

# Statement of Work

Project Name: SPS Duct Cleaning

Project Number: 528-19-s23

## General Specifications for the Cleaning of Sterile Processing Services (SPS) Heating, Ventilating & Air Conditioning (HVAC) System

### *Location*

Services performed under this scope will be for and conducted in part at the VA Western New York Healthcare System (VAWNYHS), Buffalo VA Medical Center (VAMC) located at 3495 Bailey Avenue, Buffalo, NY 14215.

### *Background*

In Sterile Processing Service (SPS), both the air changes and room pressure differences need to be optimized for an upcoming project. The buildup of dirt and debris in the HVAC ductwork, Air Handling Units (AHU), Reheat Coils and Exhaust Fans does affect how well the system is able to maintain the critical factors for this area. This area is one of the dirtiest and cleanest in any hospital, which is explained below.

### *Purpose*

The intent of this effort is to prepare the system for an investigative by a NEBB certified airflow testing firm. The study will be used to optimize the system during a project to upgrade the equipment and layout of the space.

### *Scope of Work*

Refer to scope under 2.01 for standard detailed requirements. The SPS area is located on the 3<sup>rd</sup> floor in C-wing. Additional considerations for work in this area are:

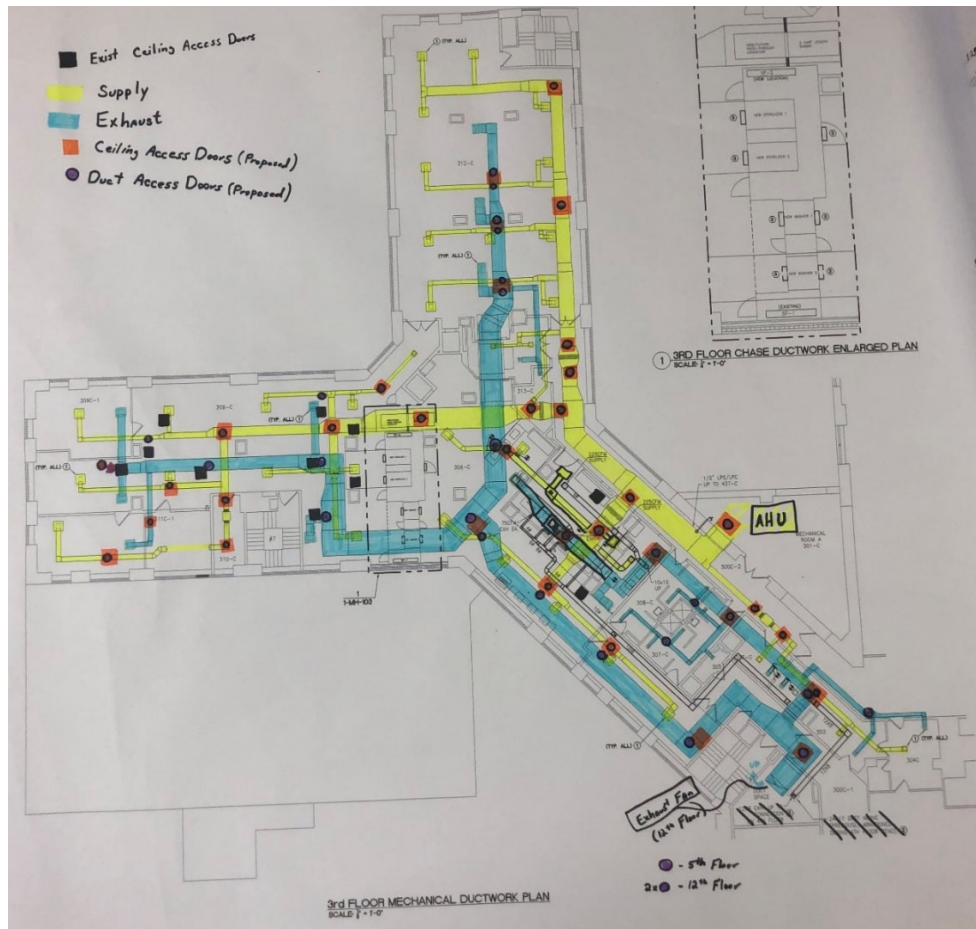
Work Dates – Hospital shutdown of the area will be over the Columbus Day weekend from Friday, October 11, 2019 to Sunday, October 13, 2019. The execution effort will start after **10AM Friday** (see Infection Control below) to end no later than **10AM Sunday** with area clear of personnel and equipment. VA expectation is 4 shifts (day/evening-day/evening). Work shall proceed until completion.

