



DASNY

ANDREW M. CUOMO
Governor

ALFONSO L. CARNEY, JR.
Chair

REUBEN R. MCDANIEL, III
Acting President & CEO

SECTION A

ALBANY (HEADQUARTERS): 515 Broadway, Albany, NY 12207 | 518-257-3000
NEW YORK CITY: One Penn Plaza, 52nd Floor, New York, NY 10119 | 212-273-5000
BUFFALO: 539 Franklin Street, Buffalo, NY 14202 | 716-884-9780
ROCHESTER: 3495 Winton Place, Building C, Suite 1, Rochester, NY 14623 | 585-461-8400

DORMITORY AUTHORITY STATE OF NEW YORK
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DASNY

RE-BID NO.: 659	PROJECT NAME & LOCATION: CUNY Queens College 65-30 Kissena Blvd. Flushing, NY 11367
Description: Furnish and Deliver an Air Duct Silencer Re-Bid Open Location: DASNY 515 Broadway, Albany, NY 12207	
Re-Bid Open Date: April 8, 2020 Re-Bid Open Time: 2:30 p.m.	Contact: Theresa Graffeo

NOTICE TO BIDDERS

MAIL BIDS EARLY

Sealed bids will be received by DASNY at the above address for the items listed in the attached Bid Breakdown and Schedule. When submitting your bid you must:

1. Prepare your bid on the attached Bid Breakdown and Schedule. Return one signed original of the Bid Breakdown and Schedule
2. If your bid deviates from Specifications, explain such deviations or qualifications on your letterhead, setting forth therein such explanations, and attach them to the Bid Breakdown and Schedule.
3. Submission of a bid constitutes full knowledge and acceptance of all provisions of the Notice to Bidders, all information referenced in the Purchasing General Conditions, Supplemental and Detailed Specifications, the Bid Submission and any Supplemental General Requirements contained herein, as well as any addenda issued in relation to the Invitation for Bids.
4. Each bid shall bear on the outside of the envelope the name of the bidder, address, telephone number and designated as a bid for the following:
DASNY Re-Bid No. 659
Re-Bid Opening Date: 04/08/2020 @ 2:30PM
Return to:
DASNY
Attn: Purchasing Unit
515 Broadway
Albany, NY 12207-2964



Re-Bid No.: 659

When a sealed bid is placed inside another delivery jacket, the bid delivery jacket must be clearly marked on the outside “**BID ENCLOSED**” and “**ATTENTION: PURCHASING UNIT**”. The Dormitory Authority will not be responsible for receipt of bids which do not comply with these instructions.

5. Mail bid responses early in order for them to be received before the time of the bid opening. **Late bids will be automatically rejected.** Individuals submitting bids in person or by private delivery services should allow sufficient time for processing through building security to assure that the bids are received prior to the deadline for submitting bids. All individuals who plan to attend bid openings will be required to present government-issued picture identification to building security officials and obtain a visitor’s pass prior to attending the bid opening.

6. In accordance with State Finance Law § 139-j and 139-k, this solicitation includes and imposes certain restrictions on communications between Dormitory Authority personnel and an Offerer during this procurement process. Designated contact for this solicitation is:
Theresa Graffeo, Purchasing Coordinator, at Dormitory Authority – State of New York, 515 Broadway, Albany, NY 12207, (518) 257-3583. Contacts made to other Dormitory Authority Personnel regarding this procurement may disqualify the Offerer and affect future procurements with governmental entities in the State of New York. Please refer to the Authority’s website www.dasny.org for Authority policy and procedures regarding this law, or the NYS office of General Services website www.ogs.ny.gov/BU/PC/ for more information about this law.



Bid No.: 659

If you are not submitting a bid it is requested that you complete and return the lower portion of this form

(Please check all that apply and provide comments in the space provided, if necessary)

- We are not Submitting a bid.
- We Request removal of our name from the mailing list.
- Location of the job site.
- Commodity is not carried by our company.
- Scope is too large.

Other/Additional Explanation: _____

NAME OF BIDDER: _____

ADDRESS : _____

Street Telephone	City	State	Zip
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Signature of Bidder

Official Title

The Omnibus Procurement Act of 1992 and § 2879 of the NYS Public Authorities Law require that by signing this bid, contractors certify that whenever the total bid amount is greater than \$1 million:

1. The contractor has made reasonable efforts to encourage the participation of New York State Business Enterprises as suppliers and Subcontractors on this project, and has retained the documentation of these efforts to be provided upon request to the State. If the contractor determines that NYS business enterprises are not available to participate on the contract as subcontractors or suppliers, the contractor shall provide a statement indicating the method by which such determination was made. If the contractor does not intend to use subcontractors, contractor shall provide a statement verifying such;
2. The contractor has complied with the Federal Equal Opportunity Act of 1972 (PL 92-261), as amended;
3. The contractor agrees to make reasonable efforts to provide notification to New York State residents of employment opportunities on this project through listing any such positions with the Job Service Division of the New York State Department of Labor, or providing such notification in such manner as is consistent with existing collective bargaining contracts or agreements. The contractor agrees to document these efforts and to provide said documentation to the State upon request;

DASNY is required by law to notify the NYS Department of Economic Development of any procurement contract for one million dollars or more that is to be awarded to an out-of-state vendor. This notice must be done simultaneous to the notification of award provided to the vendor. A purchase order or contract cannot be issued until fifteen (15) days after such notification is provided.



