PART 1 - GENERAL

1.1 APPLICABLE REQUIREMENTS

A. All work to be furnished and installed under this section shall comply with all the requirements of General conditions, Supplemental Conditions, Division 01 - General Requirements, Section 230500 - Basic Materials and Methods, and other Sections in Division 23 specified herein.

1.2 SCOPE

A. All work to be furnished and installed under this Section shall comply with all the requirements of Division 01, and shall include, but not necessarily be limited to, the following:
   1. Air filters and Associated Hardware
   2. Activated Carbon and Odoroxidant Media
   3. Air Filter Gauges

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 230500: Basic HVAC Materials and Methods

B. Section 233113: Air Distribution

1.4 QUALITY ASSURANCE

A. Codes and Standards: Provide products conforming to the requirements of the following:
   1. ASHRAE Standard 52.2-1999.
   2. Underwriters Laboratory: UL 900, UL 586
   3. NFPA Standard 90A
   4. UL Standard 867 and CSA Standard C22.2 No. 187-M19986 for electrostatic Air Cleaners

B. Design Criteria
   1. Air flow not to exceed rated capacity
   2. Initial and final resistance not to exceed scheduled values.

C. Filters for Schools and State Funded Buildings
   1. Air filters shall be of an approved type tested in accordance with CMC Chapter 17 (CMC Section 314.2). Pre-formed filters having combustible framing shall be tested as a complete assembly.
   2. Air filters in all occupancies shall be U.L. Class 2 or better, as defined in the test method above.
   3. Air filters shall be accessible for cleaning or replacement.

1.5 SUBMITTALS

A. Prior to construction, submit for approval on all materials and equipment.
   1. Manufacturer's name and catalog data
   2. Installation Data
   3. Capacities and Resistances

4. Materials of Construction

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to the site in containers with manufacturer's stamp or label affixed.

B. Store and protect all products against dirt, water, chemical, and mechanical damage. Do not install damaged products. Remove damaged materials from project site.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Filters: Except where noted, Model numbers given throughout are listed for Eco-Air products.
1. Eco-Air Products, Inc.
2. American Air Filter
3. Westates Carbon
4. Farr
5. Flanders
6. Camfil-Farr
7. Filtration Group

B. Non-ionizing, polarized media electronic air cleaners
1. Dynamic Air Quality Solutions

C. Accessories
1. Framing Modules - Eco-Air K-Trac, Filtration Group
2. Air Filter Gages - Dwyer
3. Metal Filters - Eco-Air Metal Masters

2.2 FILTER CARTRIDGES

A. Panel Filters - Construction grade
1. Disposable Filters
2. Fiberglass or polyester media and cardboard frames, completely disposable, thickness as scheduled.
3. Permanent washable types not acceptable.
4. U.L. Class 2 listed.

B. Pleated Media Filters (ASHRAE Dust-spot Efficiency 25-30%)
1. Filter media of a high-loft, reinforced, non-woven cotton/synthetic blend.
2. Media support is continuously laminated to an expanded metal grid on the air leaving side.
3. Radial wedge pleat design.
4. Media frame is constructed from two pieces of die-cut high wet-strength carrier board. The frame is designed with diagonal and horizontal support members bonded to the media on the air entering and leaving sides.
5. U.L. Class 2 listed.

C. Pleated Media Filters (ASHRAE Dust-Spot Efficiency 50%)
1. Filter media of high efficiency micro-fine glass fiber reinforced with a synthetic backing.

2. Media support is continuously laminated to an expanded metal grid on the air leaving side.
3. Pleat design shall be a radial wedge pleat.
4. The enclosing frame is constructed from moisture-resistant chipboard. Perforated steel support grilles are placed on the upstream and downstream sides. The entire unit is then sealed to insure a positive media-to-frame bond.
5. U.L. Class 2 listed.