Infection Control - many spaces, fixed desks and equipment will need to be sealed with plastic sheeting and tape to keep the work areas separated. Infection control inspection and confirmation is required from the VA prior to starting access door or duct cleaning work.

Cleaning Method – Contact brush cleaning of the supply side is REQUIRED. Access doors through hard ceiling and access doors into ductwork are part of the scope (see Access Door Preliminary Plan). Use contact brush cleaning of the return side as much as possible. Vertical exhaust shaft from 3<sup>rd</sup> floor to 12<sup>th</sup> floor is only safely accessible from either end (See Decontamination Room below).

Decontamination Room – this room requires that anyone in the area be fully suited up in the supplied garment coverings while in this area. Cleaning debris in the exhaust air system coming from this area will also require proper suiting up against contamination. This includes the vertical shaft through to the exhaust fan.

Access Door Preliminary Plan – Submittal of gasketed doors manufacturer/models is requested with bid. The number and size of access doors to be confirmed and marked the weekend prior **October 5<sup>th</sup>-6<sup>th</sup>**. This plan is preliminary for full contact brush cleaning and pricing is to be priced out per door installed. VA estimates 25 ceiling doors and 50 duct doors as a maximum. If a duct door is not workable then access openings to be closed and sealed. See 2.02 for more details.



Sterilization and Storage Areas – these areas must remain clean. Negative air MUST be used on branches into these areas.

Air Handling Unit (AHU) – cleaning will be greater than NADCA standards. Washing down to remove grease and oils, to include a thorough cleaning between fins of cooling coil.

Storage - SPS has space in the AHU mechanical room and can be used to stage equipment and supplies during the contract performance period.

Parking - Contractors shall park in Lot B (south end) of the Buffalo VA medical Center during week days. Any weekend work will allow parking at/near the loading dock (see attachment).

## **PART 1 -- Special Provisions**

### 1.01 Qualification of the HVAC System Cleaning Contractor

- (A) Membership
- (B) Certification
- (C) Supervisor Qualifications
- (D) Experience
- (E) Equipment, Materials and Labor
- (F) Licensing

### 1.02 Standards

- (A) NADCA Standards

### 1.03 Documents

- (A) Mechanical Drawings

## **PART 2 -- HVAC System Cleaning Specifications and Requirements**

### 2.01 Scope of Work

- (A) Scope

### 2.02 HVAC System Inspections and Site Preparations

- (A) HVAC System Evaluation
- (B) Site Evaluation and Preparations
- (C) Inspector Qualifications

### 2.03 General HVAC System Cleaning Requirements

- (A) Containment
- (B) Particulate Collection
- (C) Controlling Odors
- (D) Component Cleaning
- (E) Air-Volume Control Devices
- (F) Service Openings
- (G) Ceiling sections (tile)

## **PART 2 CONTINUED**

(H) Air distribution devices (registers, grilles & diffusers)