DASNY

GENERAL SPECIFICATIONS

- (1) The enclosed Purchasing General Conditions are hereby incorporated by reference. Submission of a bid response shall constitute acceptance of such conditions. Any exceptions/clarifications/qualifications to these conditions or other specifications and/or requirements contained herein must be clearly stated in the bid response and, depending upon the nature of such, may be grounds for rejection of your bid.
- (2) Bids must be submitted in the bidder's full legal name, or the bidder's full legal name plus a registered assumed name, if any.
- (3) All NYS bidders are required to be registered to do business with the NYS Department of State or their local County Clerk, whichever is applicable.
- (4) All out-of-state bidders will be required to provide proof of registration to do business in their state. All out-of-state bidders that "do business in New York State" **MUST BE REGISTERED WITH THE NYS DEPARTMENT OF STATE**. Please contact the NYS Department of State at (518) 473-2492. Information is available at the DOS website: www.dos.ny.gov
- (5) DASNY is required by law to notify the Empire State Development of any procurement contract for one million dollars or more that is to be awarded to an out-of-state vendor. This notice must be done simultaneous to the notification of award provided to the vendor. A purchase order or contract cannot be issued until fifteen (15) days after such notification is provided.
- (6) Empire State Development is required by law to identify states and other jurisdictions that impose preferences or other penalties against New York bidders. DASNY is precluded from soliciting bids or entering into procurement contracts with companies that have their principal place of business located in one of the listed jurisdictions, unless the procurement is for a product that is substantially manufactured in New York State or the services are to be performed in New York State. Currently, this list of jurisdictions includes the states of Alaska, Hawaii, Louisiana, South Carolina, West Virginia and Wyoming.
- (7) Unless otherwise indicated, any reference to brands or model numbers is intended to establish a standard. Items of all manufacturers will be considered, provided the item is determined to meet or exceed the required specification. DASNY's decision as to whether a substitute item meets specification will be final. Your attention is directed to Article II-7, Page 5 of the General Conditions. In order to evaluate substitute items, detailed specifications must be submitted for any product that is other than the one(s) specified in the bid.



DASNY

GENERAL SPECIFICATIONS CONTINUED

- (8) Unless otherwise noted, guarantee on all items is to be one year as detailed in Article XVI of the General Conditions
- (9) All upholstered furniture and drapery panels and lining must meet strict flammability requirements. Standards applicable to this bid, if any, will be delineated in the Detailed Specifications.
- (10) LABOR/TRADES - Any labor, materials or means whose employment, or utilization during the course of this contract, shall not in any way cause or result in strike, work stoppages, delays, suspension of work; or similar troubles by workers employed by this contractor or his subcontractors, or by any of the trades working in or about the buildings and premises where work is being performed. Any violation by the contractor of this requirement may in the sole judgment of DASNY be considered as proper and sufficient cause for declaring the contractor to be in default, and for the owner to take action against him as set forth in the Purchasing General Conditions, Article VIII, "Termination", or such other action as DASNY may deem proper.
- (11) Bid results are available on the DASNY website (www.DASNY.org). Bid results will not be given over the phone.
- (12) If you are a NYS Certified Minority or Women Owned Business, please include a copy of your certification with the bid.



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SUPPLEMENTAL SPECIFICATIONS

The following items are attached for informational purposes. Referenced documents need not be returned with the proposal. These documents are only applicable to the successful bidder and the ensuing procurement contract. Documents are only applicable to the successful bidder and the ensuing procurement contract. Documents applicable to the procurement that will result from this Invitation for Bids are designated by a check box (☒). Unless otherwise indicated, the referenced documents are located at the end of this Invitation for Bids.

- Purchasing General Conditions** – The DASNY Purchasing General Conditions contains terms and conditions of purchases made by DASNY. It is recommended that this document be reviewed fully.
- M/WBE Utilization Plan and Request for Waiver** - Minority and Women-Owned Business Enterprise (M/WBE) goals for this project are 0% and 0%, respectively. The successful bidder shall be required to complete a Utilization Plan or Request for Waiver, to be approved by DASNY’s Opportunity Programs Group. Reference Purchasing General Conditions, Article XIX, Affirmative Action for Contracts Mr. Michael Clay, DASNY Opportunity Programs Group at (518) 257-3464, is available to assist all bidders in attaining these goals. *Reference the enclosed “Good Faith Efforts Guidelines”.*
- Supplemental General Requirements** – Attached (if applicable) are the Supplemental General Requirements (SGRs) which provide important logistical information and additional conditions which govern this procurement. Please read these SGRs carefully.
- Form of DASNY Contract** – The procurement resulting from the Invitation for Bids will be executed through a DASNY purchase order and a related contract. The contract executed with the successful bidder will be in the same substantial form as the attached “Form of Contract”. Note that this Invitation for Bids and any response to such will be annexed as binding terms of the purchase agreement.
- Certificate of Insurance** (*sample enclosed*) – The successful bidder will be required to provide a Certificate of Insurance pursuant to Article XIV of the enclosed Purchasing General Conditions. The certificate shall name DASNY and other designated parties as additional insureds.

SUPPLEMENTAL SPECIFICATIONS CONTINUED

- Worker’s Compensation / Disability Insurance** – The successful proposer will be required to provide specific documentation with respect to Worker’s Compensation and Disability Insurance pursuant to Article XIV of the enclosed Purchasing General Conditions. Requirements are detailed in the enclosed “Workers’ Compensation and Disability Benefits Requirements” document.

- Prevailing Wage Schedule** – NYS Labor Law requires all wages paid by contractors and subcontractors on public work projects be paid at the prevailing wage rates. Enclosed is the current rate schedule for the appropriate county. Contractors and Subcontractors are responsible for obtaining current rates throughout the course of the project. The NYS Department of Labor (NYS DOL) updates these rates on July 1st of each year. Current rates can be obtained on the NYS DOL website (www.labor.state.ny.us) or by fax at (518) 485-1870. Note that an executed Contractor and Subcontractor Certification and certified payrolls, which include the hours and days worked by each workman, laborer or mechanic, the occupation at which he worked, the hourly wage rate paid and the supplements paid or provided, must be submitted with each and every payment requisition. **DASNY will not process an invoice without this information.** Forms are available on the DASNY website:
<http://www.dasny.org/construc/forms2/vendors.php>

- Labor and Material Payment Bond** – The successful bidder must be prepared to provide surety bonds prior to award in accordance with Article XIV of the DASNY Purchasing General Conditions. The costs of these bonds are to be separately stated in the total bid price as indicated on the Bid Breakdown and Schedule.

