manufacturers' Maintenance and Operations (M&O) manuals, on the HVAC equipment as listed in Appendices A and C.

- A. A Preventive Maintenance Record/Checklist for each HVAC unit shall be maintained and displayed in plastic page protectors fastened to a clipboard hung at each HVAC unit's location. The Contractor shall update each Preventive Maintenance Record/Checklist the same day that service is performed to indicate every preventive maintenance procedure performed on that unit.
- B. Preventive maintenance, in accordance with manufacturers' Maintenance and Operations (M&O) manuals' recommendations, shall include, but not be limited to, the following typical tasks:
  - 1. Monthly general inspections of all HVAC equipment.
  - 2. Monthly lubrication of bearings on motors, fans and dampers.
  - 3. Monthly checking and adjusting of drive belt tension.
  - 4. Monthly cleaning of each unit (removal of foreign matter from grille work, fins, coils, internal components, external areas, etc.).

5. Monthly change-out of all particulate filters.
6. Monthly testing of indoor temperature and humidity.
7. Monthly topping off of refrigerant level if necessary
8. Annual condenser coil deep cleaning.

#### 2.04 PERFORMANCE TESTING.

The Contractor shall provide all necessary portable testing equipment to be able to accurately assess the performance of all plant HVAC units.

##### A. HVAC UNIT TEST PROCEDURES. Examples of HVAC unit test procedures are as follows:

###### 1. Test Procedure A. ELECTRICAL SYSTEM

- a. Check voltages – L1-L2; L1-L3; L2-L3 - monthly
- b. Check amperage – Main Fan Motor – monthly
- c. Check amperage – Condenser Fan Motor – semi-annually
- d. Check amperage – Compressor – semi-annually
- e. Check electrical connections – semi-annually
- f. Check operation sequence – semi-annually

###### 2. Test Procedure B. TEMPERATURE CONTROL SYSTEM

- a. Check temperature control system - monthly
- b. Check room temperature - monthly
- c. Check room humidity - monthly

###### 3. Test Procedure C. COMPRESSOR SECTION

- a. Check oil levels (if applicable) - monthly

###### 4. Test Procedure D. REFRIGERATION SECTION

- a. Check for moisture (sight glass) – monthly
- b. Check suction pressure – semi-annually
- c. Check head pressure – semi-annually
- d. Check discharge pressure – semi-annually

#### 2.05 MONTHLY REPORT.

Monthly Reports on preventive maintenance, testing and filter replacement shall be issued to the City by the Contractor. The Contractor shall submit a report for each facility to the City on the 15th of every month (or another date mutually agreeable to both parties as determined in the planning session). The report shall include a table of contents, all pages to be numbered, and the following:

- A. List of performance tests performed during the past month, including a complete list of the results from each specific unit that was tested.
- B. Report on each unit serviced along with room temperature and humidity observations and recommendations for improvements or adjustments.
- C. List of items requiring immediate attention. The Contractor shall notify the Plant and the City's Project Manager at once of any conditions that are in need of repairs which are discovered during the performance of the work.

## 2.06 CORRECTIVE MAINTENANCE.

### A. CORRECTIVE MAINTENANCE PROCEDURE

Based upon Monthly Report findings, the City may request that the Contractor perform necessary corrective maintenance on the HVAC units that is beyond the scope of preventive maintenance. If such a request is made, the City will issue a request for proposal (RFP) in accordance with the Specification Section 00 70 00, SP-107 Changes in Work.

1. Pricing for such RFP shall not include any separate costs for transportation to the work site or vehicle expenses.
2. Pricing for repair parts will be invoiced at Contractor's cost plus a proposed mark-up, as shall be indicated in the Proposal section (Section 00 40 00). A copy of the Contractor's invoice for parts over \$100.00 must be sent to the Project Manager.
3. All work shall be warranted for one year in accordance with Section 00 70 00, SP-113 Warranty.

### B. ON-SITE CORRECTIVE MAINTENANCE

1. When a condition has been identified that requires immediate corrective maintenance, the Contractor must alert plant personnel immediately. If this is the case, plant personnel may direct the Contractor to submit a proposal for corrective maintenance immediately to the Plant, following the pricing guidelines established in 2.06A.1.&2. above, for immediate consideration. At that time the plant personnel may direct corrective repairs to commence immediately, or may direct the Contractor to instead submit the proposal to the Project Manager for authorization.

### C. CORRECTIVE MAINTENANCE ITEMS

Replacement of the following items is generally considered to be corrective maintenance:

1. Bearings

2. Fuses
3. Refrigerant (in amounts that are considered more than "topping off")
4. Compressors
5. Compressor Oil
6. Belts
7. Fans
8. Motors
9. Electrical Circuit Boards
10. Differential Pressure Gauges
11. Quartz Lamps in HVAC Unit Dehumidifiers

## 2.07 EMERGENCY REPAIRS

The Contractor will provide both wastewater treatment plants' maintenance personnel with 24-hour phone numbers that will be answered without fail in the event of a situation where repairs are immediately necessary. Response to an emergency repair request shall be within two hours (one hour during normal work hours).