(I) Air handling units, terminal units, blowers and exhaust fans

(J) Duct Systems

### 2.04 Health and Safety

(A) Safety Standards

(B) Occupant Safety

(C) Disposal of Debris

### 2.05 Mechanical Cleaning Methodology

(A) Source Removal Cleaning Methods

(B) Methods of Cleaning Fibrous Glass Insulated Components

(C) Damaged Fibrous Glass Material

(D) Cleaning of coils

(E) Biocidal Agents and Coatings

### 2.06 Cleanliness Verification

(A) General

(B) Visual Inspection

(C) Verification of Coil Cleaning

### 2.07 Pre-existing System Damage

### 2.08 Post-project Report

### 2.09 Applicable Standards and Publications

## **PART 1 -- Special Provisions**

### 1.01 Qualification of the HVAC System Cleaning Contractor

- A. Membership: The HVAC system cleaning contractor shall be a certified member of the National Air Duct Cleaners Association (NADCA), or shall maintain membership in a nationally recognized non-profit industry organization dedicated to the cleaning of HVAC systems.
- B. Certification: The HVAC system cleaning contractor shall have a minimum of one (1) Air System Cleaning Specialist (ASCS) certified by NADCA on a full time basis, or shall have staff certified by a nationally recognized certification program and organization dedicated to the cleaning of HVAC systems.
- C. Supervisor Qualifications: A person certified as an ASCS by NADCA, or maintaining an equivalent certification by a nationally recognized program and organization, shall be responsible for the total work herein specified.
- D. Experience: The HVAC system cleaning contractor shall submit records of experience in the field of HVAC system cleaning as requested by the **owner**. Bids shall only be considered from firms which are regularly engaged in HVAC system maintenance with an emphasis on HVAC system cleaning and decontamination.
- E. Equipment, Materials and Labor: The HVAC system cleaning contractor shall possess and furnish all necessary equipment, materials and labor to adequately perform the specified services.
  - 1. The contractor shall assure that its employees have received safety equipment training, medical surveillance programs, individual health protection measures, and manufacturer's product and Safety Data Sheets (SDS) as required for the work by the U.S. Occupational Safety and Health Administration, and as described by this specification. For work performed in countries outside of the U.S.A., contractors should comply with applicable national safety codes and standards.
  - 2. The contractor shall maintain a copy of all current SDS documentation and safety certifications at the site at all times, as well as comply with all other site documentation requirements of applicable OSHA programs and this specification
  - 3. Contractor shall submit to the **owner** all Safety Data Sheets (SDS) for all chemical products proposed to be used in the cleaning process.
- F. Licensing: The HVAC system cleaning contractor shall provide proof of maintaining the proper license(s), if any, as required to do work in this state. Contractor shall comply with all Federal, state and local rules, regulations, and licensing requirements.

### 1.02 Standards

- A. NADCA Standards: The HVAC system cleaning contractor shall perform the services specified here in accordance with the current published standards of the National Air Duct Cleaners Association (NADCA).
  - 1. All terms in this specification shall have their meaning defined as stated in the NADCA Standards.
  - 2. NADCA Standards must be followed with no modifications or deviations being allowed.

### 1.03 Documents

- A. Mechanical Drawings: The **owner** shall provide the HVAC system cleaning contractor with one copy of the following documents:
1. Project drawings and specifications.
  2. Approved construction revisions pertaining to the HVAC system.
  3. Any existing indoor air quality (IAQ) assessments or environmental reports prepared for the facility.

## **PART 2 -- HVAC System Cleaning Specifications and Requirements**

### 2.01 Scope of Work

- A. Scope: This section defines the *minimum* requirements necessary to render HVAC components clean, and to verify the cleanliness through inspection and/or testing in accordance with items specified herein and applicable NADCA Standards. The Contractor shall be responsible for the removal of visible surface contaminants and deposits from within the HVAC system in strict accordance with these specifications. The HVAC systems serving the hospital areas are served by air handling unit(s) independent to the wards themselves and includes any interior surface of the air distribution system for conditioned spaces and/or occupied zones. This includes the entire heating, air-conditioning and ventilation system from the points where the air enters the system to the points where the air is discharged from the system. The outside air intake grilles, outside air ducts to the air handling unit (AHU), the interior surfaces of the AHU, mixing box, coil compartment, condensate drain pans, humidifiers, supply air ducts, fans, fan housing, fan blades, air wash systems, spray eliminators, turning vanes, filters, filter housings, reheat coils, and supply, return and exhaust diffusers are all considered part of the HVAC system. The HVAC system also includes dedicated exhaust system(s) which is included in this scope of work. The exhaust systems that go into the duct chase's will be cleaned up to the duct chase only (unless otherwise specified), this includes the exhaust fans, exhaust diffusers, and all other exhaust system components.
- B. Final report will be provided to include before and after pictures of ducts, AHU's, Exhaust fans, filter boxes, cooling, pre-heating and reheating coils. Report will also identify any deficiencies found including broken or leaking ducts, filter boxes and access door gaskets, deteriorated insulation or any other issue that could cause a patient safety risk or problems to the operation of the HVAC systems.
- C. Special Conditions: The work contained in this scope will be required to be conducted during the weekend and under specific coordinated time frame for start and finish.