- Performance Bond** – The Successful bidder must be prepared to provide surety bonds prior to award in accordance with Article XIV of DASNY Purchasing General Conditions. The costs of these bonds are to be separately stated in the total bid price as indicated on the Bid Breakdown and Schedule.

- Standard Vendor Responsibility Questionnaire (SVRQ)** – The successful proposer, in accordance with Article XXII of DASNY Purchasing General Conditions, will be required to complete the enclosed SVRQ. The award of a contract will be subject to a review of the information contained in these forms.



SUPPLEMENTAL SPECIFICATIONS CONTINUED

- NYS Uniform Contracting Questionnaire (UCQ)** – The successful proposer will be required to complete the enclosed UCQ. The award of a contract will be subject to a review of the information contained in these forms.

- DASNY Contractor and Consultant Questionnaire (CCQ)** – The successful proposer will be required to complete the enclosed CCQ. The award of a contract will be subject to a review of the information contained in these



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Supplemental General Requirements

Requests for Information:

All questions pertaining to Re-Bid No. 659 – Furnish and Deliver an Air Handling Unit are due no later than 4:00 P.M. on April 1, 2020 to tgraffeo@dasny.org. RFI Responses will be posted via Addenda to DASNY's Website in the Attachments Section of the Bid Opportunity Page for Re-Bid No. 659.

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Detailed Specifications

SECTION 233300 - AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Manual volume dampers.
 - 2. Control dampers.
 - 3. Fire dampers.
 - 4. Turning vanes.
 - 5. Duct-mounted access doors.
 - 6. Flexible connectors.
 - 7. Duct Silencer
 - 8. Duct accessory hardware.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. For duct silencers, include pressure drop and dynamic insertion loss data. Include breakout noise calculations for high transmission loss casings.
- B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.
 - 1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
 - a. Special fittings.
 - b. Manual volume damper installations.
 - c. Control-damper installations.
 - d. Fire-damper, smoke-damper, combination fire- and smoke-damper, ceiling, and corridor damper installations, including sleeves; and duct-mounted access doors and remote damper operators.
 - e. Duct security bars.
 - f. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which ceiling-mounted access panels and access doors required for access to duct accessories are shown and coordinated with each other, using input from Installers of the items involved.
- B. Source quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For air duct accessories to include in operation and maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Fusible Links: Furnish quantity equal to 10 percent of amount installed.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

2.2 MATERIALS

- A. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
 - 1. Galvanized Coating Designation: G60 G90.
 - 2. Exposed-Surface Finish: Mill phosphatized.
- B. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304, and having a No. 2 finish for concealed ducts and finish for exposed ducts.
- C. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

- D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.3 MANUAL VOLUME DAMPERS

A. Standard, Steel, Manual Volume Dampers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aire Technologies.
 - b. American Warming and Ventilating; a Mestek Architectural Group company.
 - c. Flexmaster U.S.A., Inc.
 - d. Flex-Tek Group.
 - e. McGill AirFlow LLC.
 - f. Nailor Industries Inc.
 - g. Pottorff.
 - h. Ruskin Company.
 - i. Safe Air - Dowco Products.
 - j. Trox USA Inc.
 - k. United Enertech Corporation.
 - l. Vent Products Co., Inc.
2. Standard leakage rating.
3. Suitable for horizontal or vertical applications.
4. Frames:
 - a. Frame: Hat-shaped, 0.094-inch thick, galvanized sheet steel.
 - b. Mitered and welded corners.
 - c. Flanges for attaching to walls and flangeless frames for installing in ducts.
5. Blades:
 - a. Multiple or single blade.
 - b. Parallel- or opposed-blade design.
 - c. Stiffen damper blades for stability.
 - d. Galvanized steel, 0.064 inch thick.
6. Blade Axles: Galvanized steel.
7. Bearings:
 - a. Oil-impregnated bronze.
 - b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
8. Tie Bars and Brackets: Galvanized steel.

2.4 CONTROL DAMPERS

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. American Warming and Ventilating; a Mestek Architectural Group company.
 - b. Flex-Tek Group.
 - c. McGill AirFlow LLC.
 - d. Greenheck Fan Corporation
 - e. Nailor Industries Inc.
 - f. Pottorff.
 - g. Ruskin Company.
 - h. Safe Air - Dowco Products.
 - i. United Enertech Corporation.
 - j. Vent Products Co., Inc.
- B. Low-leakage rating, with linkage outside airstream, and bearing AMCA's Certified Ratings Seal for both air performance and air leakage.
- C. Frames:
1. Hat shaped.
 2. 0.05-inch thick stainless steel.
 3. Mitered and welded corners.
- D. Blades:
1. Multiple blade with maximum blade width of 6 inches.
 2. Parallel-blade design.
 3. Stainless steel.
 4. 0.064 inch thick single skin.
 5. Blade Edging: Closed-cell neoprene.
 6. Blade Edging: Inflatable seal blade edging, or replaceable rubber seals.
- E. Blade Axles: 1/2-inch diameter; stainless steel; blade-linkage hardware of zinc-plated steel and brass; ends sealed against blade bearings.
1. Operating Temperature Range: From minus 40 to plus 200 deg F.
- F. Bearings:
1. Stainless-steel sleeve.
 2. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
 3. Thrust bearings at each end of every blade.
- 2.5 FIRE DAMPERS
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aire Technologies.
 - b. American Warming and Ventilating; a Mestek Architectural Group company.
 - c. Nailor Industries Inc.
 - d. Pottorff.
 - e. Ruskin Company.
 - f. Safe Air - Dowco Products.
 - g. United Enertech Corporation.
 - h. Vent Products Co., Inc.

