

CITY OF ST. LOUIS

OFFICE OF THE SUPPLY COMMISSIONER
 1200 MARKET ST RM 324
 ST LOUIS MO 63103-2842



REQUEST FOR QUOTE
 90011Q0053

PAGE
 1

ADDRESS CORRESPONDENCE TO

... We agree to furnish the following articles to the City of St. Louis, free of any extra charges, in the quantity named and at the prices respectively stated:

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BOARD OF PUBLIC SERVICE
 1200 MARKET STREET
 ROOM 301 MO
 ST LOUIS MO

63103
 314-622-3729

SEE TERMS AND CONDITIONS ON THE REVERSE SIDE OF THIS QUOTATION SHEET.

DATE PRINTED 06/08/11	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
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REPLY DUE BY: 06/30/11 12:00 O'CLOCK NOON

NEEDED BY DATE	QUANTITY	UNIT	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
	REQ LINE NUMBER : 0001					
	1	LOT				
	BLANKET REQUISITION FOR AIR HANDLING UNITS AS SHOWN BELOW (PER ATTACHED SPECIFICATIONS)					
	QTY 1: AIR HANDLING UNIT (AHU-27) AT 50,000 CFM AND 2.0" EXTERNAL STATIC PRESSURE WITH RETURN FAN, PLUS ACCESSORIES: BRAND: \$ /E					
	SECTION TOTAL \$					
	QTY 1: AIR HANDLING UNIT (AHU-28) AT 37,800 CFM AND 2.0" EXTERNAL STATIC PRESSURE WITHOUT RETURN FAN, PLUS ACCESSORIES: BRAND: \$ /EA					
	SECTION TOTAL \$					
	QTY 1: AIR HANDLING UNIT (AHU-29) AT 37,800 CFM AND 2.0" EXTERNAL STATIC PRESSURE WITHOUT RETURN FAN, PLUS ACCESSORIES: BRAND: \$ /EA					
	SECTION TOTAL \$					
TOTAL →						

NAME OF FIRM	STATE DELIVERY:	COMPTROLLER	Date
ADDRESS	CALENDAR DAYS		
CITY	STATE	SIGNED BY:	SUPPLY COMMISSIONER
PHONE	Area Code ()		Date

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NEEDED BY DATE	QUANTITY	UNIT	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
	QTY 1:	AIR HANDLING UNIT	(AHU-30)	AT 18,700 CFM AND 2.0" EXTERNAL STATIC PRESSURE WITHOUT RETURN FAN, PLUS ACCESSORIES:		
		BRAND:			\$	/E
		SECTION TOTAL			\$	
	QTY 1:	AIR HANDLING UNIT	(AHU-31)	AT 30,900 CFM AND 2.0" EXTERNAL STATIC PRESSURE WITHOUT RETURN FAN, PLUS ACCESSORIES:		
		BRAND:			\$	/EA
		SECTION TOTAL			\$	
	QTY 1:	AIR HANDLING UNIT	(AHU-32)	AT 30,900 CFM AND 2.0" EXTERNAL STATIC PRESSURE WITH RETURN FAN, PLUS ACCESSORIES:		
		BRAND:			\$	/E
		SECTION TOTAL			\$	
	QTY 1:	OUTDOOR AIR HANDLING UNIT	(AHU-33)	AT 50,000 CFM		
	TOTAL →					

NAME OF FIRM	STATE DELIVERY:	COMPTROLLER	Date
ADDRESS	CALENDAR DAYS		
CITY	STATE	SIGNED BY:	SUPPLY COMMISSIONER
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REPLY DUE BY: 06/30/11 12:00 O'CLOCK NOON

NEEDED BY DATE	QUANTITY	UNIT	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
	AND 2.5" EXTERNAL STATIC PRESSURE WITH VFD, MINIMUM OUTDOOR AIR DAMPERS, SILENCER AND RETURN FAN, PLUS SEISMIC ROOF CURB AND ACCESSORIES:					
	BRAND:			\$	/EA	
	SECTION TOTAL		\$			
	QTY 1: OUTDOOR AIR HANDLING UNIT (AHU-34) AT 30,000 CFM AND 2.5" EXTERNAL STATIC PRESSURE WITH VFD, MINIMUM OUTDOOR AIR DAMPERS, SILENCER AND RETURN FAN, PLUS SEISMIC ROOF CURB AND ACCESSORIES:					
	BRAND:			\$	/EA	
	SECTION TOTAL		\$			
	BIDDER IS REQUIRED TO INDICATE BRAND AND PRICE IN SPACE LISTED BELOW EACH GROUPING. ALL QUESTIONS SHOULD DIRECTED TO SHARON COLEMAN. DEPT. CONTACT: JOE MCBRYAN 314-589-6636 NOTE: BID TOTAL MUST BE LISTED ON BOTTOM OF PAGE . STATE BEST GUARANTEED DELIVERY: A.R.O.					
					TOTAL →	

NAME OF FIRM	STATE DELIVERY:	COMPTROLLER	Date
ADDRESS	CALENDAR DAYS		
CITY STATE	SIGNED BY:	SUPPLY COMMISSIONER	Date
PHONE Area Code ()			

ADVERTISED BID CITY OF ST. LOUIS

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NEEDED BY DATE	QUANTITY	UNIT	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
<p>PLEASE RESPOND: VENDOR MUST COMPLETE, SIGN & RETURN THE ENCLOSED BUY AMERICAN FORM WITH THEIR BID.</p> <p>IT IS THE POLICY OF THE SUPPLY DIVISION THAT ALL BIDS/ CONTRACTS AWARDED IN THE AMOUNT OF \$500.00 AND ABOVE ADHERE TO THE MAYOR'S EXECUTIVE ORDER #28 WHICH REQUIRES MINIMUM UTILIZATION OF MINORITY OWNED BUSINESSES OF 25% AND WOMEN OWNED BUSINESSES OF 5%. ALL VENDORS MUST COMPLY WITH THIS POLICY AND ALL OTHER PROVISIONS OF EXECUTIVE ORDER NO. 28.</p> <p>ALL BIDS MUST INCLUDE COMPLETED "BUY AMERICAN" AND "MINORITY/WOMEN UTILIZATION STATEMENT" FORMS, AND ANY SUPPLEMENTAL INFORMATION REQUIRED. ANY QUESTIONS SHOULD BE DIRECTED TO THE BUYER.</p> <p>+++++ BIDS WILL BE AWARDED BASED ON OFFICIAL SPECIFICATIONS PROVIDED BY SUPPLY DIVISION ONLY & ANY RELATED ADDENDA. ALL INQUIRIES MUST BE IN WRITING (LETTER/E-MAIL/FAX) TO THE FOLLOWING BUYER: SHARON COLEMAN - COLEMANS@STLOUISCITY.COM FAX# 314-622-4141 . PHONE# 314-622-4596 +++++</p> <p>PLEASE TYPE NAME OF CONTACT PERSON FOR THIS BID: NAME: _____ FAX: _____ E-MAIL: _____</p>						
TOTAL →						

NAME OF FIRM	STATE DELIVERY:	COMPTROLLER	Date
ADDRESS	CALENDAR DAYS		
CITY	STATE	SIGNED BY:	SUPPLY COMMISSIONER Date
PHONE	Area Code ()		

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NEEDED BY DATE	QUANTITY	UNIT	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
<p>IF FREIGHT OR DELIVERY CHARGE TO BE BILLED, IT MUST BE INCLUDED IN THIS QUOTE OR IT WILL NOT BE PAID. () FREIGHT IS INCLUDED IN THE QUOTED UNIT PRICE. () WE WILL CHARGE FREIGHT/DELIVERY IN THE AMOUNT OF: \$ _____</p> <p>*****NEW BIDDING INFORMATION***** FOR ALL BIDS, THE CITY RESERVES THE RIGHT TO MAKE A SPLIT AWARD. IF A BIDDER DOES NOT WISH TO ACCEPT A SPLIT BID AWARD, HE/SHE MUST STATE "ALL OR NONE" ON BID OFFER, SEE BELOW. BIDDER MUST CHECK ONE OF FOLLOWING: ----- BIDDING "ALL OR NONE" ----- SPLIT AWARD ACCEPTABLE</p> <p>ALL BIDS MUST BE RETURNED IN SEALED ENVELOPE. FAXED BIDS, UNLESS SPECIFICALLY REQUESTED BY CITY, WILL BE REJECTED. IF UNCERTAIN, CONTACT BUYER NAMED HEREIN. ENVELOPE SHOULD BE MARKED WITH BID # & OPENING DATE.</p>						
TOTAL →						

NAME OF FIRM	STATE DELIVERY:	COMPTROLLER	Date
ADDRESS	CALENDAR DAYS		
CITY	STATE	SIGNED BY:	SUPPLY COMMISSIONER Date
PHONE	Area Code ()		

REQUEST FOR PROPOSAL

PART 1 - INSTRUCTIONS

1.1 INVITATION

- A. The City of Saint Louis Board of Public Service (hereinafter called the "City" or the "Owner") is soliciting Proposals for Air Handling Units and Related Equipment for America's Center. The air handling units and related equipment will be installed under a subsequent construction contract at the building site.
- B. The Engineering and Architectural firm of Ross & Baruzzini, Inc., (hereinafter called the "Engineer" or the "A/E") of St. Louis, Missouri (314-918-8383), is the design professional responsible for these specifications.
- C. Any questions related to receipt of Proposals shall be directed to the City, Mr. Joseph McBryan, P.E. (314/589-6636).
- D. The Air Handling Units and Related Equipment shall consist of modular packaged air-handling units with coils for indoor or outdoor installations; including fans, dampers, and filters; and seismic roof curbs for roof-mounted units. Refer to the attached specifications for more specific information and requirements for this equipment.

1.2 CONDITIONS OF CONTRACT

- A. The terms and conditions of the contract shall be as detailed in this document and its attachments.

1.3 SUBMISSION OF PROPOSALS

- A. Only certified agents or authorized factory sales offices (hereinafter called the "Respondent") of the manufacturers named in Section 15725P shall be qualified to submit a Proposal. Proposals will be received from the manufacturers listed. The manufacturers shall be responsible for the entire package consisting of air handling units, specified accessories, and field services.
- B. The City reserves the right to reject any or all Proposals, waive any irregularities, and/or accept the Proposal deemed most advantageous to the City considering factors in addition to Proposal price. Each Proposal shall include all shipping, taxes or other related costs.
- C. All Proposals shall be submitted on the attached Proposal forms. All items indicated on the forms shall be included and failure to include all items indicated will result in the rejection of the respective Proposals. Provide complete technical data on the equipment proposed including dimensions, materials, capacities, etc. Supplementary data or exceptions may be attached but shall not be submitted in lieu of any and all of the items required herein.
- D. In addition to the cost, the delivery schedule or availability shall be a fundamental parameter in the selection of the successful Respondent. The Respondent shall acknowledge in his Proposal that delivery shall be made within the specified time frame after receipt of the City's Notice of Award of Contract or purchase order. Delivery date will be a factor in the selection of the successful Respondent.