D. Medium and High Efficiency Bag Filters
1. Filter Construction
   a. Replaceable factory-assembled cartridges incorporating a fine-fibered all-glass medium encased in a non-woven backer mat material. Filters up to 22" in depth shall be designed to operate in Variable Air Volume Systems.
   b. Provide cartridge frame with a gasket on the vertical sides to prevent leakage between the cartridges if installed in framing modules or side access housings.
   c. Open area on the cartridge face available for air passage: not less than 90 percent of the total face area.
   d. Flexible internal supports maintain individual pleats in a tapered form under rated airflow conditions. At any point, the size of the upstream and downstream air-passage are in exact proportion to the volume of unfiltered and filtered air being handled at that point.
   e. Each pocket shall be individually sewn with stringently regulated stitching to create a uniformly shaped channel. Each stitch line to be sealed with a thin thermoplastic bead to prevent air bypass. All pocket edges shall be finished with a 4-thread stitch to maintain maximum airflow and durability.
   f. U.L. Class 2 construction and so listed.
2. Performance
   a. Initial and final resistance not to exceed the scheduled values.
   b. Media area must equal or exceed that of the specified products.
   c. Determine the average efficiency using the ASHRAE Standard 52.1 Test Method using atmospheric dust.
3. Test Report
   a. Submit an independent test laboratory report showing the pressure drop of the clean filter cartridge elements at flow rates from 75% to 125% of the manufacturer's published rated capacity for the filter cartridge elements.
   b. Perform this test in an ASHRAE test duct system in accordance with the applicable portion of ASHRAE Standard 52.1.

E. Medium and High Efficiency Rigid Filters (Separator Type U.L. Class 1)
1. Filter Construction
   a. Totally rigid type, constructed by pleating a continuous sheet of moisture-resistant all-glass media into closely-spaced pleats with hemmed edge aluminum separators.
   b. Filter pack shall be sealed in a 24 gauge galvanized steel frame with fire-retardant urethane resin potting compound.
   c. Media area per 24x24x12 size filter shall be 91 square feet per 65% and 85% efficient filters and 116 square feet per 95% efficient filters.
   d. U.L. Class 1 construction and so listed.
   #R6908 (N)

F. Medium and High Efficiency Rigid Filters (Lofted Media Type U.L. Class 2)
   1. Filter Construction
      a. Totally rigid type with a lofted high-density microfine glass filter media laminated to a non-woven backing. The media shall be supported by an expanded metal support grid bonded to the media to eliminate media oscillation. Media finger supports shall be manufactured of an industrial strength board and be permanently installed on both air leaving sides, (4) per side.
   2. Enclosing Frame
      a. The enclosing frame shall be manufactured of 26 gauge galvanized steel and furnished with horizontal and diagonal support members to stabilize and protect the media pack.

G. Non-ionizing, Polarized Media Electronic Air Cleaners
   1. Operation: The Air Cleaner shall have an active electrostatic field that polarizes a dielectric media. It shall not ionize airborne particles or produce ozone.
   2. Laboratory Testing Performance: Using the ASHRAE 52.2 protocol with carbon black in the test dust, the Air Cleaner shall test at MERV 13. Using the ASHRAE 52.2-NC protocol (with no carbon in the loading dust), the Air Cleaner shall test at MERV 15. As installed, it shall have a clean static pressure drop of less than 0.3” w.g. at 500 feet per minute and shall increase in resistance no more than 0.25” w.g. with a dust loading of 2,855 grams. It shall hold a total of 4,582 grams of dust at its final resistance of 1.4” w.g. per 24x24 module. Any substitute Air Cleaner must meet these MERV ratings, static pressures and loading characteristics. The Air Cleaner manufacturer must provide testing from an approved ASHRAE test lab to verify MERV rating, operational and loading performance.
   3. Field Performance: The Air Cleaner manufacturer shall produce at least two documented installation references, including client contact information with the following criteria:
      a. Air Cleaners shall have operated continuously for a minimum of 2.5 years with no pre-filtration and without media change and achieved an increase of less than .2 inches of static pressure at a face velocity of ~500fpm, in an urban environment. Air cleaner installations must be greater than 10,000 cfm and serving office and/or hospital space.
      b. In an urban environment, Air Cleaners must have demonstrated the ability to achieve indoor ultra-fine particle and black carbon levels that are up to 94% lower than the concentrations in the air outside the building. Outdoor air levels brought into in the building must be based on the ASHRAE Standard 62 Ventilation Rate Procedure.
      c. Air Cleaners shall have a documented ability to reduce TVOC levels by 50-60% in a single pass. Air Cleaners must have already been in service for over 90 days. Tests must be administered by an independent, third-party and readings must be taken immediately upstream and downstream of the Air Cleaning system over at least a 24-hour period.
   4. Construction: The Air Cleaner modules shall consist of four or six individual Air Cleaner Panels that are nominally 1” in depth, arranged in V’s within the module. The construction of the Air Cleaner frame and screens shall be aluminum, and the module side panels and attachment flanges shall be of galvanized steel. The Air Cleaner modules and each component thereof must have a positive seal where necessary to prevent bypass of unfiltered

air.