- B. Type: Static; rated and labeled according to UL 555 by an NRTL.
- C. Fire Rating: 2 hours.
- D. Frame: Curtain type with blades inside airstream; fabricated with roll-formed, 0.034-inch thick galvanized steel; with mitered and interlocking corners.
- E. Mounting Sleeve: Factory- or field-installed, galvanized sheet steel.
 - 1. Minimum Thickness: 0.138 inch thick, as indicated, and of length to suit application.
 - 2. Exception: Omit sleeve where damper-frame width permits direct attachment of perimeter mounting angles on each side of wall or floor; thickness of damper frame must comply with sleeve requirements.
- F. Mounting Orientation: Vertical or horizontal as indicated.
- G. Blades: Roll-formed, interlocking, 0.024-inch thick, galvanized sheet steel. In place of interlocking blades, use full-length, 0.034-inch thick, galvanized-steel blade connectors.
- H. Heat-Responsive Device: Replaceable, 165 deg F rated, fusible links.

2.6 TURNING VANES

- A. Standard, Steel, Turning Vanes:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aero-Dyne Sound Control Co.
 - b. CL WARD & Family Inc.
 - c. Ductmate Industries, Inc.
 - d. Duro Dyne, Inc.
 - e. Elgen Manufacturing.
 - f. Hardcast, Inc.
 - g. METALAIRE, Inc
 - h. SEMCO, LLC; part of FlaktGroup
 - i. Ward Industries; a brand of Hart & Cooley, Inc.
- B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
 - 1. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.
- C. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 4-3, "Vanes and Vane Runners," and 4-4, "Vane Support in Elbows."
- D. Vane Construction: Single wall.

2.7 DUCT-MOUNTED ACCESS DOORS

A. Standard Access Door:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aire Technologies.
 - b. American Warming and Ventilating; a Mestek Architectural Group company.
 - c. Flexmaster U.S.A., Inc.
 - d. Flex-Tek Group.
 - e. Greenheck Fan Corporation
 - f. Nailor Industries Inc.
 - g. Pottorff.
 - h. United Enertech Corporation.

B. Duct-Mounted Access Doors: Fabricate access panels according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 7-2, "Duct Access Doors and Panels," and 7-3, "Access Doors - Round Duct."

1. Door:

- a. Double wall, rectangular.
- b. Galvanized sheet metal with insulation fill and thickness as indicated for duct pressure class.
- c. Vision panel.
- d. Hinges and Latches: 1-by-1-inch butt or piano hinge and cam latches.
- e. Fabricate doors airtight and suitable for duct pressure class.

2. Frame: Galvanized sheet steel, with bend-over tabs and foam gaskets.

3. Number of Hinges and Locks:

- a. Access Doors Less Than 12 Inches Square: No hinges and two sash locks.
- b. Access Doors up to 18 Inches Square: Two hinges and two sash locks.

2.8 FLEXIBLE CONNECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. CL WARD & Family Inc.
2. Ductmate Industries, Inc.
3. Duro Dyne Inc.
4. Elgen Manufacturing.
5. Hardcast, Inc.
6. Ventfabrics, Inc.
7. Ward Industries; a brand of Hart & Cooley, Inc.

B. Materials: Flame-retardant or noncombustible fabrics.

C. Coatings and Adhesives: Comply with UL 181, Class 1.

- D. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.
1. Minimum Weight: 26 oz./sq. yd..
 2. Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
 3. Service Temperature: Minus 40 to plus 200 deg F.
- E. Thrust Limits: Combination coil spring and elastomeric insert with spring and insert in compression, and with a load stop. Include rod and angle-iron brackets for attaching to fan discharge and duct.
1. Frame: Steel, fabricated for connection to threaded rods and to allow for a maximum of 30 degrees of angular rod misalignment without binding or reducing isolation efficiency.
 2. Outdoor Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
 4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
 6. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
 7. Coil Spring: Factory set and field adjustable for a maximum of 1/4-inch movement at start and stop.

2.9 DUCT SILENCERS

- A. Manufacturers: Subject to compliance with requirements (Basic of design- Vibro-Acoustics), available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. IAC Acoustics; a division of Sound Seal.
 2. McGill AirFlow LLC.
 3. Metal Form Mfg/Commercial Acoustics.
 4. Price Industries.
 5. Ruskin Company.
- B. General Requirements:
1. Silencers shall be of the size, configuration, capacity and acoustic performance as scheduled on the drawings. All silencers shall be factory fabricated and supplied by the same manufacturer.
 2. Silencer inlet and outlet connection dimensions must be equal to the duct sizes shown on the drawings. Duct transitions at silencers are not permitted unless shown on the contract drawings.
 3. Silencers shall be constructed in accordance with ASHRAE and SMACNA standards for the pressure and velocity classification specified for the air distribution system in which it is installed. Material gauges noted in other sections are minimums. Material gauges shall be increased as required for the system pressure and velocity classification. The silencers shall not fail structurally when subjected to a differential air pressure of 8 inches water gauge.

4. All casing seams and joints shall be lock-formed and sealed or stitch welded and sealed to provide leakage-resistant construction. Airtight construction shall be achieved by use of a duct-sealing compound supplied and installed by the contractor at the jobsite.
 5. All perforated steel shall be adequately stiffened to insure flatness and form. All spot welds shall be painted.
 6. Fire-Performance Characteristics: Silencer assemblies, including acoustic media fill, Vibar™ film liner, sealants, and acoustical spacer, shall have flame-spread index not exceeding 25 and smoke-developed index not exceeding 50 when tested according to ASTM E 84, NFPA 255 or UL 723.
 7. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2007.
- C. Inner perforated metal liner: ASTM A 653/A 653M, G90 galvanized sheet steel.
1. Rectangular Elbow Silencers: 22 gauge.
- D. Principal Sound-Absorbing Mechanism:
1. Dissipative silencers:
 - a. Model REFL type with acoustic media. Media shall be of acoustic quality, shot-free glass fiber insulation with long, resilient fibers bonded with a thermosetting resin. Glass fiber density and compression shall be as required to insure conformance with laboratory test data. Glass fiber shall be packed with a minimum of 15% compression during silencer assembly. Media shall be resilient such that it will not crumble or break and conform to irregular surfaces. Media shall not cause or accelerate corrosion of aluminum or steel. Mineral wool will not be permitted as a substitute for glass fiber.
- E. HTL Casings: Where indicated on the silencer schedule, silencers shall have high transmission loss (HTL) walls externally applied and completely sealed to the silencer casing by the silencer manufacturer to assure quality-controlled transmission loss. If requested by the Engineer, breakout noise calculations for each air handling and fan system shall be provided with the silencer submittal to insure compliance with the room noise criteria. Breakout noise calculations shall be based on the sound power levels of the specified equipment.
- A. Capacities and Characteristics:
1. Configuration: 90-degree elbow.
 2. Shape: Rectangular.
 3. Attenuation Mechanism: Acoustical glass fiber with protective film liner.
 4. Maximum Pressure Drop: 0.35-inch wg.