1.4 ADDENDA AND INTERPRETATIONS

- A. The City or the Engineer has the sole authority to issue any clarifications or changes to the RFP. No interpretations, exceptions, or supplementary information shall be binding upon the City, Respondent, or Engineer unless such interpretation, exception, or information is provided in writing to all Respondents in the form of a written addendum to this RFP.
- B. Should a Respondent find discrepancies in, or omissions from the specifications, or should be in doubt as to their meaning, he shall at once notify the City, who will send written instructions to all Respondents of record. The City and/or Engineer will NOT be responsible for oral instruction.

1.5 SITE INSPECTION/PRE-PROPOSAL CONFERENCE

- A. A pre-proposal conference and site visit will not be provided for this Proposal.

1.6 PROPOSAL EVALUATION

- A. The City of St. Louis Board of Public Service (City) and Ross & Baruzzini, Inc. (A/E) will evaluate the Proposals.
- B. The lowest purchase cost will be the primary factor in evaluation of Proposals; however, other criteria which will also be important to the evaluation include the following:
 - 1. Air Handling Unit overall size as it relates to fitting within the space.
 - 2. Adherence to Specification Section 15725P and supporting sections provided.
 - 3. Schedule.
 - 4. Orientation and location of piping and duct connections to air handling units to understand impact on installation requirements as designed.
- C. Award: The right is reserved, as the interest of the City may require, to reject any or all Proposals and to waive any minor informality or irregularity in Proposals received. The contract shall be awarded to that responsible Respondent whose Proposal, conforming to the Request for Proposals, will be most advantageous to the City, price and other factors considered.

1.7 PAYMENT

- A. The City of St. Louis will make a partial payment of 10% of the accepted Proposal upon approval of shop drawings for the specified equipment. Eighty five percent (85%) of the funds will be paid within one month of delivery of the air handling units specified. The remainder will be paid upon completion of start up services.
- B. Seller's Invoices: Invoices shall be prepared and submitted in triplicate unless otherwise specified. Invoices shall contain the following information.
 - 1. Contract number (if any).
 - 2. Purchase Order number.
 - 3. Item number.
 - 4. Contract description of supplies or services.
 - 5. Quantities, unit prices and extended totals.

1.8 PERFORMANCE BOND

- A. The air handling units and related equipment specified shall be delivered not before November 28, 2011, but not later than December 2, 2011. To guarantee delivery and because a partial payment has been made, the supplier shall provide a performance bond to the City. The value of the performance bond shall be 125% of the accepted Proposal amount. Said bond must be executed by a surety company satisfactory to the City of St. Louis and duly authorized to transact business in Missouri as evidenced by a Certificate of Authority granted by the Director, Department of Insurance for the state of Missouri. The surety company must have a policy Holders rating of "A-" or better and a Financial Rating of "VII" or higher as indicated in the latest edition of *Best's Key Rating Guide*. The surety must also have a Rating Outlook of "Stable" or better.

1.9 ADDITIONAL TERMS

- A. This Contract includes procurement of packaged, factory-fabricated and -assembled, modular air-handling units and specified accessories; as further specified in Section 15725P and other referenced sections attached herewith.
- B. This Contract also includes procurement of seismic roof curbs for rooftop air-handling units; as further specified in Section 15071P attached herewith.
- C. The Owner will contract separately for the installation of the equipment furnished herein.
- D. Equipment manufacturer's field services related to the installation work shall be included; as further specified in Sections 15725P and 15071P attached herewith.
- E. Customary and complete engineering submittals, shop drawings, field service reports, and Installation, Operation, and Maintenance manuals are required as part of this Contract; as further specified in Sections 15725P and 15071P attached herewith.
- F. Manufacturer's written warranty shall be as stated in 15725P attached herewith.
- G. Refer to Section 15725P attached herewith for terms and conditions related to Delivery, Unloading, Storage, Handling, and Insurance.
- H. The air handling units specified must be delivered to the job site not before November 28, 2011, but not later than December 2, 2011. This date is based on the construction schedule of the project in which they are to be installed. Respondent shall note that the release date for air handling units shall not occur until all shop drawings and related submittal items are approved by the Engineer and it is incumbent upon the Respondent to provide all submittal documents for Engineer's review in a timely manner. Respondent shall allow two weeks for Engineer's review. The City reserves the right to reject any Proposal that indicates delivery dates later than those detailed above.
- I. EQUIPMENT DETAIL
 1. Submit, with the Proposal but on separate sheets of paper, the required data as follows.
 2. The description of the unit shall include Make (Manufacturer), Model (series and size), voltage rating and other electrical data, a dimensional drawing, performance data, operating characteristics, furnished specialties and accessories; for all products Proposed.

SECTION 15055P - MOTORS - PROCUREMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes basic requirements for factory-installed motors associated with packaged air handling units.
- B. Section includes general requirements for polyphase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on ac power systems up to 600 V and installed at equipment manufacturer's factory.

1.2 DEFINITIONS

- A. **Factory-Installed Motor:** A motor installed by motorized-equipment manufacturer as a component of equipment.

1.3 COORDINATION

- A. Coordinate features of motors, installed units, and accessory devices and features that comply with the following:
 - 1. Compatible with magnetic controllers, multi-speed controllers, and/or reduced-voltage controllers where applicable.
 - 2. Designed and labeled for use with variable frequency controllers where applicable and suitable for use throughout speed range without overheating.
 - 3. Matched to torque and horsepower requirements of the load.
 - 4. Matched to ratings and characteristics of supply circuit and required control sequence.
- B. Coordinate motor support with requirements for driven load; access for maintenance and motor replacement; installation of accessories, belts, belt guards; and adjustment of sliding rails for belt tensioning.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide motors by one of the following:
 - 1. Baldor Electric Co.
 - 2. Century Electric Co.
 - 3. General Electric Co.
 - 4. MagneTek
 - 5. Marathon Electric Mfg. Co.
 - 6. Reliance Electric Co.
 - 7. Siemens Energy & Automation, Inc.

2.2 BASIC MOTOR REQUIREMENTS

- A. Basic requirements apply to mechanical equipment motors, unless otherwise indicated.

- B. Motors 1/2 HP and Larger: Polyphase.
- C. Frequency Rating: 60 Hz.
- D. Voltage Rating: NEMA standard voltage selected to operate on nominal voltage of circuit to which motor is connected.
- E. Service Factor: According to NEMA MG 1, unless otherwise indicated, but at least 1.15 for polyphase motors.
- F. Duty: Continuous duty at ambient temperature of 104°F and at altitude of 3300 ft above sea level.
- G. Capacity and Torque Characteristics: Rated for continuous duty and sufficient to start, accelerate, and operate connected loads at designated speeds, in indicated environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.
- H. Enclosure: Open dripproof, unless otherwise indicated.

2.3 POLYPHASE MOTORS

- A. Description: NEMA MG 1, medium induction motor.
- B. Design Characteristics: NEMA MG 1, Design E, unless otherwise indicated.
- C. Energy-Efficient Design: Premium efficiency motors as defined in NEMA MG 1; Part 31. In addition, motors shall meet efficiency levels defined in Tables 12-12 and 12-13 of MG 1-2006.
- D. Stator: Copper windings, unless otherwise indicated.
- E. Rotor: Random-wound, squirrel cage, unless otherwise indicated.
- F. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.
- G. Temperature Rise: Match insulation rating, unless otherwise indicated.
- H. Insulation: Class F, unless otherwise indicated.
- I. Code Letter Designation:
 - 1. Motors 15 HP and larger: NEMA starting Code F or Code G.
 - 2. Motors under 15 HP: Manufacturer's standard starting characteristics.
- J. Enclosure: Cast iron for motors 7.5 HP and larger; rolled steel for motors smaller than 7.5 HP; with enamel finish.
- K. Motor efficiencies for motors one horsepower and greater shall be as indicated in the table below for high-efficiency motors. Motors shall be tested and labeled in accordance with NEMA MG 1-2006 Part 12 Table 12-12 Standard. Motor nameplate labeling shall include both the minimum and nominal efficiency.

- L. **Required Motor Performance:** Efficiencies indicated below are required for 1800-rpm (4-pole) open motors.

HP	Minimum Power Factor	Nominal Efficiency	Minimum Efficiency
1	84%	85.5%	82.5%
1½	84%	86.5%	84.0%
2	84%	86.5%	84.0%
3	85%	89.5%	87.5%
5	85%	89.5%	87.5%
7½	85%	91.0%	89.5%
10	85%	91.7%	90.2%
15	85%	93.0%	91.7%
20	85%	93.0%	91.7%
25	85%	93.6%	92.4%
30	85%	94.1%	93.0%
40	85%	94.1%	93.0%
50	85%	94.5%	93.6%
60	85%	95.0%	94.1%
75	85%	95.0%	94.1%

- M. **Motors Used with Variable Frequency Controllers:** Ratings, characteristics, and features coordinated with and approved by controller manufacturer.

1. Designed with critical vibration frequencies outside operating range of controller output.
2. Temperature Rise: Matched to rating for Class B insulation.
3. Insulation: Class F or H.
4. Motor shall be inverter-duty or inverter-ready and shall not require the use of external cooling fans.

- N. **Source Quality Control:** Perform the following routine tests according to NEMA MG 1:

1. Measurement of winding resistance.
2. No-load readings of current and speed at rated voltage and frequency.
3. Locked rotor current at rated frequency.
4. High-potential test.
5. Alignment.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Use adjustable motor mounting bases for belt-driven motors.
- B. Align motors, bases, shafts, pulleys, and belts. Tension belts according to manufacturer's written instructions.
- C. Verify bearing lubrication.

- D. Run each motor with its controller. Demonstrate correct rotation, alignment, and speed at motor design load.
- E. Test interlocks and control and safety features for proper operation.
- F. Verify that current and voltage for each phase comply with nameplate rating and NEMA MG 1 tolerances.
- G. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

END OF SECTION 15055P

SECTION 15071P – MECHANICAL VIBRATION ISOLATION - PROCUREMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the procurement of seismic roof curbs associated with outdoor packaged modular air-handling units.