## 2.02 HVAC System Component Inspections and Site Preparations

- A. HVAC System Component Inspections: Prior to the commencement of any cleaning work, the HVAC system cleaning contractor shall perform a visual inspection of the HVAC system to determine appropriate methods, tools, and equipment required to satisfactorily complete this project. The cleanliness inspection should include air handling units and representative areas of the HVAC system components and ductwork. In HVAC systems that include multiple air handling units, a representative sample of the units should be inspected. The cleanliness inspection shall be conducted without negatively impacting the indoor environment through excessive disruption of settled dust, microbial amplification or other debris. In cases where contamination is suspected, and/or in sensitive environments where even small amounts of contaminant may be of concern, environmental engineering control measures should be implemented
  - 1. Damaged system components found during the inspection shall be documented and brought to the attention of the **owner**.
- B. Site Evaluation and Preparations: Contractor shall conduct a site evaluation, and establish a specific, coordinated plan which details how each area of the building will be protected during the various phases of the project. Review by both Infection Control (IC) and Safety for comments is required.
- C. Inspector Qualifications: Qualified personnel should perform the HVAC cleanliness inspection to determine the need for cleaning. At minimum, such personnel should have an understanding of HVAC system design, and experience in utilizing accepted indoor environmental sampling practices, current industry HVAC cleaning procedures, and applicable industry standards.

## 2.03 General HVAC System Cleaning Requirements

- A. Containment: Debris removed during cleaning shall be collected and precautions must be taken to ensure that Debris is not otherwise dispersed outside the HVAC system during the cleaning process.
- B. Particulate Collection: Where the Particulate Collection Equipment is exhausting inside the building, HEPA filtration with 99.97% collection efficiency for 0.3-micron size (or greater) particles shall be used. When the Particulate Collection Equipment is exhausting outside the building, Mechanical Cleaning operations shall be undertaken only with Particulate Collection Equipment in place, including adequate filtration to contain Debris removed from the HVAC system. When the Particulate Collection Equipment is exhausting outside the building, precautions shall be taken to locate the equipment down wind and away from all air intakes and other points of entry into the building.
- C. Controlling Odors: Measures shall be employed to control odors and/or mist vapors during the cleaning process. (See coordination plan 2.02 B)
- D. Component Cleaning: Cleaning methods shall be employed such that all HVAC system components must be Visibly Clean as defined in applicable standards (see NADCA Standards). Upon completion, all components must be returned to those settings recorded just prior to cleaning operations.
- E. Air-Volume Control Devices: Dampers and any air-directional mechanical devices inside the HVAC system must have their position marked prior to cleaning and, upon completion, must be restored to their marked position.

- F. Service Openings: The contractor shall utilize service openings, as required for proper cleaning, at various points of the HVAC system for physical and mechanical entry, and inspection.
1. Contractor shall utilize the existing service openings already installed in the HVAC system where possible.
  2. Other openings shall be created where needed and they must be created so they can be sealed in accordance with industry codes and standards.
  3. Closures must not significantly hinder, restrict, or alter the airflow within the system.
  4. Closures must be properly insulated to prevent heat loss/gain or condensation on surfaces within the system.
  5. Openings must not compromise the structural integrity of the system.
  6. Construction techniques used in the creation of openings should conform to requirements of applicable building and fire codes, and applicable NFPA, SMACNA and NADCA Standards.
  7. Cutting service openings into flexible duct is not permitted. Flexible duct shall be disconnected at the ends as needed for proper cleaning and inspection.
  8. Rigid fiber glass duct systems shall be resealed in accordance with NAIMA recommended practices. Only closure techniques that comply with UL Standard 181 or UL Standard 181a are suitable for fiber glass duct system closures.
  9. All service openings capable of being re-opened for future inspection or remediation shall be clearly marked and shall have their location reported to the **owner** in project report documents.
- G. Ceiling sections (tile): The contractor may remove and reinstall ceiling sections to gain access to HVAC systems during the cleaning process. Closure required prior to proceeding to a new location. Notification is required prior for times greater 4 hours in patent occupied areas. (See coordination plan 2.02 B)
- H. Air distribution devices (registers, grilles & diffusers): The contractor shall clean all air distribution devices.
- I. Air handling units, terminal units (VAV, Dual duct boxes, etc.), blowers and exhaust fans: The contractor shall insure that supply, return, and exhaust fans and blowers are thoroughly cleaned. Areas to be cleaned include blowers, fan housings, plenums (except ceiling supply and return plenums), scrolls, blades, or vanes, shafts, baffles, dampers and drive assemblies. All visible surface contamination deposits shall be removed in accordance with NADCA Standards. Contractor shall:
1. Clean all air handling units (AHU) internal surfaces, components and condensate collectors and drains.
  2. Assure that a suitable operative drainage system is in place prior to beginning wash down procedures.
  3. Clean all coils and related components, including evaporator fins.
- J. Duct Systems. Contractor shall:
1. Create service openings in the system as necessary in order to accommodate cleaning of otherwise inaccessible areas.
  2. Mechanically clean all duct systems to remove all visible contaminants, such that the systems are capable of passing Cleaning Verification Tests (see NADCA Standards).