2.10 DUCT ACCESSORY HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.

- B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.
- C. Install volume dampers at points on supply systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
 - 1. Install steel volume dampers in steel ducts.
- D. Set dampers to fully open position before testing, adjusting, and balancing.
- E. Install silencer according to manufacturer's written installation instructions.
- F. Install fire dampers according to UL listing.
- G. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:
 - 1. On both sides of duct coils.
 - 2. At outdoor-air intakes plenums.
 - 3. At drain pans and seals.
 - 4. Downstream from manual volume dampers, and equipment.
 - 5. Adjacent to and close enough to fire dampers, to reset or reinstall fusible links. Access doors for access to fire dampers having fusible links shall be pressure relief access doors and shall be outward operation for access doors installed upstream from dampers and inward operation for access doors installed downstream from dampers.
 - 6. At each change in direction and at maximum 50-foot spacing.
 - 7. Upstream from turning vanes.
 - 8. Elsewhere as indicated.
- H. Install access doors with swing against duct static pressure.
- I. Access Door Sizes:
 - 1. One-Hand or Inspection Access: 8 by 5 inches.

- J. Install flexible connectors to connect ducts to equipment.
- K. For fans developing static pressures of 5-inch wg and more, cover flexible connectors with loaded vinyl sheet held in place with metal straps.
- L. Connect diffusers to ducts directly with maximum lengths of flexible duct clamped or strapped in place.
- M. Install duct test holes where required for testing and balancing purposes.
- N. Install thrust limits at centerline of thrust, symmetrical on both sides of equipment. Attach thrust limits at centerline of thrust and adjust to a maximum of 1/4-inch movement during start and stop of fans.

3.2 FIELD QUALITY CONTROL

A. Tests and Inspections:

- 1. Operate dampers to verify full range of movement.
- 2. Inspect locations of access doors and verify that purpose of access door can be performed.
- 3. Operate fire, smoke, and combination fire and smoke dampers to verify full range of movement and verify that proper heat-response device is installed.
- 4. Inspect turning vanes for proper and secure installation.
- 5. Operate remote damper operators to verify full range of movement of operator and damper.
- 6. Ensure duct silencers are installed with airflow arrows in direction of airflow.
- 7. The manufacturer shall test the silencer(s) as indicated in the silencer schedule. The engineer shall be notified of the test date at least two weeks in advance and the test may be witnessed by the engineer. Test shall show compliance with the project criteria and is subject to engineer approval.
- 8. Test facilities and test reports shall be open to inspection upon request from the Engineer. Silencer performance must have been substantiated by laboratory testing according to ASTM E-477-06a and so certified when submitted for approval. The aero-acoustic laboratory must be NVLAP accredited for the ASTM E-477-06a test standard. A copy of the accreditation certificate must be included with the submittals. Data from non-NVLAP accredited test facilities will not be accepted.

END OF SECTION 233300

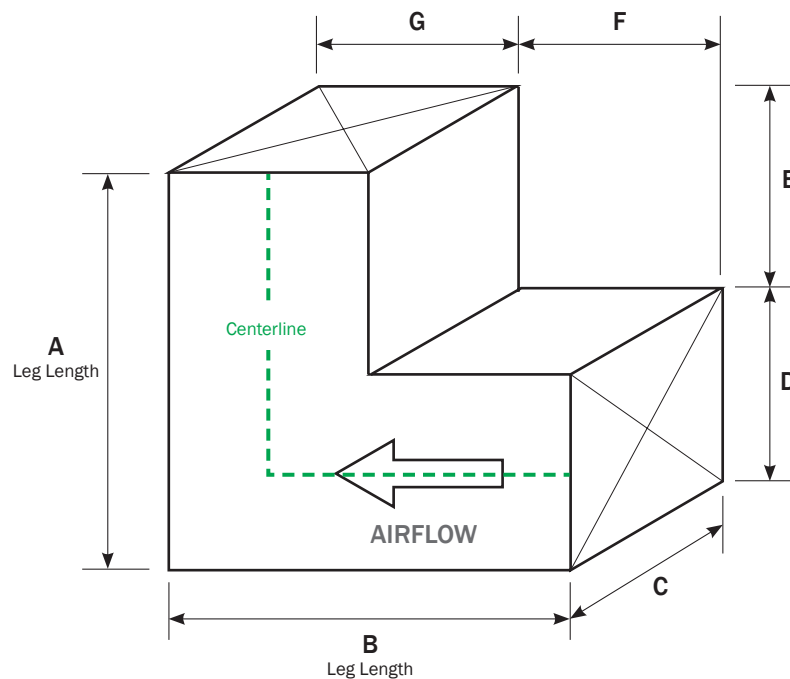
ELBOW SILENCER CENTER-LINE DEFINITION

Vibro-Acoustics' **RED** (Rectangular Elbow Dissipative), **REFL** (Rectangular Elbow Film Lined) and **RENM** (Rectangular Elbow No-Media) silencers incorporate a full 90 degree and/or a partial bend to fit the duct system configuration.