1.2 QUALITY ASSURANCE

- A. Single-Source: All vibration isolation devices shall be the product of a single manufacturer.

1.3 SUBMITTALS

- A. Submit the following directly to the Owner for approval.

1. Product Data: types, styles, materials, and finishes for each type of isolator specified. Include load deflection curves for each vibration isolation device.
2. Shop Drawings: Signed and sealed by a qualified professional engineer who is legally qualified to practice in the jurisdiction where the Project is located and who is experienced in providing engineering services of the kind indicated. Include the following:
 - a. Design Calculations: Calculate requirements for selecting vibration isolators and for designing vibration isolation bases.
3. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, base weights, equipment static loads, power transmission, component misalignment, and cantilever loads.
4. Manufacturer Seismic Qualification Certification: Submit certification that all specified equipment will withstand seismic forces.

1.4 COORDINATION

- A. Coordinate layout and installation of vibration isolation devices with other construction that is supported by them.

PART 2 - PRODUCTS

2.1 GENERAL

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

1. Amber/Booth Company, Inc.
2. B-Line Systems, Inc.
3. Isolation Technology, Inc.
4. Kinetics Noise Control, Inc.
5. Mason Industries, Inc.
6. Vibration Eliminator Co., Inc.

7. Vibration Isolation Co., Inc.
8. Vibration Mountings & Controls/Korfund.

- B. Model numbers by Mason Industries, Inc. are listed below to establish the level of quality required.
- C. All neoprene referred to hereinafter shall be oil resistant, compounded for not greater than 65 durometer, minimum tensile strength of 2000 psi, minimum elongation of 300%, and maximum compression set at 25% of the original deflection.
- D. Where exposed to the atmosphere, all steel shall be hot dipped galvanized unless noted otherwise.
- E. All hardware shall be cadmium plated.
- F. All springs shall be neoprene coated.

2.2 VIBRATION ISOLATORS

- A. Spring Isolators (Schedule Designation Type 3): Freestanding, laterally stable, open-spring-type isolators. Design and install such that ends of springs remain parallel. Model SLF by Mason Industries, Inc.
 1. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 2. Minimum Additional Travel: 50 percent of the required deflection at rated load.
 3. Lateral Stiffness: More than 1.2 times the rated vertical stiffness.
 4. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
 5. Baseplates: Factory drilled for bolting to structure and bonded to ½-inch- (13-mm-) thick, rubber isolator pad attached to baseplate underside. Baseplates shall limit floor load to 100 psig (690 kPa).
 6. Top Plate and Adjustment Bolt: Threaded top plate with adjustment bolt and cap screw to fasten and level equipment.

2.3 RESTRAINED VIBRATION ISOLATION SEISMIC ROOF-CURB RAILS

- A. Description (Schedule Designation Type D): Factory-assembled, fully enclosed, insulated, air- and watertight curb rail designed to resiliently support equipment and to withstand 125-mph (56-m/s) wind impinging laterally against side of equipment. Model SRSC by Mason Industries, Inc.
- B. Lower Support Assembly: Sheet-metal "Z" section containing adjustable and removable steel springs that support upper floating frame. Upper frame shall provide continuous support for equipment and shall be captive to resiliently resist wind and seismic forces. Lower support assembly shall have a means for attaching to building structure and a wood nailer for attaching roof materials, and shall be insulated with a minimum of 2 inches (50 mm) of rigid, glass-fiber insulation on inside of assembly.
- C. Elastomeric Isolator Pads: Schedule Designation Type 1 as specified above.

- D. **Restrained Spring Isolators:** Schedule Designation Type 4 as specified above, plus shall have access ports, for level adjustment, with removable waterproof covers at all isolator locations. Isolators shall be located so they are accessible for adjustment at any time during the life of the installation without interfering with the integrity of the roof.
- E. **Snubber Bushings:** All-directional, elastomeric snubber bushings at least ¼-inch (6 mm) thick.
- F. **Water Seal:** Galvanized sheet metal with EPDM seals at corners, attached to upper support frame, extending down past wood nailer of lower support assembly, and counterflashed over roof materials.
- G. **Accessories:** Provide the following accessories where scheduled, noted, or otherwise indicated on Drawings:
 - 1. **Integrated Pitch Corrections:** Where shimming cannot compensate for unusual roof deck pitch, provide Integrated Pitch Corrections. Provide a level isolation curb with lower members that follow the pitch in the roof.
 - 2. **Access and Duct Openings:** Framed horizontal openings with angle iron and cover plates.
 - 3. **Acoustical Package:** The floating member of the roof curb shall have a perimeter angle cross members to support two layers of 5/8" waterproof gypsum board laid on with staggered joints. Gypsum board must surround ducts to provide a continuous sound break. This acoustical barrier shall be caulked to minimize sound transmission. Where the mechanical arrangement makes attachment to the floating member unfeasible, the barrier shall be attached at the highest practical elevation of the fixed curb with provision for 1" thick closed cell neoprene flexible seals around the ductwork. A four-inch layer of 1.5 density fiberglass shall cover the entire solid roof surface under the unit. Ductwork shall be lined with sound absorbent material coated with a dampening compound such as Mason Industries MDC-10. Complete instructions shall be provided by the spring isolation curb manufacturer. Mason Industries, Inc. Model RSC-dB.

2.4 FACTORY FINISHES

- A. **Manufacturer's standard prime-coat finish ready for finish painting.**
- B. **Finish:** Manufacturer's standard paint applied to factory-assembled and -tested equipment before shipping.
 - 1. Powder coating on springs and housings.
 - 2. All hardware shall be electrogalvanized. Hot-dip galvanized metal components for exterior use.
 - 3. Baked enamel for metal components on isolators for interior use.
 - 4. Color-code or otherwise mark vibration isolation and seismic-control devices to indicate capacity range.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The seismic roof curb will be installed under a subsequent construction contract at the building site. The Owner will contract separately for the installation of the equipment furnished herein at the jobsite.

- B. The seismic roof curb manufacturer's obligations for field services related to the installation work, as described below, shall be included as the work of this Procurement Contract. Coordination with the installing contractor by the equipment manufacturers is required for field services indicated herein. The installing contractor assumes responsibility for all coordination with equipment manufacturer's at time they take possession of procured equipment for installation relieving Owner of this responsibility.

3.2 DEMONSTRATION

- A. Provide the services of a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain air-mounting systems.

END OF SECTION 15071P

SECTION 15725P – MODULAR PACKAGED AIR-HANDLING UNITS - PROCUREMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes procurement of modular packaged air-handling units with coils for indoor or outdoor installations as further described herein. Refer to attached sketch drawings for equipment schedules and plans indicating equipment installation conditions.
- B. The Owner will contract separately for the installation of the equipment furnished herein.
- C. Equipment manufacturer's field services related to the installation work shall be included as further described herein.
- D. Related Sections include the following:
 - 1. Section 15055P "Motors."
 - 2. Section 15820P "Duct Accessories" for dampers used as an integral part of factory-packaged air-handling units specified in this Section.
 - 3. Section 15861 "Air Filters" for filters used as an integral part of factory-packaged air-handling units specified in this Section.
 - 4. Section 16269P "Variable Frequency Drives" for motor controllers utilized to vary the speed of the fan motors in response to a temperature control signal.

1.2 SUBMITTALS

- A. Submit the following directly to the Owner for approval prior to release to production:
 - 1. Product Data: For each type of modular packaged air-handling unit indicated. Include the following:
 - a. Certified fan-performance curves with system operating conditions indicated.
 - b. Certified fan-sound power ratings.
 - c. Certified coil-performance ratings with system operating conditions indicated.
 - d. Motor ratings, electrical characteristics, and motor and fan accessories.
 - e. Material gages and finishes.
 - f. Filters with performance characteristics.
 - g. Dampers, including housings, linkages, and operators.
 - h. Product data for all specified accessories.
 - 2. Shop Drawings: From manufacturer detailing equipment assemblies and indicating dimensions, weights, loadings, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Wiring Diagrams: Power, signal, and control wiring. Differentiate between manufacturer-installed and field-installed wiring.
 - 4. Warranty: Special warranty specified in this Section.

B. Manufacturer Seismic Qualification Certification: Submit certification that modular packaged air-handling units, accessories, and components will withstand seismic forces defined below. Include the following:

1. **Basis for Certification:** Indicate whether withstand certification is based on actual test of assembled components or on calculation. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."
2. **Dimensioned Outline Drawings of Equipment Unit:** Identify center of gravity and locate and describe mounting and anchorage provisions.
3. **Detailed description of equipment anchorage devices** on which the certification is based and their installation requirements.
4. **Seismic Forces:** 128% of the equipment's operating weight, applied horizontally at the center of gravity, independently longitudinally and laterally in combination with service loads associated with the component; plus a concurrent vertical force of 11% of the equipment's operating weight, applied at the center of gravity of the component, in either vertical direction.

C. Submit the following to the installing contractor (whom will be identified to Respondent when that determination is made):

1. Source quality-control test reports; for all products furnished.
2. Field quality-control reports; for all products furnished.
3. **Operation and Maintenance Data:** For air handling units, components, and accessories to include in emergency, operation, and maintenance manuals.
4. Startup service reports.

1.3 QUALITY ASSURANCE

- A. **Source Limitations:** Obtain modular packaged air-handling units through one source from a single manufacturer.
- B. **Product Options:** Drawings indicate size, profiles, and dimensional requirements of factory-packaged air-handling units and are based on the specific system and model indicated.
- C. **NFPA Compliance:** Factory-packaged air-handling units and components shall be designed, fabricated, and installed in compliance with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."
- D. **ARI Certification:** Factory-packaged air-handling units and their components shall be factory-tested according to the applicable portions of ARI 430 and shall be listed and bear the label of the Air-Conditioning and Refrigeration Institute (ARI).
- E. **Fan Performance Ratings:** Rate according to AMCA 210, "Laboratory Methods of Testing Fans for Rating." In addition, all airfoil fans shall comply with AMCA standard 99-2408-69 and 99-2401-82 and shall bear the AMCA Seal.
- F. **Sound Power Level Ratings:** Rate according to AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data" and AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Fans shall bear AMCA-certified sound ratings seal.