## 2.04 Health and Safety

- A. Safety Standards: Cleaning contractors shall comply with applicable federal, state, and local requirements for protecting the safety of the contractor's employees, building occupants, and the environment. In particular, all applicable standards of the Occupational Safety and Health Administration (OSHA) shall be followed when working in accordance with this specification. All contractors will provide copies of applicable OSHA cards and other certifications.
- B. Occupant Safety: No processes or materials shall be employed in such a manner that they will introduce additional hazards into occupied spaces.
- C. Disposal of Debris: All Debris removed from the HVAC System shall be disposed of in accordance with applicable federal, state and local requirements. Debris will be transported in closed durable containers by the contractor.

## 2.05 Mechanical Cleaning Methodology

- A. Source Removal Cleaning Methods: The HVAC system shall be cleaned using Source Removal mechanical cleaning methods designed to extract contaminants from within the HVAC system and safely remove contaminants from the facility. It is the contractor's responsibility to select Source Removal methods that will render the HVAC system Visibly Clean and capable of passing cleaning verification methods (See applicable NADCA Standards) and other specified tests, in accordance with all general requirements. No cleaning method, or combination of methods, shall be used which could potentially damage components of the HVAC system or negatively alter the integrity of the system.
  - 1. All methods used shall incorporate the use of vacuum collection devices that are operated continuously during cleaning. A vacuum device shall be connected to the downstream end of the section being cleaned through a predetermined opening. The vacuum collection device must be of sufficient power to render all areas being cleaned under negative pressure, such that containment of debris and the protection of the indoor environment are assured.
  - 2. All vacuum devices exhausting air inside the building shall be equipped with HEPA filters (minimum efficiency), including hand-held vacuums and wet-vacuums.
  - 3. All vacuum devices exhausting air outside the facility shall be equipped with Particulate Collection including adequate filtration to contain Debris removed from the HVAC system. Such devices shall exhaust in a manner that will not allow contaminants to re-enter the facility. Release of debris outdoors must not violate any outdoor environmental standards, codes or regulations.
  - 4. All methods require mechanical agitation devices to dislodge debris adhered to interior HVAC system surfaces, such that debris may be safely conveyed to vacuum collection devices. Acceptable methods will include those, which will not potentially damage the integrity of the ductwork, nor damage porous surface materials such as liners inside the ductwork or system components.
- B. Methods of Cleaning Fibrous Glass Insulated Components
  - 1. Fibrous glass thermal or acoustical insulation elements present in any equipment or ductwork shall be thoroughly cleaned with HEPA vacuuming equipment, while the HVAC system is under constant negative pressure, and not permitted to get wet in accordance with applicable NADCA and NAIMA standards and recommendations.