Vibro-Acoustics defines the length of an elbow silencer as being the dimension measured along the geometric centerline of the silencer in direction of airflow. This centerline length may be determined using the following formula:

$$\text{Centerline Length} = (A - (D/2)) + (B - (G/2))$$

Vibro-Acoustics schedules and submittals showing the length of elbow silencers are referring to this centerline length.



2" slip connection at each end unless otherwise noted.
This drawing is a pictorial representation only.

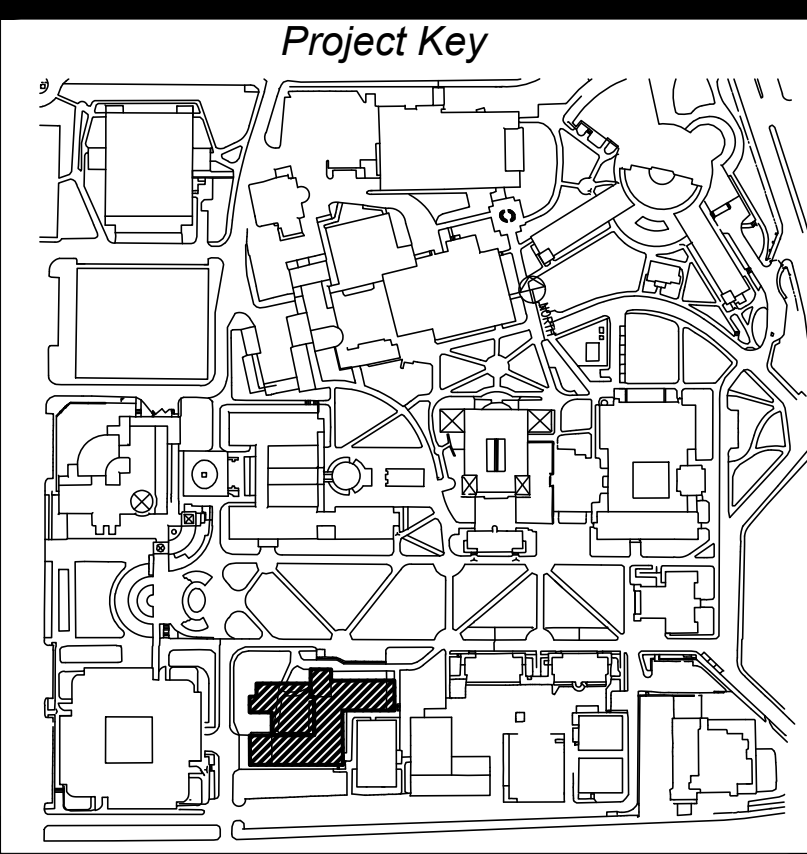
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Rev No.	Description	Date
1	CONSTRUCTION DOCUMENTS	12-19-19

DOB JOB #

Client:
CUNY
THE CITY UNIVERSITY OF NEW YORK
555 WEST 57th STREET
NEW YORK, NEW YORK, 10019

Project Title:
QUEENS COLLEGE
REHABILITATION, VIBRATION, SPRING SPACE & ASBESTOS WORK
66-50 KISSENA BLVD.,
FLUSHING, NY 11367

Drawing Title:
SCHEDULE SHEET

Drawn By: E.S. Checked By: G.S. Approved By: G.S. Date: 08/30/2019

Seal & Signature: GENESYS Project No: 036122-100 DASNY Project No: 306680999

Drawing Number: **M-900.00**

CONSTRUCTION DOCUMENTS FULL SCALE DWG. SIZE 30"x42" Drawing ## of ##

SPLIT-AIR HANDLING UNIT SCHEDULE																												BASIS OF DESIGN: TRANE		
UNIT No.	LOCATION	AREA SERVED	TOTAL CFM	FAN DATA								ELECTRIC DATA PER SUPPLY FAN MOTOR (EACH)								DX-COOLING COIL						STEAM-HUMIDIFIER				
				NO. OF FANS	FAN TYPE	E.S.P. (IN. H2O)	T.S.P. (IN. H2O)	RPM	BHP	HP	VOLT/Hz/PH	RPM	NO OF CIRCUIT	FLA (A)	MCA (A)	FUSE SIZE (A)	SENSIBLE CAPACITY (MBTU/HR)	TOTAL CAPACITY (MBTU/HR)	EAT. DB (°F)	EAT. WB (°F)	LAT. DB (°F)	LAT. WB (°F)	F.V. (FT/MIN)	A.P.D. (IN. H2O)	REFRIGERANT TYPE	EAT. RH (%)	LAT. RH (%)	EAT. DB (°F)	STEAM FLOW (LB/HR)	COND. LOSS (LB/HR)
AHU-1	2ND FLOOR LOW ROOF	200-A,B&C, 201& 207	12,000	4	FEG75	3	5.17	2740	16	5	460/60/3	1800	1	32.8	34.85	40	487	886	92	76	55	54.9	452	0.64	R-410	25	50	78	287	19.16

SPLIT-AIR HANDLING UNIT SCHEDULE (CONTINUED)																												BASIS OF DESIGN: TRANE	
STEAM PRE-HEAT COIL								STEAM HEAT COIL								PANEL FILTER						OPERATING WEIGHT (LBS)	MODEL	REMARKS					
TOTAL CAPACITY (MBTU/HR)	EAT. DB (°F)	LAT. DB (°F)	F.V. (FT/MIN)	AIR P.D. (IN. H2O)	PRESSURE (PSIG)	COND. (LB/HR)	STEAM P.D. (IN. H2O)	TOTAL CAPACITY (MBTU/HR)	EAT. DB (°F)	LAT. DB (°F)	F.V. (FT/MIN)	A.P.D. (IN. H2O)	PRESSURE (PSIG)	COND. (LB/HR)	S.P.D. (IN. H2O)	TYPE	EFFICIENCY (%)	CLEAN P.D. (IN. H2O)	DIRTY P.D. (IN. H2O)	MEAN P.D. (IN. H2O)									
650	0	50	474	0.09	5	677	8.581	585	50	95	474	0.106	5	609	6.9	PLEATED (MERV 13)	80	0.18	1	0.59	8500	PSCA	1-8						