- G. **Sound Power Level Ratings:** Rate according to ARI 260-2001, "Sound Rating of Ducted Air Moving and Conditioning Equipment."
- H. **Air Coils:** Certify capacities, pressure drops, and selection procedures in accordance with ARI 410.
- I. **UL and NEMA Compliance:** Provide motors required as part of air-handling units that are listed and labeled by UL and comply with applicable NEMA standards.
- J. **Comply with NFPA 70 for components and installation.**
- K. **Listing and Labeling:** Provide electrically operated components specified in this Section that are listed and labeled.
 - 1. **The Terms "Listed" and "Labeled":** As defined in the National Electrical Code, Article 100.

1.4 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver air-handling unit as a factory-assembled module with shipping splits only as necessary to meet the dimensional restrictions identified on the sketch drawings, and with protective crating and covering.
- B. Lift and support units with manufacturer's designated lifting or supporting points.

1.5 EXTRA MATERIALS

- A. Furnish the extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. **Filters:** Furnish additional sets as specified in Section 15861P "Air Filters."
 - 2. **Fan Belts:** Furnish one (1) additional complete set for each modular packaged air-handling unit fan.
 - 3. **Gaskets:** Furnish one (1) additional complete set for each access door.
 - 4. **Additional Pulleys/Sheaves:** Furnish one (1) additional motor and fan pulley/sheave set for each fan, to be sized during field startup and testing phase, as needed for fan operation at design point.
 - a. **Exception:** Extra pulley/sheave is not required for fans whose speed is controlled by a variable frequency drive, provided that specified performance can be met with speed controller at or below 100% output.
 - b. **Exception:** Extra pulley/sheave is not required where primary pulley/sheave is adjustable in pitch.

1.6 WARRANTY

- A. **Special Warranty:** Manufacturer's standard form in which manufacturer agrees to repair or replace select components of air handling units that fail in materials or workmanship within specified warranty period.

1. **Warranty Period for Entire Package:** 2 years from date of Substantial Completion associated with installation of equipment by installing contractor. Includes entire air handling unit assembly and all associated components

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
 1. Carrier Corporation, a United Technologies Company.
 2. CES Group Inc.; Governair, Mammoth, Temtrol, Venmar Ventrol, Webco Divisions.
 3. Engineered Air.
 4. McQuay International, division of Daikin Industries, Ltd.
 5. Trane Inc., division of Ingersoll-Rand Company.
 6. York, division of Johnson Controls, Inc.

2.2 MANUFACTURED UNITS

- A. **General Description:** Factory-assembled, 2-inch solid double-wall units consisting of fans, motor and drive assembly, coils, dampers, plenums, filters, and condensate pans. Configuration of units is detailed on the Drawings.
- B. **Pressure Class:** Meet requirements of this Specification at all of the following water column static pressure conditions:
 1. **Exterior Cabinet Wall:** 6-inch positive and 4-inch negative water column static pressure differential across casing of the air-handling unit; or the largest static pressure capability of the unit fan(s) at any point on their operating curve; whichever is greater.
 2. **Internal Cabinet Walls between the Economizer and Mixing Box Sections:** 10-inch static pressure differential (i.e., 4-inch positive and 6-inch negative) water column across this internal compartment wall of the air-handling unit; or the largest static pressure capability of the unit's supply and return fans at any point on their operating curves; whichever is greater.
 3. **Structural Performance:** Casing panels shall be self-supporting and capable of withstanding static pressures indicated above, without panel joints exceeding a deflection of L/200 where "L" is the unsupported span length within completed casings.

2.3 CABINET

- A. **Materials:** Formed and reinforced G-90 mill galvanized steel wall and top panels, fabricated to allow removal for access to internal parts and components without affecting the structural integrity of the unit, with joints between sections sealed.
 1. **Outer Casing:** Galvanized steel, 16-gage; 18-gage permitted in unit nominal cross-section sizes 40 sf and smaller.
 - a. **Factory finish paint** the entire outer casing. Finish shall pass a 672-hour salt spray test based on ASTM B117.

2. Inner Casing: Galvanized steel, 20 gage solid in all sections.
 3. Option: 22-gage external/internal casing thickness will be acceptable in lieu of the above requirements if applied as part of an engineered panel construction using closed-cell insulation, and if the assembly meets pressure and rigidity requirements specified elsewhere in this section.
 4. Floor Plate: Galvanized steel, 18 gage solid.
- B. Base Rail, Indoor Units: The entire unit shall be supported on a 14 gage galvanized steel rail channel or rustproof-painted structural steel rail. Minimum rail height shall be 6". Provide integral lifting lugs.
- C. Base Rail, Outdoor Units: The entire unit shall be supported on a 14 gage galvanized steel rail channel or rustproof-painted structural steel rail, designed with a continuous recessed curb mounting surface for field application of a gasket between curb and unit. Minimum rail height shall be 4". Provide integral lifting lugs.
- D. Roof, Outdoor Units: Pitched at $\frac{1}{4}$ " per foot, minimum, with no low spots that could puddle water. Roof edges shall overhand the side panels by at least 2". Roof and sidewall seams shall be continuously caulked and covered with seam caps.
- E. Insulation: Glass-fiber insulation, complying with ASTM C 1071 and NFPA 90A.
1. Thermal Performance: k-value 0.26 BTU-in/(hr-sf-degF) at 75°F mean temperature.
 2. Thickness: 2 inches (50 mm), 3-pound density.
 3. Option: Closed-cell insulation of at least 2-pound density and R-12 thermal performance will also be acceptable.
 4. Fire-Hazard Classification: Maximum flame-spread index of 25 and smoke-developed index of 50, when tested according to ASTM C 411.
 5. Location and Application: Encased between outside and inside casing.
- F. Access Doors: Same materials and finishes as cabinet and complete with hinges, latches, handles, and gaskets. All doors shall have direction of swing chosen to provide a seating head pressure against the door gasket.
1. The following locations, and other unit sections as indicated on Drawings, shall have access doors sized and located to allow periodic maintenance and inspections. Access doors shall be on the same side of the unit as the coil connections unless indicated otherwise.
 - a. Fan Section, motor side.
 - b. Access Section.
 - c. Damper Section.
 - d. Filter Section.
 2. Latches: Minimum of two (2) heavy-duty industrial-type per door.
 3. Not Acceptable: Access panels which do not remain attached to the unit when opened.
- G. Drain Pans: Readily cleanable, formed sections of stainless steel sheet complying with ASHRAE Standard 62. Fabricate pans in sizes and shapes to collect condensate from cooling coils (including coil piping connections and return bends) when units are operating at maximum

catalogued face velocity across cooling coil. Pans shall be sloped in two planes for complete drainage to a single outlet without standing water.

1. **Double-Wall Construction:** Fill space between walls with 2" insulation and seal moisture tight.
2. **Drain Connection:** Same side of unit as coil connection side, unless noted otherwise; pre-piped to exterior of unit.
3. Units with stacked coils shall have an intermediate drain pan or drain trough to collect condensate from top coil.
4. All portions of the drain pan, including intermediate pans and any hardware subject to contact with condensate, shall be constructed of Type 304 stainless steel.
5. **Fasteners:** All fasteners exposed to weather shall be corrosion-resistant.

2.4 FAN SECTION

- A. **Fan-Section Construction:** Fans consisting of housing, wheel, fan shaft, bearings, motor, drive assembly, and support structure and equipped with formed-steel channel base for integral mounting of fan, motor, and casing panels. Mount fan scroll, wheel, shaft, bearings, and motor on structural-steel frame, with frame mounted on base with vibration isolation.
 1. Install fans on housed spring vibration isolators, minimum 2-inch (50-mm) static deflection, with seismic snubbers. Vibration isolators shall be Mason Industries Model SLF or equal.
 2. Install duct flexible connector at point of connection of fan discharge to the unit cabinet.
- B. **Fans, General:** All fans shall be housed, double-width, double-inlet type with airfoil blades; unless another type of fan is expressly indicated on Drawings or elsewhere in these Specifications.
- C. **Centrifugal Fan Housings:** Formed- and reinforced-steel panels to make curved scroll housings with shaped cutoff, spun-metal inlet bell, and access doors or panels to allow entry to internal parts and components.
 1. **Panel Bracing:** Steel angle- or channel-iron member supports for mounting and supporting fan scroll, wheel, motor, and accessories.
 2. **Performance Class:** AMCA 99-2408, Class I, II or III as scheduled; Class I if not otherwise indicated. If the fan selection indicates an operating point within 10 percent of the maximum operational rpm limit for the fan class indicated by the selection point, the fan manufacturer shall provide a fan of the next-higher class designation.
 3. **Horizontal Flanged Split Housing:** Bolted construction.
 4. **Plug Fans:** With steel cabinet. Fabricate without fan scroll and volute housing.
- D. **Fan Assemblies:** Statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and motor horsepower.
- E. **Airfoil-Fan Wheels:** Required unless otherwise indicated. Steel construction with smooth-curved inlet flange, heavy backplate, and hollow die-formed airfoil-shaped blades continuously welded at tip flange and backplate; cast-iron or cast-steel hub riveted to backplate and fastened to shaft with set screws.

- F. Plenum "Plug" Fans:** Permitted only where expressly indicated on Drawings or elsewhere in these Specifications. Steel construction with smooth-curved inlet flange, heavy backplate, and hollow die-formed airfoil-shaped blades continuously welded at tip flange and backplate; cast-iron or cast-steel hub riveted to backplate and fastened to shaft with set screws. Fabricate without fan scroll and volute housing. Single-width, single-inlet style.
- G. Shafts:** Statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and motor horsepower, with final alignment and belt adjustment made after installation.
1. Turned, ground, and polished hot-rolled steel with keyway. Ship with a protective coating of lubricating oil.
 2. Designed to operate at no more than 70 percent of first critical speed at top of fan's speed range.
- H. Grease-Lubricated Shaft Bearings:** Self-aligning, pillow-block-type, ball or roller bearings with adapter mount and two-piece, cast-iron housing; rated for duty at maximum fan speed.
1. Tapered roller bearings with double-locking collars meeting the above requirements will be acceptable.
 2. Pre-lubricated and sealed-type ball bearings meeting the above requirements will also be acceptable.
 3. Bearing Rating Life: ABMA 9, L_{10} of 40,000 hours.
 4. Bearing lubrication lines and grease fittings shall be extended to, and mounted adjacent to, unit access door(s) for easy accessibility.
- I. Belt Drives:** Factory mounted, with final alignment and belt adjustment made after installation and with 1.5 service factor based on fan motor.
1. Pulleys: Cast iron or cast steel with split, tapered bushing; dynamically balanced at factory.
 2. Motor Pulleys: Adjustable pitch for use with 5-hp motors and smaller; fixed pitch for use with motors larger than 5 hp. Select pulley so pitch adjustment is at the middle of adjustment range at fan design conditions.
 3. Belts: Oil resistant, nonsparking, and nonstatic; matched for multiple belt drives.
 4. Motor Mount: Adjustable for belt tensioning.
- J. Fan-Section Source Quality Control:**
1. Sound Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Fans shall bear AMCA-certified sound ratings seal.
 2. Sound Power Level Ratings: Comply with ARI 260-2001, "Sound Rating of Ducted Air Moving and Conditioning Equipment." Test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans."
 3. Factory test fan performance for flow rate, pressure, power, air density, rotation speed, and efficiency. Establish ratings according to AMCA 210, "Laboratory Methods of Testing Fans for Rating."