2. Cleaning methods used shall not cause damage to fibrous glass components and will render the system capable of passing Cleaning Verification Tests (see NADCA Standards).
- C. Damaged Fibrous Glass Material
1. Evidence of damage: If there is any evidence of damage, deterioration, delaminating, friable material, mold or fungus growth, or moisture such that fibrous glass materials cannot be restored by cleaning or resurfacing with an acceptable insulation repair coating, they shall be identified for replacement.
  2. Replacement: When requested or specified, Contractor must be capable of remediating exposed damaged insulation in air handlers and/or ductwork requiring replacement.
  3. Replacement material: In the event fiber glass materials must be replaced, all materials shall conform to applicable industry codes and standards, including those of UL and SMACNA.
  4. Replacement of damaged insulation is **not** covered by this specification.
- D. Cleaning of coils
1. Any cleaning method may be used which will render the Coil Visibly Clean and capable of passing Coil Cleaning Verification (see applicable NADCA Standards). Coil drain pans shall be subject to Non-Porous Surfaces Cleaning Verification. The drain for the condensate drain pan shall be operational. Cleaning methods shall not cause any appreciable damage to, displacement of, inhibit heat transfer, or erosion of the coil surface or fins, and shall conform to coil manufacturer recommendations when available. Coils shall be thoroughly rinsed with clean water to remove any latent residues.
- E. Antimicrobial Agents and Coatings
1. Antimicrobial agents shall only be applied if active fungal growth is reasonably suspected, or where unacceptable levels of fungal contamination have been verified through testing.
  2. Application of any antimicrobial agents used to control the growth of fungal or bacteriological contaminants shall be performed after the removal of surface deposits and debris.
  3. When used, antimicrobial treatments and coatings shall be applied in strict accordance with the manufacturer's written recommendations and EPA registration listing.
  4. Antimicrobial coatings shall be applied according to the manufacturer's written instructions. Coatings shall be sprayed directly onto interior ductwork surfaces, rather than "fogged" downstream onto surfaces.

## 2.06 Cleanliness Verification

- A. General: Verification of HVAC System cleanliness will be determined after mechanical cleaning and before the application of any treatment or introduction of any treatment-related substance to the HVAC system, including biocidal agents and coatings.
- B. Visual Inspection: The HVAC system shall be inspected visually to ensure that no visible contaminants are present.
1. If no contaminants are evident through visual inspection, the HVAC system shall be considered clean; however, the **owner** reserves the right to further verify system cleanliness through Surface Comparison Testing or the NADCA vacuum test specified in the NADCA standards.
  2. If visible contaminants are evident through visual inspection, those portions of the system where contaminants are visible shall be re-cleaned and subjected to re-inspection for cleanliness.

3. NADCA vacuum test analysis should be performed by a qualified third party experienced in testing of this nature.
- C. Verification of Coil Cleaning
1. Cleaning must restore the coil pressure drop to within 10 percent of the pressure drop measured when the coil was first installed. If the original pressure drop is not known, the coil will be considered clean only if the coil is free of foreign matter and chemical residue, based on a thorough visual inspection (see NADCA Standards).

#### 2.07 Pre-existing System Damage

- A. Contractor is not responsible for problems resulting from prior inappropriate or careless cleaning techniques of others.

#### 2.08 Post-project Report

- A. At the conclusion of the project, the Contractor shall provide a report to the **owner** indicating the following:
1. Success of the cleaning project, as verified through visual inspection and/or gravimetric analysis.
  2. Areas of the system found to be damaged and/or in need of repair.

#### 2.09 Applicable Standards and Publications:

The following current standards and publications of the issues currently in effect form a part of this specification to the extent indicated by any reference thereto:

- A. National Air Duct Cleaners Association (NADCA): "Assessment, Cleaning & Restoration of HVAC Systems (ACR 2005)," 2004.
- B. National Air Duct Cleaners Association (NADCA): "Understanding Microbial Contamination in HVAC Systems," 1996.
- C. National Air Duct Cleaners Association (NADCA): "Introduction to HVAC System Cleaning Services," 2004.
- D. National Air Duct Cleaners Association (NADCA): Standard 05 "Requirements for the Installation of Service Openings in HVAC Systems," 2004.
- E. Underwriters' Laboratories (UL): UL Standard 181.
- F. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE): Standard 62-89, "Ventilation for Acceptable Indoor Air Quality".
- G. Environmental Protection Agency (EPA): "Building Air Quality," December 1991.
- H. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): "HVAC Duct Construction Standards - Metal and Flexible," 1985.
- I. North American Insulation Manufacturers Association (NAIMA): "Cleaning Fibrous Glass Insulated Air Duct Systems," 1993.