5. Electronics: The high voltage powerheads shall require 24 volts AC input and have a 9.5kV DC output. The powerheads must be fully potted and connected in parallel.
6. Control Panel: The 24VAC power supply must be a UL or CSA certified transformer, class “2” type, which shall permit one side of the secondary output (24V) to be attached to electrical ground. A Filter Minihelic gauge shall be installed in the Unit Control Panel (optional direct readout or signal tied into building automation).
7. Filter Media: Each Air Cleaner shall have a disposable and recyclable media pad with a minimum of a class “2” fire rating. It shall have a positive seal in the overall filter assembly.
8. Configuration: The Air Cleaners will be arranged in pre-fabricated module assemblies nominally 12” or 18” in height, of varying widths up to 48”, and 24” in depth in direction of airflow. The number of modules and width shall be such that the face velocity thru the filter bank shall be no more than 550 fpm. Dynamic. Provide side or face load configuration system as indicated on air handler schedule. Minimum requirements: 24” doors/access panels on both sides of filter section and 25” unobstructed upstream/downstream space in the filter section.
9. Electrical Connection: The Air handler manufacturer shall provide a fully operational filter section for field connection and field electrical tie-in. All 24VAC electrical and control wiring integral to the Air Cleaner modules and Control Panel, including the access door interlocks, are to be provided by the Air Cleaner manufacturer for connection in the field or factory. All line voltage connections and wiring are the responsibility of the contractor.
10. Maximum Allowable Static Pressure: To minimize energy consumption, the AHU fan system has been designed for specific pressure drop through the Air Cleaning system. The fan system is designed for a maximum of 0.75" w.g when the filters are dirty.
11. Construction and Start-up: If the AHU is operating during construction, the Air Cleaner bank shall be protected using roll or other media. These should be removed after 30 days from initial startup.
12. Replacement Media (optional): The AHU manufacturer is responsible to purchase and store sufficient replacement filters so as not to exceed a total static pressure of 0.75” w.g (Matching #11 above) for a period of 4 years from final acceptance. Material responsibility not to exceed total media changes of 6 times per year.
13. Basis of Design: Dynamic Air Quality Solutions Model V8 Air Cleaning System

H. DOP rated and HEPA Filters

1. Filter Construction
   a. Filter medium: all glass, water-proofed, so as to retain 50% of its tensile strength after being immersed in water.
   b. Filters to be constructed by pleating a continuous sheet of medium into closely spaced pleats with hemmed edge type aluminum separators.
   c. Adhesive sealer: self-extinguishing rubber base.
   d. Filter frames: 16 gauge galvanized steel, assembled in a rigid manner.
   e. Over-all dimensions to be correct to within plus or minus 1/16" and squareness within 1/8".
   f. Where specified, furnish with tapered separators for lower initial

resistance and higher CFM capacity (Alpha 2000 High Capacity HEPA).

2. Performance
   a. Filters 95%, 99.97%, 99.99% or 99.999% efficient as scheduled and individually tested and certified to have not less than this efficiency when tested with 0.3 micrometer DOP smoke.
   b. Filters 95% efficiency do not require individual testing.
3. Basis of design: Eco-Air Alpha 95, Alpha Cell 99.97% through 99.999%, or Alpha 2000 high capacity.

I. Panel Air Filters
1. The side access filter cabinet shall match the air handler cabinet with similar construction and finish. Hinged access doors with positive-latching fasteners shall be provided at both ends of the housing. Sheet metal screws shall not be used.

J. Extended Area Air Filters
1. Holding frames and side access housings shall be provided under Section 233113 by the filter manufacturer.
2. The rooftop unit manufacturer shall install the holding frames or framing modules in the unit at the factory in strict accordance with Section 233113.
3. Side access filter housings may be supplied by the central station air handler manufacturer if:
   a. The housing construction meets or exceeds that of the specified housing; and
   b. Such housings are offered as a standard product by the air handler manufacturer; and
   c. The housings provide equal or greater filter face area.