2.5 MOTORS

- A. **General:** Refer to Section 15055P "Motors" for general requirements, which are fully applicable to the work of this Section as if repeated herein.
- B. **Motor Sizes:** Minimum size as indicated, but larger if necessary so driven load will not require motor to operate in service factor range at design point, and larger if necessary so driven load will not require motor to operate beyond the service factor at any point on the fan curve.
- C. **Location:** Motor, drive, and access door shall be on the same side of the fan as the coil connection side, unless otherwise indicated. Provide motor on an adjustable base, inside the air handling unit housing. Motors external to the air-handling unit housing are not acceptable.
- D. **Inverter-Duty or Inverter-Ready Motors** are required for all fans indicated to be controlled by a variable frequency drive.
- E. **Noise Rating:** Quiet.
- F. **Starters, Electrical Devices, and Wiring:** Electrical devices and connections are specified in Division 16 Sections.

2.6 HYDRONIC COILS

- A. **Coil Sections:** Individual, insulated casings for each heating coil and cooling coil separately. Design and construct to facilitate removal and replacement of coil for maintenance and to assure full airflow through coils.
- B. **Coil Casing:** Same as cabinet construction for heating coil sections; same as cabinet construction but with all stainless steel materials for cooling coil sections.
- C. **Circuit Arrangement:** Self-draining and self-venting coil fabricated according to ARI 410. Number of rows shall be determined by manufacturer to meet scheduled performance requirements. Unless noted otherwise, do not exceed 2 rows for heating coils nor 8 rows for cooling coils.
- D. **Piping Connections:** Threaded or grooved, on same side. Coil connections shall be on the side of the unit indicated on the Drawings.
- E. **Tubes:** Copper, 1/2" O.D. with 0.016" minimum wall; or 5/8" O.D. with 0.020" minimum wall. Select coils for not less than 1 fps water velocity and not more than 6 fps water velocity.
- F. **Fins:** Aluminum of minimum thickness 0.006". Spacing shall not exceed 10 per inch for heating coils nor 12 per inch for cooling coils.
- G. **Fin and Tube Joint:** Mechanical bond created via thermal expansion.
- H. **Headers:** Non-ferrous, such as seamless copper tube with brazed joints, with drain and air vent tappings. Headers and return bends shall be enclosed within the air handling unit casing.
- I. **Frames:** Stainless steel, 0.0625 inch (1.58 mm) is required for cooling coils. Galvanized-steel channel frame, 0.052 inch (1.3 mm) is acceptable for heating coils.

- J. Ratings: Design tested and rated according to ASHRAE 33 and ARI 410.
- K. Working-Pressure Ratings: 200 psig (1380 kPa), 325°F (163 C).
- L. Source Quality Control: Test to 300 psig (2070 kPa) and to 200 psig (1380 kPa) underwater.

2.7 DAMPER SECTION

- A. Damper Section (AHU-27 and AHU-32): Furnish and factory-install return air dampers and relief air dampers in an economizer arrangement within air handling.
- B. Damper Section (AHU-33 and AHU-34): Furnish and factory-install outdoor air dampers, return air dampers, and relief air dampers in an economizer arrangement within air handling. Outside air damper shall be comprised of two (2) independent dampers – minimum outside air damper and economizer damper.
- C. Refer to Section 15820P "Duct Accessories" for specification of automatic control dampers, whose requirements govern as if fully reproduced herein.
 - 1. It is the intent of this specification that damper actuators will be furnished and field-installed by the installing contractor as part of an overall building temperature control system.

2.8 FILTER SECTION

- A. Air Filters: Refer to Section 15861P "Air Filters" which is fully applicable to this Section as if repeated herein.
- B. Filter Section: Provide filter media holding frames arranged for angle vertical orientation, with access doors on both sides of unit, but capable of complete filter change from one side of the unit.

2.9 SILENCERS (AHU-33 & AHU-34 ONLY)

- A. General: Factory-fabricated and -tested, rectangular silencer with performance characteristics and physical requirements as indicated. Refer to schedule on Drawings. Duct silencers may be referred to as "Sound Attenuators" on the Drawings.
- B. Fire Performance: Adhesives, sealers, packing materials, and accessory materials shall have fire ratings not exceeding 25 for flame spread and 50 for smoke developed when tested according to ASTM E 84.
- C. Rectangular Units: Fabricate casings with a minimum of 22-gage solid sheet metal for outer casing and 26-gage perforated sheet metal for inner casing.
- D. Interior Partitions and Baffles: At least 22-gage and designed for minimum aerodynamic losses.
- E. Sheet Metal Perforations: 1/8-inch (3-mm) diameter for inner casing and baffle sheet metal.
- F. Fibrous Acoustic-Fill Material: Inert and vermin-proof fibrous material, packed under not less than 5 percent compression.

- G. Fabricate silencers to form rigid units that will not pulsate, vibrate, rattle, or otherwise react to system pressure variations.
1. Do not use nuts, bolts, and sheet metal screws for unit assemblies.
 2. Look form and seal or continuously weld joints.
 3. Reinforcement: Cross or trapeze angles for rigid suspension. Silencer shall withstand 8 inches w.g. pressure differential inside-to-outside without structural failure.
- H. Source Quality Control: Perform the following factory tests:
1. Acoustic Performance: Test according to ASTM E 477, with airflow in both directions through silencer.
 2. Record acoustic ratings, including dynamic insertion loss and self-noise power levels, for both forward flow (air and noise in same direction) and reverse flow (air and noise in opposite directions) with airflow of at least 2000-fpm (10-m/s) face velocity.
 3. Leak Test: Test units for air tightness at 200 percent of associated fan static pressure or 6-inch wg (1500-Pa) static pressure, whichever is greater.

2.10 AIR HANDLING UNIT ACCESSORIES

- A. Auxiliary Piping Cabinet, Outdoor Units: Air handling unit manufacturer shall provide a factory-assembled, weather-tight, insulated auxiliary piping cabinet exterior to, but immediately adjacent to, the main body of the air handling unit.
1. Dimensions: 48" depth; height matching air handling unit height; width as required to completely encompass all hydronic coil sections associated with any given air handling unit.
 2. Construction: Casing materials, walls, floor, roof, insulation, curb, base rail, and access doors shall meet the same specifications described above for the main air handling unit casing.
 3. Provide floor slightly pitched to one corner, with a small weephole for drainage to the exterior.
 4. Auxiliary piping cabinet shall be shipped loose for field installation by the installing contractor.
- B. View Windows: Each access door shall include a wired-glass window for viewing, capable of withstanding unit operating pressures specified.
1. Exception: Air handling units less than or equal to 30 square feet in nominal cross sectional area shall not require view windows.
- C. Marine Lights: Each section which includes an access door shall also include a factory-mounted, enclosed and gasketed, vapor-tight, incandescent light fixture. Include junction box, globe, aluminum globe guard, receptacle, and bulb ready for field wiring.
1. Exception: Air handling units less than or equal to 30 square feet in nominal cross sectional area shall not require marine lights.
- D. GFCI Receptacle, Outdoor Units: Provide duplex GFI receptacle; 20 amp / 120 volt, on the unit exterior. The exterior receptacle shall be weatherproof. Field wiring of the receptacle is the work of the Installing Contractor.

- E. **Roof Curb, Outdoor Units:** Refer to Section 15071P "Mechanical Vibration Controls" for vibration isolation roof curbs and equipment support rails.
- F. **Roof Curbs, Outdoor Units:** Factory-assembled, fully enclosed, insulated, air- and watertight curb rail designed to resiliently support equipment and to withstand 125-mph (56-m/s) wind impinging laterally against side of equipment. Galvanized steel; mitered and welded corners; 1½-inch- (40-mm-) thick, rigid, fiberglass insulation adhered to inside walls; and 1½-inch- (40-mm) wood nailer. Size as required to suit roof opening and unit base.
1. **Water Seal:** Galvanized sheet metal with EPDM seals at corners, attached to upper support frame, extending down past wood nailer of lower support assembly, and counterflashed over roof materials.
 2. **Configuration:** Built-in cant and mounting flange, with manufactured custom pitch, to take up roof pitch for level mounting surface.
 3. **Overall Height:** Minimum 12 inches (300 mm).
- G. **Inlet and Outlet Hoods, Outdoor Units:** Weatherproof hood and bird screen, with gravity backdraft damper for exhaust and spring-return, two-position, motor-operated damper with blade seals for supply.
- H. **Diffuser Section, Outdoor Units:** Provide diffuser section with a perforated diffuser plate to assure even distribution of airflow across the entire cooling coil face area. Diffuser section shall be installed immediately downstream of the supply fan.
- I. **Variable Frequency Drives, Outdoor Units:** Refer to Section 16269P "Variable Frequency Drives" which is fully applicable to this Section as if repeated herein.

PART 3 - EXECUTION

3.1 DELIVERY

- A. All materials shall be delivered to the project site in manufacturer's original containers with labels intact. Point of delivery shall be the Kitchen Loading Dock on Cole Street on the north side of the America's Center facility. The installing contractor will provide equipment and personnel for unloading to Owner's designated storage area in the Lower Level adjacent to Kitchen Loading Dock.
- B. Manufacturer's authorized representative shall witness unloading and transport to Owner's designated storage area, and shall witness uncrating. Verify all materials as undamaged at time of delivery to site. Replace any damaged items promptly at no additional cost of any kind to the Owner.
- C. Delivery and/or construction vehicles will not be permitted to remain in the delivery area after they are unloaded. Drivers of all vehicles must be in attendance at all times to move the vehicles when directed by the Owner's personnel. All new materials unloaded from vehicles must be delivered to project site immediately.
- D. **Insurance:** The manufacturer shall provide insurance against the loss or damage to the equipment, however caused, until the equipment is delivered and signed for at the project site by a representative authorized by the Owner. Thereafter, the Owner will provide insurance against the loss or damage to the equipment.