1. Pricing for this service will be billed at a fixed hourly rate.
2. Pricing shall include 0.5 hours travel time maximum per visit.
3. If a premium rate will be applied to service required beyond normal working hours, it must be stated on the proposal page (Section 00 40 00). Normal working hours will be 7:30 A.M. to 4:00 P.M. on all weekdays except Christmas, Thanksgiving, New Year's Day, Memorial Day, President's Day and Independence Day.

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## **PART 3                      EXECUTION**

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### 3.01 REFRIGERANT AND FILTER CHANGE-OUT PROCEDURES.

There are two (2) primary types of HVAC units in operation at the Division's wastewater treatment plants. One type is a wall mount system consisting of a self-contained heat exchanger and air handler. The other primary type is a split system consisting of an external heat exchanger connected by external refrigerant hosing to a set of coils internal to the air handler. The split system

can be either air- or water-cooled. The Contractor shall follow the refrigerant and filter change-out procedures detailed below for each type of system:

A. WALL MOUNT SYSTEM. The Contractor shall:

1. Make arrangements with Plant for shutdown of equipment;
2. Deliver new refrigerant and filters to site;
3. Remove covers and access refrigerant piping;
4. Refill new refrigerant into system;
5. Inspect and replace gasketing as needed;
6. Replace all particulate filters and clean ALL grille work, fins, coils, internal components, and external areas;
7. Perform other associated preventive maintenance to unit.

B. SPLIT SYSTEM – AIR- OR WATER-COOLED. The Contractor shall:

1. Make arrangements with Plant for shutdown of equipment;
2. Deliver new refrigerant and filters to site;
3. Remove covers and access refrigerant piping;
4. Refill new refrigerant into system;
5. Inspect and replace gasketing as needed;
6. Replace all particulate filters and clean ALL grille work, fins, coils, internal components, and external areas;
7. Perform other associated preventive maintenance to unit.

C. STARTUP AND MONITORING.

Upon completion of the above, the Contractor will restart and monitor the HVAC unit for proper operation. The area around the unit will be cleaned and all debris and used filters will be suitably packaged and removed by the Contractor to be disposed of at the Contractor's expense.

D. SERVICE REPORT.

The monthly report for each wastewater treatment plant, described in Part 2.05 above, shall include a list of all HVAC units serviced, details of all refrigerant and filter change-out work completed on each unit serviced, together with any observations such as recommendations for other maintenance required to maintain each system in optimum operating condition.



3.02

**ADEQUATE SUPPLIES.**

The Contractor shall have on hand adequate quantities of the proper refrigerant, particulate filters and other parts and shall ensure that the proper type and sized parts are used for each individual HVAC unit. The Contractor shall be responsible for storing the filters, parts and refrigerant off-site and for scheduling and delivering the replacement material to its point of use on an "as-needed" basis. The City will not pay for any refrigerant, replacement parts or particulate filters until they have been installed in an HVAC unit.

### 3.03 SERVICES PROVIDED BY WASTEWATER TREATMENT PLANTS.

Services provided by the wastewater treatment plants shall include the following:

- A. A designated Contact Person within the facility to instruct the Contractor on the proper shut-down and start-up procedure of each HVAC unit. The Plant Contact Person shall also be available if needed to provide assistance during start-up of any equipment or to monitor and/or witness any testing programs;
- B. Access to the facility and to the HVAC units for the Contractor's employees and a service truck;
- C. 110-volt single-phase power within fifty (50) feet of all HVAC units for operation of HVAC testing equipment and tools;
- D. Any other available information for all related Plant HVAC units.

### 3.04 SAMPLING, TESTING AND INSPECTION.

The City reserves the right to inspect any and all work being performed by the Contractor and to have all test results verified by an independent testing laboratory.

### 3.05 DELIVERY AND PACKAGING.

- A. Delivery of any equipment, materials, supplies, etc. for the HVAC Specialty Maintenance Services contract shall be at the expense of the Contractor.
- B. All equipment and materials shall be packaged in standard packaging materials designed to protect from physical damage during shipment. The Contractor is responsible for acceptance and safe delivery of product.
- C. All shipments must be clearly labeled with the following: Contractor Company Name, Shipping Address, Contract or Purchase Order Number, Contractor Representative's Name and Contractor Representative's Telephone Number.
- D. The City will not accept any deliveries of any materials. The Contractor must be on site to accept all deliveries.

++END OF SECTION++