2.3 MODULAR FRAMING SYSTEM (UPSTREAM OR DOWNSTREAM ACCESS)

A. Medium and high efficient extended surface ASHRAE-rated filters shall be installed in extruded (mill finish) (anodized) aluminum framing modules factory-cut, pre-punched and packaged with all necessary stiffening members and thread cutting screws for field assembly into modules up to 12' high and 14' wide using only a screwdriver or socket wrench.

B. The framing members shall be permanently gasketed with a reinforced nylon pile seal to prevent the bypass of unfiltered air. Each horizontal row of filters shall have a positive spring-loaded sealing device which will allow easy installation and removal of cartridges from either upstream or downstream access as specified and shall secure the seal between cartridges while the bank is in operation.

C. A separate track shall be incorporated for 2" panel pre-filters (if desired or specified) which can be serviced from upstream without disturbing the final filters.

D. Basis of design: Eco-Air K-Trac

2.4 INDIVIDUAL HOLDING FRAMES FOR BUILT-UP BANKS

A. Frames for panel filters
1. 16 gauge (galvanized) (304 stainless) steel with filter sealing gaskets and fasteners.

2. Basis of design: Eco-Air Type 9 Holding Frame

B. Frames for ASHRAE-rated Extended Area Filters
1. 3 inches deep, 16 gauge (galvanized) (304 stainless) steel with gaskets and filter retaining clips to maintain a positive pressure seal between the frame and the replaceable filter element and matching rivet holes to facilitate installation.
2. Provide frames with clips or other means to hold a 2" panel pre-filter if desired, removable without disturbing the final filter element.
3. Basis of design: Eco-Air Type 9 Frame

C. Frames for DOP-rated and HEPA Filters.
1. 16 gauge (galvanized) (304 stainless) steel with filter retaining fasteners and matching rivet holes with depth to match the filter cartridges.
2. Provide bolt type fasteners and flat-edge sealing surfaces.
3. Basis of design: Eco-Air Model Alpha Frame

2.5 SIDE ACCESS HOUSINGS, FACTORY ASSEMBLED

A. Housings for 2", 4" or 6" Filters (Single Stage)
1. Housing shall be factory manufactured of 16 gauge galvanized steel and reinforced to eliminate twisting or racking.
2. 16 gauge access doors shall be gasketed along the periphery to maintain a proper seal.
3. Filter track shall be aluminum extruded type and furnished with a polypropylene fin seal gasket.
4. Basis of design: Eco-Air Surepleat

B. Housing for ASHRAE-rated Extended Area Filters (Two Stage)
1. Housing shall be manufactured of 16 gauge galvanized steel and reinforced with "Z" channel bracing. A standing flange on the air entering and air leaving side shall be furnished to facilitate installation.
2. Provide access doors with continuous gasketing on the perimeter and positive locking latches with easy-grip knobs. Both pre-filter and final filter tracks to be extruded aluminum with polypropylene fin seal gasket to create a positive seal of the filter to the track.
3. Provide factory-installed gasketing on the vertical sides of cartridges to prevent leakage between cartridges and between cartridges and doors. Filter cartridges must be capable of removal and loading through either access door.
4. The leakage rate of the housing shall be less then .5% of air flow at 6.0" W.G. internal static pressure.
5. Basis of design: Eco-Air Sureseal Housing

C. Housings for DOP-rated 95% and HEPA Filters
1. Housing shall be fabricated of 14 gauge galvanized steel and shall be reinforced with bracing to assure total rigidity. It shall be equipped with standing flanges for ease of installation into duct work.
2. Furnish with (4) spring-loaded bolt type clamps to secure each HEPA Filter. The design of the mounting surface and clamps shall be such to maintain a proper sealing integrity.
3. All metal-to-metal joints shall be welded for leakproof tightness at + or -8" W.G. internal static pressure.
4. Basis of design: Eco-Air Surelock HEPA Housing

~~D. Carbon Filter Housings (Side Access)~~

~~1. Housing shall be designed to hold total detention carbon trays in a "V" arrangement.~~

~~2. Manufactured of 16 gauge galvanized steel and reinforced to eliminate racking of the housing once carbon trays have been installed.~~

~~3. Furnish access doors on both sides of the housing. Doors to be gasketed to seal the trays and be furnished with positive seal latches and easy-grip knobs.~~