- E. Date of delivery shall be scheduled with 7-day advance notice to the Owner.

3.2 INSTALLATION

- A. The air handling unit and related equipment will be installed under a subsequent construction contract at the building site. The Owner will contract separately for the installation of the equipment furnished herein at the jobsite.
- B. The air handling unit manufacturer's obligations for field services related to the installation work, as described below, shall be included as the work of this Procurement Contract. Coordination with the installing contractor by the equipment manufacturers is required for field services indicated herein. The installing contractor assumes responsibility for all coordination with equipment manufacturer's at time they take possession of procured equipment for installation relieving Owner of this responsibility.

3.3 FIELD QUALITY CONTROL

- A. **Manufacturer's Field Service:** Provide the services of a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections.
- B. **Supervise and witness the following tests and inspections. Report results in writing.**
1. **Leak Test:** After installation, fill water coils with water and test coils and connections for leaks. Repair leaks and retest until no leaks exist.
 2. **Fan Operational Test:** After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Remove malfunctioning units, replace with new units, and retest.
 3. **Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.**
- C. **Occupancy Adjustments:** When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other than normal occupancy hours for this purpose.

3.4 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
- B. **Final Checks before Startup:** Witness and report results of checks completed by the Installing Contractor which includes the following:
1. Verify that shipping, blocking, and bracing are removed.
 2. Verify that unit is secure on mountings and supporting devices and that connections to piping, ducts, and electrical systems are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
 3. Perform cleaning and adjusting specified in this Section.
 4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify free fan wheel rotation and smooth bearing operations. Reconnect fan drive system, align belts, and install belt guards.

5. Lubricate bearings, pulleys, belts, and other moving parts with factory-recommended lubricants.
6. Set outside- and return-air mixing dampers to minimum outside-air setting.
7. Comb coil fins for parallel orientation.
8. Install clean filters.
9. Verify that manual and automatic volume control and fire dampers in connected duct systems are in fully open position.

C. Starting procedures for modular packaged air-handling units include the following:

1. Energize motor; verify proper operation of motor, drive system, and fan wheel.
2. Measure and record motor electrical values for voltage and amperage.
3. Manually operate dampers from fully closed to fully open position and record fan performance.

3.5 CLEANING

- A. Inspect and document to ensure the air handling unit has been thoroughly cleaned.

3.6 DEMONSTRATION

- A. Provide the services of a factory-authorized service representative to train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, and preventive maintenance.
1. Review data in the operation and maintenance manuals. Refer to Division 01 for requirements.
 2. Schedule training with Owner, through Architect, with at least 7 days' advance notice.
- B. In addition, provide DVD-format video training sessions. A minimum of eight hours shall be included in this procurement agreement for air handling units.

END OF SECTION 15725P

SECTION 15820P - DUCT ACCESSORIES - PROCUREMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the requirements for automatic control dampers provided as part of packaged modular air-handling units.

1.2 QUALITY ASSURANCE

- A. Comply with AMCA 500-D testing for damper rating.

PART 2 - PRODUCTS

2.1 AUTOMATIC CONTROL DAMPERS

- A. Low-leakage rating, with linkage outside airstream, and bearing AMCA's Certified Ratings Seal for both air performance and air leakage. Subject to compliance with requirements, an example of an acceptable product is Ruskin Model CD-60.
1. Leakage Rating: Maximum 3 cfm per square foot of damper area at 1 inch pressure when tested in accordance with AMCA Publication 500.
 2. Temperature Class: -40 to +200°F.
- B. Frames: Minimum 16 gage galvanized sheet steel frame formed into a structural hat channel reinforced at the corners; with mitered and welded corners.
- C. Blades: Airfoil-shaped or triple-v-groove blades of galvanized steel construction.
1. Multiple blade with maximum blade width of 6 inches (150 mm).
 2. Action: Parallel or opposed action as scheduled; opposed if not scheduled.
 3. Blade Edging: Closed-cell neoprene edging, mechanically locked into blade edge.
 4. Blade Thickness: 14- gage.
- D. Blade Axles: ½-inch- (13-mm-) diameter; galvanized steel; square or hex-shape mechanically locked to blade; and blade-linkage hardware of zinc-plated steel and brass; ends sealed against blade bearings.
- E. Bearings: Stainless-steel sleeve type, with thrust bearings at each end of every blade. Dampers shall have axles full length of damper blades and bearings at both ends of operating shaft.
- F. Jamb Seals: Flexible metal compressible.
- G. Damper Motors: Furnished and installed by the Installing Contractor.
- H. Minimum Outdoor Air Dampers (AHU-33 and AHU-34 only): In addition to the requirements specified herein, the minimum outdoor air damper shall feature an integral airflow measuring station. Airflow measuring station shall include integral flow straightener and built-in measuring ports accurate to within 5%. Airflow measuring station shall produce a 2-10 VDC

output signal when provided a 24 VDC power connection. Example of acceptable product is
Ruskin Model IAQ-50.

PART 3 - EXECUTION (Not Used)

END OF SECTION 15820P

SECTION 15861P - AIR FILTERS - PROCUREMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes factory-fabricated air-filter devices and media associated with packaged modular air-handling units.

1.2 SUBMITTALS

- A. Submit the following directly to the Owner for approval.
1. **Product Data:** For each type of product indicated. Include dimensions; operating characteristics; required clearances and access; rated flow capacity, including initial and final pressure drop at rated airflow; efficiency and test method; fire classification; furnished specialties; and accessories for each model indicated. Submit documentation indicating that units comply with ASHRAE 62.1, Section 5 - "Systems and Equipment."
- B. Submit the following to the installing contractor (whom will be identified to Respondent when that determination is made):
1. **Operation and Maintenance Data:** For each type of filter and rack to include in emergency, operation, and maintenance manuals.

1.3 QUALITY ASSURANCE

- A. Comply with NFPA 90A.
- B. **ASHRAE Compliance:** Comply with provisions of ASHRAE 52.2-2007 for method of testing and rating air-filter units. The term "MERV" as used herein is defined by ASHRAE Standard 52.2-2007 *Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size*.
- C. **ASHRAE Compliance for Finish of Interior Surfaces:** Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2007.
- D. Comply with ARI 850.

1.4 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Provide two complete sets of filters for each filter bank, in addition to the initial set. The initial set shall be used to protect the ductwork and equipment during construction. The second set shall be installed by the Contractor upon Final Completion of the project. The third set shall be turned over to the Owner for use as spares.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. **Air Filters:** Subject to compliance with requirements, provide particulate air filters by one of the following:
1. AAF International
 2. Airguard Industries, Inc.
 3. Barnebey - Sutcliffe Corp.
 4. Farr Co.
 5. Koch Filter Corp.
- B. **Filter Gages:** Subject to compliance with requirements, provide diaphragm-type filter bank gages by one of the following:
1. Airguard Industries, Inc.
 2. Dwyer Instruments, Inc.

2.2 MERV-8 PARTICULATE AIR FILTERS

- A. **Description:** Factory-fabricated, self-supported, extended-surface, pleated, panel-type, disposable air filters with holding frames. Rigid, 4 inch thickness as indicated, MERV-8.
- B. Entire filter shall be legally disposable in landfills under the regulations of the authority having jurisdiction.
- C. **Media:** Non-woven cotton fabric type, at least 4.6 square feet of effective media area per 1.0 square feet of filter face area and not less than 15 pleats per linear foot.
1. Adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 2. Media shall be coated with an antimicrobial agent.
 3. Separators shall be bonded to the media to maintain pleat configuration.
 4. Welded wire grid shall be on downstream side to maintain pleat, with an effective open area of not less than 96%, bonded to the filter media.
 5. Media shall be bonded to frame to prevent air bypass.
 6. Support members on upstream and downstream sides to maintain pleat spacing.
- D. **Frame:** Rigid, heavy-duty, high wet-strength beverage board with diagonal support members bonded to both sides of each pleat. Bond frame to outer periphery of filter pack to prohibit air bypass.
- E. **Filter Unit Class:** UL 900, Class 2.

2.3 FILTER GAGES

- A. **Description:** Diaphragm type with dial and pointer in metal case, vent valves, black figures on white background, and front recalibration adjustment.
1. **Diameter:** 4½ inches.

2. Range: 0- to 3.0-inch wg.
-
- B. Accessories: Static pressure tips, tubing, gage connections, and mounting bracket.
- C. In addition to the above locally-reading gage, one or more remote-reading filter bank pressure gages shall be furnished and installed by the Installing Contractor.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Air filter will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION 15861P

SECTION 16269P - VARIABLE FREQUENCY DRIVES - PROCUREMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the procurement of enclosed, pre-assembled, combination VFDs, rated 600 V and less, for speed control of three-phase, squirrel-cage induction motors factory-mounted by the outdoor packaged modular air-handling unit manufacturer.
- B. The Owner will contract separately for the installation of the equipment furnished herein.
- C. Equipment manufacturer's field services related to the installation work shall be included as further described herein.

1.2 DEFINITIONS

- A. BAS: Building automation system.
- B. CE: Conformite Europeene (European Compliance).
- C. CPT: Control power transformer.
- D. EMI: Electromagnetic interference.
- E. IGBT: Insulated-gate bipolar transistor.
- F. LAN: Local area network.
- G. LED: Light-emitting diode.
- H. MCP: Motor-circuit protector.
- I. NC: Normally closed.
- J. NO: Normally open.
- K. OCPD: Overcurrent protective device.
- L. PCC: Point of common coupling.
- M. PID: Control action, proportional plus integral plus derivative.
- N. PWM: Pulse-width modulated.
- O. RFI: Radio-frequency interference.
- P. TDD: Total demand (harmonic current) distortion.
- Q. THD(V): Total harmonic voltage demand.
- R. VFD: Variable-frequency Drive.