- REMARKS:
- EXTERNAL PIPE CABINET FOR STEAM VALVE.
 - SUPPLY FAN MOTOR: DIRECT DRIVE W/VFD.
 - BACNET I/P INTERFACE.
 - UNIT CONTROLLER- TRANE TD7- DISCHARGE AIR CONTROL.
 - W/BACNET W/DISPLAY.
 - COOLING CONTROL- RELIATEL.
 - STAINLESS STEEL DRIP PAN.
 - HUMIDIFIERS SHALL BE PROVIDED WITH A CONTROL VALVE, INVERTED BUCKET STEAM TRAP, WYE STRAINER, AND TWO FLOAT AND THERMOSTATIC STEAM TRAPS SHIPPED LOOSE FOR FIELD INSTALLATION.
 - STANDARD MANUFACTURER WARRANTY FROM DATE OF ACCEPTANCE BY CUNY.

PACKAGED AIR-COOLED CONDENSING UNIT																						BASIS OF DESIGN: TRANE	
UNIT NO.	UNIT SERVE	REFRIGERATION EFFECT (MBTU/HR)	CAPACITY (TON)	POWER (KW)	EER	SUCTION TEMP (°F)	AMBIENT TEMP (°F)	CONDENSER				ELECTRICAL DATA						WEIGHT (LBS)	REFRIGERANT	MODEL NO.	REMARKS		
								COIL TYPE	FINS PER IN.	NO. OF CIRCUIT	FAN TYPE	QUANTITY	EMER. POWER (YES OR NO)	VOLT /PH/Hz.	MCA (A)	MOP (A)	RDE (A)					COMP. POWER (KW)	FAN POWER (KW)
ACC-1	AHU-1	1121.31	80	102	11	44.0	95.0	ALUMINUM TUBE MICRO-CHANNEL	18	2	STANDARD	1	NO	460/3/60	174	200	175	95	7.04	5800	R410A	RCAUC80-1	1-3

- REMARKS:
- SPRING VIBRATION ISOLATORS
 - SUCTION SERVICE VALVE
 - BLEED THERMAL EXPANSION VALVE
 - STANDARD MANUFACTURER WARRANTY FROM DATE OF ACCEPTANCE BY CUNY.

CONDENSATE PUMP AND RECEIVER SCHEDULE														BASIS OF DESIGN: SHIPCO PUMPS	
UNIT No.	LOCATION	SERVICE	PUMP DATA				MOTOR DATA		RECEIVER CAPACITY (GAL.)	MODEL	REMARKS				
			GPM (EACH)	DISCH. PRESS. (PSIG)	RPM	OPER. TEMP. (°F)	No. OF PUMPS	HP (EACH)				VOLT/PH			
CP-1	REMSEN PIPE TUNNEL	AHU-1	3	30	3500	180	1	3/4	208/3	16	63 DSD-MU3	1-5			

- REMARKS:
- STAINLESS STEEL CONSTRUCTION.
 - BASKET INLET STRAINER, GAUGE GLASS ASSEMBLY, DIAL THERMOMETER, DISCHARGE PRESSURE GAUGE, HIGH WATER ALARM SWITCH.
 - ALL UNIT SHALL BE COMPLETELY ASSEMBLED, PIPED, WIRED AND TESTED BEFORE SHIPMENT.
 - UNIT WILL BE FURNISHED WITH REMOVABLE SUPPORT STAND WHICH WILL ELEVATE RECEIVER 12" FROM BASE.
 - STANDARD MANUFACTURER WARRANTY FROM DATE OF ACCEPTANCE BY CUNY.

SPLIT AIR COOLED HEAT PUMP SYSTEM SCHEDULE																								BASIS OF DESIGN: MITSUBISHI										
UNIT No.	LOCATION	AREA SERVED	CFM RANGE	TOTAL CAPACITY				POWER INPUT		MARK No.	CFM	OUTDOOR AIR D.B.	MIN. OPER. TEMP.	CONDENSER				EVAPORATOR				DIMENSION WxDxH (IN.)	E.A.T. D.B.	E.A.T. W.B.	COOLING L.A.T. D.B.	HEATING L.A.T. D.B.	MOTOR OUTPUT KW	MOTOR FLA	VOLT /PH/Hz.	DIMENSION WxDxH (IN.)	EFFICIENCY (SEER)	CONDENSING UNIT MODEL No.	EVAPORATOR MODEL No.	REMARKS
				COOLING (MBH)	HEATING (MBH)	COOLING (KW)	HEATING (KW)	CONDENSER FAN						COMPRESSOR		MOTOR FLA	VOLT /PH/Hz.																	
				MARK No.	CFM	OUTDOOR AIR D.B.	MIN. OPER. TEMP.	MCA	MOCQ					TYPE	RLA			LRA	MODEL No.															
AC-R1	1ST FLOOR	RM 104	700	34.2	38	3.3	3.7	ACC-R1	3880	95°F	0°F	25	31	INVERTER	8	13	MNB33FBRMC-L	42x17x56	95	76	75	70	0.56	0.57	208/1/60	51x19x15	18.8	PUZ-A36NHA (BS)	PKA-A36FA	1-5				

- REMARKS:
- LINESET-TWIN TUBE-INSULATION
 - HEAVY DUTY WALL MOUNTING BRACKET FOR OUTDOOR UNIT-COATED STEEL. MODEL-QSWB200M-1
 - BACNET AND MODBUS INTERFACE
 - FLARED CONNECTION
 - WARRANTY- 5 YEARS FROM THE DATE OF ACCEPTANCE FROM CUNY.