~~4. Pre-filter tracks and carbon tray tracks shall be extruded aluminum with replaceable polypropylene pile gaskets to prevent air bypass.~~

~~5. Basis of design: Eco-Air Surecarb Housings~~

~~E. Carbon Adsorbers (Front Load)~~

~~1. 24x24 and 12x24 adsorbers shall be constructed of 16 gauge galvanized steel and designed for front load filter bank applications.~~

~~2. Molded plastic slider tracks to accept total detention carbon trays.~~

~~3. Adsorber housing shall incorporate integral holding frames for particulate pre-filters and after filters.~~

~~4. Basis of design: Eco-Air Model FLC 2000.~~

~~2.6 GAS AND VAPOR PHASE CONTROL MEDIA AND TRAYS~~

~~A. Activated Carbon Media~~

~~1. HVAC grade virgin carbon granules, 4 x 6 mesh.~~

~~2. Carbon tetrachloride (CTC) activity of 60 minimum with a ball abrasion hardness of 95 minimum per ASTM D-380.~~

~~3. Ash content - 5% maximum per ASTM D-2866.~~

~~4. Moisture content - 5% maximum by weight.~~

~~5. Bulk density - .50 - .54 g/ml (31-34 #/cu. ft.) as packed.~~

~~6. Media shall be loaded into trays by the vendor, but shall not be installed until immediately prior to beneficial occupancy and all paints and cleaning solvents are dry.~~

~~7. Basis of design: Eco-Air activated carbon.~~

~~B. Odoroxidant Media~~

~~1. Impregnated activated alumina media with a U.L. Class 1 rating designed to remove gaseous vapors such as H_2S, SO_2m SO_3, Ethylene (Olefins), Formaldehyde and Methy/Ethyl Mercaptans. It also has the ability to adsorb and absorb products of Aldehydes, light organic vapors, organic acids and inorganic acids.~~

~~2. Physical properties:~~

~~a. Built in color indicator Purple~~

~~b. Shape Spherical~~

~~c. Mean Particle Diameter1/8" - 3/16"~~

~~d. Moisture, Maximum15% w/w~~

~~e. Bulk Density50 lbs/ft~~

~~f. Active Ingredients Potassium Permanganate (KMnO4), 4% by weight,~~

~~g. Inert Ingredients Alumina (AL_2o_3)~~

~~h. U.L. Class 1 Rating Yes~~

~~3. Basis of Design: Unisorb Mark 2~~

~~C. Media Trays~~

~~1. Constructed of non-corrosive high impact polystyrene with internal~~

~~separators and filled with HVAC grade virgin carbon media.~~

~~2. Capable of being reloaded with fresh carbon in the field.~~

~~3. Basis of design: Eco-Air FLC 2000-ATP.~~

~~2.7 BAG-IN / BAG-OUT HEPA FILTER HOUSING UNIT~~

~~A. General: Stainless steel side access bag-in/bag-out filter housing with tapered round duct inlet/outlet, and isolation dampers suitable for exterior housing a pre-filter and HEPA filter.~~

~~B. Manufacturer: Flanders model BG1-4GGF-304-D3 or Camfill-Farr.~~

~~C. Construction:~~

~~1. 11 and 14 gage type 304 stainless steel.~~

~~2. Housing shall be fully welded on all joints across pressure boundaries and built to with stand 20" wc. pressure.~~

~~3. Access doors: removable access door for each filter. A rubber lip shall effect a seal between the housing and the access door. The filter locking mechanism and access door shall interface in such a manner that the door cannot be closed until the filters are correctly seated in the housing and sealed to the mounting frame.~~

~~4. ID plate: provide manufacturer ID plate to facilitate re-order of critical replacement parts~~

~~5. Manual pocket: provide metal pocket for storage of User manual.~~

~~6. Inlet and Outlet: air flow shall be linear and smooth. Provide tapered round to rectangular sheet metal transitions from flanged inlet/outlet to filter bank.~~

~~7. Filter locking mechanism: shall be a replaceable locking tray having approximate clamping load of 1400 lbs for a 24x24 filter. All components shall be stainless steel.~~

~~8. Bag-out Port: each tier shall have a bag-out port inside the access door which shall be hemmed on its outer edges to prevent bag tear. There shall be ribs to hold the bag's elastic shock cord.~~