1.3 SUBMITTALS

- A. Submit the following directly to the Owner for approval prior to release to production:**
1. **Product Data:** For each type and rating of VFD indicated. Include features, performance, electrical ratings, operating characteristics, shipping and operating weights, and furnished specialties and accessories.
 2. **Shop Drawings:** For each VFD indicated. Include dimensioned plans, elevations, and sections; and conduit entry locations and sizes, mounting arrangements, and details, including required clearances and service space around equipment.
 - a. Show tabulations of installed devices, equipment features, and ratings. Include the following:
 - 1) Each installed unit's type and details.
 - 2) Factory-installed devices.
 - 3) Enclosure types and details.
 - 4) Nameplate legends.
 - 5) Short-circuit current (withstand) rating of enclosed unit.
 - 6) Features, characteristics, ratings, and factory settings of each VFD and installed devices.
 - 7) Specified modifications.
 - b. Schematic and Connection Wiring Diagrams: For power, signal, and control wiring.
 3. **Product Certificates:** For each VFD, from manufacturer.
 4. **Harmonic Analysis Study and Report:** Comply with IEEE 399 and NETA Acceptance Testing Specification; identify the effects of nonlinear loads and their associated harmonic contributions on the voltages and currents throughout the electrical system. Analyze designated operating scenarios, including recommendations for VFD input filtering to limit TDD and THD(V) at each VFD to specified levels.
 5. **Load-Current and List of Settings of Adjustable Overload Relays:** Compile after motors have been installed and arrange to demonstrate that switch settings for motor-running overload protection suit actual motors to be protected.
- B. Submit the following to the installing contractor (whom will be identified to Respondent when that determination is made):**
1. **Operation and Maintenance Data:** For VFDs to include in operation and maintenance manuals. Include the following:
 - a. Manufacturer's written instructions for testing and adjusting thermal-magnetic circuit breaker and MCP trip settings.
 - b. Manufacturer's written instructions for setting field-adjustable overload relays.
 - c. Manufacturer's written instructions for testing, adjusting, and reprogramming microprocessor control modules.
 - d. Manufacturer's written instructions for setting field-adjustable timers, controls, and status and alarm points.

1.4 QUALITY ASSURANCE

- A. **Manufacturer Qualifications:** Provide Variable Frequency Drives from manufacturers regularly engaged in the manufacture of equipment of the types and capacities indicated, with such products in satisfactory use in similar service for not less than 5 years. Manufacturer must also maintain, within 100 miles of the project site, a service center capable of providing training, parts, and emergency maintenance and repairs.
- B. **Single-Source Responsibility:** Obtain Variable Frequency Drives from a single manufacturer.
- C. **Testing Agency Qualifications:** Member company of NETA or an NRTL.
- D. **Electrical Components, Devices, and Accessories:** Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- E. **Comply with NFPA 70.**
- F. **IEEE Compliance:** Fabricate and test VFD according to IEEE 344 to withstand seismic forces defined in Specification Section 13080.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. If stored in space that is not permanently enclosed and air conditioned, remove loose packing and flammable materials from inside controllers and install temporary electric heating, with at least 250 W per controller.

1.6 PROJECT CONDITIONS

- A. **Environmental Limitations:** Rate equipment for continuous operation, capable of driving full load without derating, for outdoor use.

1.7 COORDINATION

- A. Coordinate features of motors, load characteristics, installed units, and accessory devices to be compatible with the following:
 - 1. Torque, speed, and horsepower requirements of the load.
 - 2. Ratings and characteristics of supply circuit and required control sequence.
 - 3. Ambient and environmental conditions of installation location.

1.8 EXTRA MATERIALS:

- A. **Circuit Boards:** Provide 20 percent, but no less than one set of complete control sub-assemblies for the VFDs, such that spare control sub-assemblies are supplied for all of the VFDs.
- B. **Spare Fuses:** Ten percent, but not fewer than six of each type and rating of fuse used. Include spares for power fuses, potential transformer fuses, control power fuses, and fusible devices for fused circuit breakers.
- C. **Spare Indicating Lamps:**

1. Incandescent type: Ten percent, but not fewer than ten of each type installed.
2. LED type: Five percent, but not fewer than two of each type installed.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace VFDs that fail in materials or workmanship within specified warranty period.
1. Warranty Period for Entire Package: 5 years from date of Substantial Completion associated with installation of equipment by installing contractor.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. ABB.
 2. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 3. Rockwell Automation, Inc.; Allen-Bradley Brand.
 4. Toshiba International Corporation.
 5. Yaskawa Electric America, Inc; Drives Division.
- C. General Requirements for VFDs: Comply with UL 508C.
- D. Application: Variable torque.
- E. VFD Description: Variable-frequency power converter factory packaged in an enclosure, with integral disconnecting means and overcurrent and overload protection; listed and labeled by an NRTL as a complete unit; arranged to provide self-protection, protection, and variable-speed control of one or more three-phase induction motors by adjusting output voltage and frequency.
1. Units suitable for operation of NEMA MG 1, and motors as defined by mechanical specification section 15055 and NEMA MG 1, Section IV, Part 30, "Application Considerations for Constant Speed Motors Used on a Sinusoidal Bus with Harmonic Content and General Purpose Motors Used with Adjustable-Voltage or Adjustable-Frequency Controls or Both."
 2. Units suitable for operation of inverter-duty motors as defined by NEMA MG 1, Section IV, Part 31, "Definite-Purpose Inverter-Fed Polyphase Motors."
 3. Listed and labeled for integrated short-circuit current (withstand) rating by an NRTL acceptable to authorities having jurisdiction.
- F. Design and Rating: Match load type and type of connection used between motor and load.
- G. Output Rating: Three-phase; 10 to 60 Hz, with voltage proportional to frequency throughout voltage range; maximum voltage equals input voltage.

H. Unit Operating Requirements:

1. Input AC Voltage Tolerance: Plus 10 and minus 10 percent of VFD input voltage rating.
 2. Input AC Voltage Unbalance: Not exceeding 3 percent.
 3. Input Frequency Tolerance: Plus or minus 3 percent of VFD frequency rating.
 4. Minimum Efficiency: 96 percent at 60 Hz, full load.
 5. Minimum Displacement Primary-Side Power Factor: 96 percent under any load or speed condition.
 6. Minimum Short-Circuit Current (Withstand) Rating: 22kA.
 7. Ambient Temperature Rating: Not less than 14 deg F and not exceeding 104 deg F.
 8. Ambient Storage Temperature Rating: Not less than minus 4 deg F and not exceeding 140 deg F.
 9. Humidity Rating: Less than 95 percent (noncondensing).
 10. Altitude Rating: Not exceeding 3300 feet.
 11. Vibration Withstand: Comply with IEC 60068-2-6.
 12. Overload Capability: 1.5 times the base load current for 60 seconds; minimum of 1.8 times the base load current for three seconds.
 13. Starting Torque: Minimum 100 percent of rated torque from 3 to 60 Hz.
 14. Speed Regulation: Plus or minus 5 percent.
 15. Output Carrier Frequency: Selectable; 0.5 to 15 kHz.
 16. Stop Modes: Programmable; includes fast, free-wheel, and dc injection braking.
- I. Inverter Logic: Microprocessor based, 32 bit, isolated from all power circuits.
- J. Isolated Control Interface: Allows VFDs to follow remote-control signal over a minimum 40:1 speed range.
1. Signal: Electrical.
- K. Internal Adjustability Capabilities:
1. Minimum Speed: 5 to 25 percent of maximum rpm.
 2. Maximum Speed: 80 to 100 percent of maximum rpm.
 3. Acceleration: 0.1 to 999.9 seconds.
 4. Deceleration: 0.1 to 999.9 seconds.
 5. Current Limit: 30 to minimum of 150 percent of maximum rating.
- L. Self-Protection and Reliability Features:
1. Input transient protection by means of surge suppressors to provide three-phase protection against damage from supply voltage surges 10 percent or more above nominal line voltage.
 2. Loss of Input Signal Protection: Selectable response strategy, including speed default to a percent of the most recent speed, a preset speed, or stop; with alarm.
 3. Under- and overvoltage trips.
 4. Inverter overcurrent trips.
 5. VFD and Motor Overload/Overtemperature Protection: Microprocessor-based thermal protection system for monitoring VFDs and motor thermal characteristics, and for providing VFD overtemperature and motor overload alarm and trip; settings selectable via the keypad; NRTL approved.
 6. Critical frequency rejection, with three selectable, adjustable deadbands.
 7. Instantaneous line-to-line and line-to-ground overcurrent trips.

8. Loss-of-phase protection.
 9. Reverse-phase protection.
 10. Short-circuit protection.
 11. Motor overtemperature fault.
- M. Automatic Reset/Restart: Attempt three restarts after drive fault or on return of power after an interruption and before shutting down for manual reset or fault correction; adjustable delay time between restart attempts.
- N. Power-Interruption Protection: To prevent motor from re-energizing after a power interruption until motor has stopped, unless "Bidirectional Autospeed Search" feature is available and engaged.
- O. Bidirectional Autospeed Search: Capable of starting VFD into rotating loads spinning in either direction and returning motor to set speed in proper direction, without causing damage to drive, motor, or load.
- P. Torque Boost: Automatically varies starting and continuous torque to at least 1.5 times the minimum torque to ensure high-starting torque and increased torque at slow speeds.
- Q. Motor Temperature Compensation at Slow Speeds: Adjustable current fall-back based on output frequency for temperature protection of self-cooled, fan-ventilated motors at slow speeds.
- R. Integral Input Main Circuit Breaker Disconnecting Means and individual motor OCPD: NEMA KS 1, with pad-lockable, door-mounted handle mechanism.
1. Disconnect Rating: Not less than 115 percent of VFD input current rating.
 2. Disconnect Rating: Not less than 115 percent of NFPA 70 motor full-load current rating or VFD input current rating, whichever is larger.
 3. Auxiliary Contacts: NO/NC, arranged to activate before switch blades open.
 4. Auxiliary contacts "a" and "b" arranged to activate with circuit-breaker handle.
 5. NO alarm contact that operates only when circuit breaker has tripped.

2.2 CONTROLS AND INDICATION

- A. Status Lights: Door-mounted LED indicators displaying the following conditions:
1. Power on.
 2. Run.
 3. Overvoltage.
 4. Line fault.
 5. Overcurrent.
 6. External fault.
- B. Historical Logging Information and Displays:
1. Real-time clock with current time and date.
 2. Running log of total power versus time.
 3. Total run time.
 4. Fault log, maintaining last four faults with time and date stamp for each.

C. Indicating Devices: Digital display mounted flush in VFD door and connected to display VFD parameters including, but not limited to:

1. Output frequency (Hz).
2. Motor speed (rpm).
3. Motor status (running, stop, fault).
4. Motor current (amperes).
5. Motor torque (percent).
6. Fault or alarming status (code).
7. PID feedback signal (percent).
8. DC-link voltage (V dc).
9. Set point frequency (Hz).
10. Motor output voltage (V ac).