EXHAUST FAN SCHEDULE																				BASIS OF DESIGN: STROBIC AIR	
ITEM NO.	UNIT NO.	AREA SERVED	LOCATION	NO OF FAN	LABORATORY EXHAUST (CFM)	STATIC PRESSURE IN WG	FAN (RPM)	INLET FLOW RATE (CFM)	BYPASS FLOW (CFM)	ENTRAINED FLOW (CFM)	POWER	EMER. POWER (YES OR NO)	SINGLE FAN PERFORMANCE				MODEL NO.	OPERATING WEIGHT	REMARKS		
													BHP	HP	FAN FLOW RATE (CFM)	TOTAL FLOW RATE (CFM)				NOZZLE VELOCITY (CFM)	DILUTION RATIO (%)
1	EF-1A&1B	200-A,B&C, 201, 207, 000, 000A, 000B	ROOF	2	15,000	2.5	1200	15,000	1818	10090	460/3/60	NO	7	7.5	8400	13454	4426	179	TS25075A12	5088	1 THRU 8

- REMARKS:
- FAN SHALL BE SPARK RESISTANT AND EXPLOSION PROOF CONSTRUCTION.
 - ISOLATION MOTORIZED DAMPER.
 - BYPASS MOTORIZED DAMPER.
 - BYPASS RAIN HOOD.
 - MIXING FLENUM.
 - DISCONNECT SWITCH/FAN.
 - OUTLET NOZZLE SILENCER.
 - STANDARD MANUFACTURER WARRANTY FROM DATE OF ACCEPTANCE BY CUNY.

DUCT SILENCER																		BASIS OF DESIGN: VIBRO-ACOUSTICS	
UNIT NO.	AHU TAG	LOCATION	NO	FLOW RATE (CFM)	STATIC PRESSURE IN WG	PD IN WG	DIMENSION LxWxH (IN.)	MIN. INSERTION LOSS								MANUFACTURER	MODEL NO.	OPERATING WEIGHT	REMARKS
								63	125	250	500	1000	2000	4000	8000				
S-1	AHU-1	LOWER ROOF	1	12,000	0.29	0.26	84x36x30	9	14	19	22	31	28	23	20	VIBRO-ACOUSTICS	TS25075A12	325	1 THRU 5

- REMARKS:
- FOR NON BASIS OF DESIGN, PROVIDE P.E STAMP CALS TO PROVIDE 20 DB REDUCTION IN THE VIVARIUM LAGS.
 - FOR NON BASIS OF DESIGN, PROVIDE P.E STAMP CALS TO PROVIDE PRESSURE DROP WITH SYSTEM EFFECTS.
 - REFL = RECTANGULAR ELBOW FILM LINED SILENCER WITH G90, 18 GA. CASING AND 22 GA. PERF. MATERIAL CONSTRUCTION.
 - VIBAR FILM LINING INCLUDED. VIBAR FILM IS FIRE/SMOKE RATED AND MEETS NFPA 90A AND ASTM E84 STANDARDS.
 - FOR NON BASIS OF DESIGN, CONTRACTOR IS RESPONSIBLE FOR MEETING THE REQUIRED DB REDUCTION.

REGISTERS AND DIFFUSERS						BASIS OF DESIGN: TITUS	
TYPE	CFM RANGE	NECK SIZE	NOMINAL FACE SIZE	MODEL No.	REMARKS		
CD-1	100-180	7"	24"x24"	TLF-SS	1		
CD-2	100-180	7"	24"x48"	TLF-SS	1		
CD-3	190-300	10"	24"x48"	TLF-SS	1		
ER-1	100-300	10"x10"	12"x12"	PAR-SS	1		
ER-2	100-300	10"x10"	24"x24"	PAR-SS	1		
ER-3	300-550	12"x12"	24"x24"	PAR-SS	1		

- REMARKS:
- STAINLESS STEEL

ELECTRIC AIR HANDLING UNIT SCHEDULE																												BASIS OF DESIGN: TRANE				
UNIT No.	LOCATION	AREA SERVED	TOTAL CFM	COOLING COIL DATA						HEATING COIL DATA				FAN DATA				ELECTRICAL DATA						MODEL	DIMENSION LxWxH (FT.)	WEIGHT (LBS)	SOUND (dBA)	EER	REMARKS			
				ENT. DB (°F)	ENT. WB (°F)	LAT. DB (°F)	LAT. WB (°F)	TOTAL COOLING (MBTU/HR)	SEN. COOLING (BTU/HR)	MIN. DEW POINT (°F)	HEATING CAPACITY (KW)	EAT (°F)	LAT (°F)	STATIC PRESS. (IN.W.G.)	RPM	HP	RPM	BHP	DISCHARGE CONF.	EMER. POWER (YES OR NO)	HP	VOLT /PH/Hz.	MCA (A)							MFS (A)	FLA (A)	
AHU-3	FIRST FLOOR	CAGE AREA	2000	92	76	55	54.9	138	79	6	48	0	83	2.24	1944	1.5	1800	1	VERTICAL	NO	1.5	460/3/60	84.8	90	67.8	HORIZON	OADG010A3	14x5x6	3050	88.7	13.1	1-13

- REMARKS:
- HEAT: FIN & TUBE MODULATING HORH ELECTRIC.
 - ELECTRIC HEATING COIL WITH SCR(MODULATING CONTROL).
 - SUPPLY FAN MOTOR: DIRECT DRIVE W/VFD.
 - UNIT CONTROLLER- TRANE TD7- DISCHARGE AIR CONTROL.
 - W/BACNET W/DISPLAY.
 - COOLING CONTROL- RELIATEL.
 - STAINLESS STEEL DRIP PAN.
 - SMOKE DETECTOR.
 - SPACE TEMP THERMOSTAT.
 - HORIZONTAL DISCHARGE CURB-PRIMARY CABINET.
 - ADJUSTABLE DISCHARGE AIR TEMP. CONTROL.
 - FILTER- MERV-13.
 - SOUND ATTENUATION PACKAGE.
 - STANDARD MANUFACTURER WARRANTY FROM DATE OF ACCEPTANCE BY CUNY.