~~9. Bag-out: shall be provided with a 8 mil. transparent PVC bag with elastic shock cord hemmed for a firm fit when stretched around bag-out port.~~

~~10. Gasket seal: continuous flat surface on the sealing frame on the housing that mates with the continuous filter gasket.~~

~~11. Testing: factory tested in accordance with ANSI-N509-1980 and ANSI-N510-1980~~

~~12. Required accessories:~~

~~a. Round "bubble-tight" isolation dampers on inlet and outlet. Dampers shall have drilled flanges.~~

~~b. Filter removal tray~~

~~c. DOP test ports: (1) - Upstream injection port (shipped loose for Contractor field installation); (2)- test ports factory installed on door access side of housing upstream of filters; (1) sampling test port, downstream of filters. Test ports to be stainless steel half couplings with brass hex plugs~~

~~d. Filtered magnahelic gages, and gage tubing factor pre-installed.~~

~~e. Rectangular-to-round stainless steel transitions from housing with Bubble-Tight dampers.~~

~~f. Two spare sets of filter change-out bags and shock cords~~

~~g. Two spare sets of HEPA and Pre-filters.~~

~~D. Unit shall be certified prior to owner occupation, submit paper work to owner.~~

~~2.8~~**2.6** AIR FILTER GAGES

A. Dial type, diaphragm-actuated with external zero adjustment and 3-7/8 inch diameter dial.

B. With two (2) static pressure tips, 2-way valves, tubing and mounting plate (and adjustable signal flag).

C. Range as recommended by filter manufacturer.

D. Basis of design: Dwyer 2000 Series Magnehelic.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Filter Bank Construction
1. Filter banks of individual holding frames: install leak tight and structurally sound to eliminate air bypass.
2. Filter banks three filters high or higher: provide 3" wide 16 gauge (galvanized) (stainless) steel stiffeners between each vertical row of filters. Caulk frames before installing. After installation caulk any gaps appearing at the leading edge of the holding frames. Use DAP "Butyl Gutter and Lap Sealer." After erection of the filter bank and careful caulking, tape the joints between filter frames on the downstream side with 1" duct tape.
3. HEPA filter frames over 6" deep do not require stiffeners, only taping and caulking. HEPA filter frames must be bolted together; welding will not be acceptable.
4. Framing modules require sealant and stiffening only between modules and around the periphery.

B. Filter gages are to be installed across each filter bank, mounted where directed. One gage may serve immediately adjacent pre-filter/final filter banks.

C. Temporary Pre-filters for Construction
1. Protect all 40% or higher efficient filters upstream of air handling units during construction with temporary blankets of 2" polyester or fiberglass filter media or 2" disposable panel filters, U.L. Class 2 listed.
2. Remove after air balancing and prior to acceptance.
3. Provide a spare set of these temporary pre-filters or media and install them during construction if required per 3.04B.

3.2 SPARE FILTERS

A. Furnish one new complete spare set of cartridges for each filter bank listed below on completion and acceptance of the work:
1. Medium and high efficient bag filters.
2. Medium and high efficient rigid filters.
3. DOP-rated 95% and HEPA filters.

B. Install spare set in A. above only if and when directed. If not installed, deliver to owner in sealed carton.

C. Replace all panel filters which are not temporary pre-filters with a new set at job completion and furnish owner with an additional set in sealed cartons.

~~D. Furnish owner with one set of spare trays loaded with carbon, if carbon housings or adsorbers are specified on this project.~~

3.3 FIELD QUALITY CONTROL

A. Filter cartridges shall be capable of easily being loaded and unloaded through access doors in the housings or access sections.

3.4 START-UP PROCEDURE

A. No fan shall be operated unless all particulate filters as specified (except gas phase filters) are installed, along with temporary pre-filter media as outlined in 3.01.C.

~~B. When the pressure drop of the temporary media reaches 0.5" W.G. during construction, replace it with the spare set. If not used, deliver the spare set to the owner at job completion.~~

~~C. Gas phase carbon trays shall not be installed until just prior to beneficial occupancy and all paint is dry and cleaning solvents are completely evaporated. Test and balance contractor shall allow for resistance of carbon trays in his work by simulating their resistance on the system.~~

3.5 SCHEDULE

A. See air filters scheduled on drawings for filter model numbers, CFM and sizing data.

END OF SECTION