D. Control Signal Interfaces:

1. Electric Input Signal Interface:

- a. A minimum of two programmable analog inputs: 0- to 10-V dc, 4- to 20-mA dc.
- b. A minimum of six multifunction programmable digital inputs.

2. Output Signal Interface: A minimum of two programmable analog output signal(s) (0- to 10-V dc, 4- to 20-mA dc), which can be configured for any of the following:

- a. Output frequency (Hz).
- b. Output current (load).
- c. DC-link voltage (V dc).
- d. Motor torque (percent).
- e. Motor speed (rpm).
- f. Set point frequency (Hz).

3. Remote Indication Interface: A minimum of two programmable dry-circuit relay outputs (120-V ac, 1 A) for remote indication of the following:

- a. Motor running.
- b. Set point speed reached.
- c. Fault and warning indication (overtemperature or overcurrent).
- d. PID high- or low-speed limits reached.

E. PID Control Interface: Provides closed-loop set point, differential feedback control in response to dual feedback signals. Allows for closed-loop control of pumps for pressure, flow, or temperature regulation.

1. Number of Loops: Two.

F. BAS Interface: Factory-installed hardware and software to enable the BAS to monitor, control, and display VFD status and alarms. Allows VFD to be used with an external system within a multidrop LAN configuration; settings retained within VFD's nonvolatile memory.

1. Network Communications Ports: Ethernet and RS-422/485.

2.3 LINE CONDITIONING AND FILTERING

- A. **Input Line Conditioning:** Based on the harmonic analysis study and report, provide input filtering, as required, to limit TDD at input terminals of all VFDs to less than 8 percent and THD(V) to 3 percent.

2.4 ENCLOSURES

A. **VFD Enclosures:**

1. NEMA 1: When located inside the air handling unit.
2. NEMA 3R: Where located on the unit exterior.

2.5 ACCESSORIES

A. **General Requirements for Control-Circuit and Pilot Devices:** NEMA ICS 5; factory installed in VFD enclosure cover unless otherwise indicated.

1. **Push Buttons, Pilot Lights, and Selector Switches:** Heavy-duty type.
 - a. **Push Buttons:** Recessed types; momentary.
 - b. **Pilot Lights:** LED types; red; push to test.
 - c. **Selector Switches:** Rotary type.
 - d. **Stop and Lockout Push-Button Station:** Momentary-break, push-button station with a factory-applied hasp arranged so padlock can be used to lock push button in depressed position with control circuit open.

B. **Control Relays:** Auxiliary and adjustable solid-state time-delay relays.

C. **Phase-Failure, Phase-Reversal, and Undervoltage and Overvoltage Relays:** Solid-state sensing circuit with isolated output contacts for hard-wired connections. Provide adjustable undervoltage, overvoltage, and time-delay settings.

1. **Current Transformers:** Continuous current rating, basic impulse insulating level (BIL) rating, burden, and accuracy class suitable for connected circuitry. Comply with IEEE C57.13.

D. **Breather and drain assemblies,** to maintain interior pressure and release condensation in NEMA 250, Type 4 enclosures installed outdoors or in unconditioned interior spaces subject to humidity and temperature swings.

2.6 SOURCE QUALITY CONTROL

A. **Testing:** Test and inspect VFDs according to requirements in NEMA ICS 61800-2.

1. Test each VFD while connected to its specified motor.
2. **Verification of Performance:** Rate VFDs according to operation of functions and features specified.

B. VFDs will be considered defective if they do not pass tests and inspections.

- C. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The VFD shall be factory installed as part of the air handling unit. The Owner will contract separately for the installation of the equipment furnished herein at the jobsite.
- B. The VFD manufacturer's obligations for field services related to the installation work, as described below, shall be included as the work of this Procurement Contract. Coordination with the installing contractor by the equipment manufacturers is required for field services indicated herein. The installing contractor assumes responsibility for all coordination with equipment manufacturer's at time they take possession of procured equipment for installation relieving Owner of this responsibility.

3.2 FIELD QUALITY CONTROL

- A. **Manufacturer's Field Service:** Provide the services of a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
1. **Acceptance Testing Preparation:**
 - a. Test insulation resistance for each VFD element, bus, component, connecting supply, feeder, and control circuit.
 - b. Test continuity of each circuit.
 - B. **Supervise and witness the following tests and inspections. Report results in writing.**
 1. **Tests and Inspections:**
 - a. Inspect VFD, wiring, components, connections, and equipment installation. Test and adjust controllers, components, and equipment.
 - b. Test insulation resistance for each VFD element, component, connecting motor supply, feeder, and control circuits.
 - c. Test continuity of each circuit.
 - d. Verify that voltages at VFD locations are within 10 percent of motor nameplate rated voltages. If outside this range for any motor, notify Engineer before starting the motor(s).
 - e. Test each motor for proper phase rotation.
 - f. Perform each electrical test and visual and mechanical inspection stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - g. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 - h. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
 - C. VFDs will be considered defective if they do not pass tests and inspections.

- D. Prepare test and inspection reports, including a certified report that identifies the VFD and describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations made after remedial action.

3.3 STARTUP SERVICE

- A. Provide the services of a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.

3.4 ADJUSTING

- A. Provide the services of a factory-authorized service representative to perform adjusting.
 - 1. Program microprocessors for required operational sequences, status indications, alarms, event recording, and display features. Clear events memory after final acceptance testing and prior to Substantial Completion.
 - 2. Set field-adjustable switches, auxiliary relays, time-delay relays, timers, and overload-relay pickup and trip ranges.
 - 3. Adjust the trip settings of MCPs and thermal-magnetic circuit breakers with adjustable, instantaneous trip elements. Initially adjust to six times the motor nameplate full-load amperes and attempt to start motors several times, allowing for motor cool-down between starts. If tripping occurs on motor inrush, adjust settings in increments until motors start without tripping. Do not exceed eight times the motor full-load amperes (or 11 times for NEMA Premium Efficient motors if required). Where these maximum settings do not allow starting of a motor, notify Engineer before increasing settings.
 - 4. Set the taps on reduced-voltage autotransformer controllers.
 - 5. Set field-adjustable circuit-breaker trip ranges.
 - 6. Set field-adjustable pressure switches.

3.5 DEMONSTRATION

- A. Provide the services of a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, reprogram, and maintain VFDs.

END OF SECTION 16269P

AHU AIR HANDLING UNIT SCHEDULE (CONTINUED ON SHEET SK-M2)

PLAN MARK	TRAINE MODEL NO	LOCATION	SERVICE	VOLTS/ PHASE	SUPPLY FAN				RETURN FAN				COOLING COIL														
					HP	TYPE	SUPPLY CFM	TSP IN IN WC	ESP IN IN WC	HP	TYPE	RETURN CFM	TSP IN IN WC	ESP IN IN WC	MINIMUM OA	CAP MBH TOT MIN	SENS MIN	EAT (°F) DB/WB	LAT (°F) DB/WB	EWT (°F)	LWT (°F)	GPM	MAX WPD FT	MAX APD IN WC	ROWS	FINS PER FT MAX	MAX COIL FACE VEL (FPM)
AHU-27	PCC-100	LL MECHANICAL ROOM	1ST FL LOBBY	460/3	60	AIR FOIL	50,000	4.1	2.0	50	PLENUM	47,500	2.6	1.5	16,000	2529	1839	82.2/68.7	52.5/52.4	42	58	315	20	1.25	8	144	530
AHU-28	PCC-80	LL MECHANICAL ROOM	CONF. RMS. 280-287	460/3	40	AIR FOIL	37,800	3.5	2.0	-	-	-	-	-	12,180	1829	1346	84.8/68.1	52.5/52.3	42	58	228	20	1.25	8	144	530
AHU-29	PCC-80	LL MECHANICAL ROOM	CONF. RMS. 120-127	460/3	40	AIR FOIL	37,800	3.5	2.0	-	-	-	-	-	12,180	1829	1346	84.8/68.1	52.5/52.3	42	58	228	20	1.25	8	144	530
AHU-30	PCC-40	LL MECHANICAL ROOM	1ST & 2ND ADMIN	460/3	25	PLENUM	18,700	3.6	2.0	-	-	-	-	-	3,575	761	542	78.8/65.9	52.5/52.3	42	58	95	20	1.25	6	144	530
AHU-31	PCC-66	LL MECHANICAL ROOM	CONF. RMS. 274-276	460/3	30	AIR FOIL	30,900	3.5	2.0	-	-	-	-	-	9,400	1458	974	81.1/67.8	52.5/52.4	42	58	182	20	1.25	8	144	530
AHU-32	PCC-66	LL MECHANICAL ROOM	CONF. RMS. 130-132	460/3	30	AIR FOIL	30,900	3.5	2.0	25	PLENUM	29,400	1.7	1.25	9,400	1458	974	81.1/67.8	52.5/52.4	42	58	182	20	1.25	8	144	530
AHU-33	PCC-100	EXISTING ROOF	2ND FL LOBBY	460/3	75	AIR FOIL	50,000	5.6	2.5	40	AF	47,500	2.9	1.25	18,000	2529	1839	82.2/68.7	52.5/52.4	42	58	315	20	1.25	8	144	530
AHU-34	PCC-57	EXISTING ROOF	1ST & 2ND BSC.	460/3	40	AIR FOIL	30,000	5.2	2.5	25	AF	28,500	2.6	1.50	8,225	1372	926	80.5/67.3	52.5/52.2	42	56	171	20	1.25	8	144	530

Ross Baruzzini
 A SERVICE COMPANY
 WESTER GROVES, MO 63119
 T. 314-948-8300

**AMERICA'S CENTER
 HVAC AND LIGHTING IMPROVEMENTS
 ORIGINAL BUILDING**
 701 CONVENTION PLAZA
 ST. LOUIS, MISSOURI 63101

JOB NO. 1493-02P
 DATE 05-24-11
 DRAWN BY JAB
 REVIEWED BY BAC
 DRAWING NO. SK-M1

SOUND ATTENUATOR SCHEDULE

UNIT NO.	IAC MODEL NO.	SERVICE	CFM	MAX S.P. IN. WC	DYNAMIC INSERTION LOSS DB OCTAVE BAND & MID-FREQUENCY								W x L x H	NOTES
					1	2	3	4	5	6	7	8		
					63	125	250	500	1000	2000	4000	8000		
ST-33	3S	AHU-33	50,000	0.10	7	12	16	28	35	35	28	17	144"x36"x108"	1 2
ST-34	3S	AHU-34	30,000	0.10	7	12	16	28	35	35	28	17	114"x36"x74"	1 2

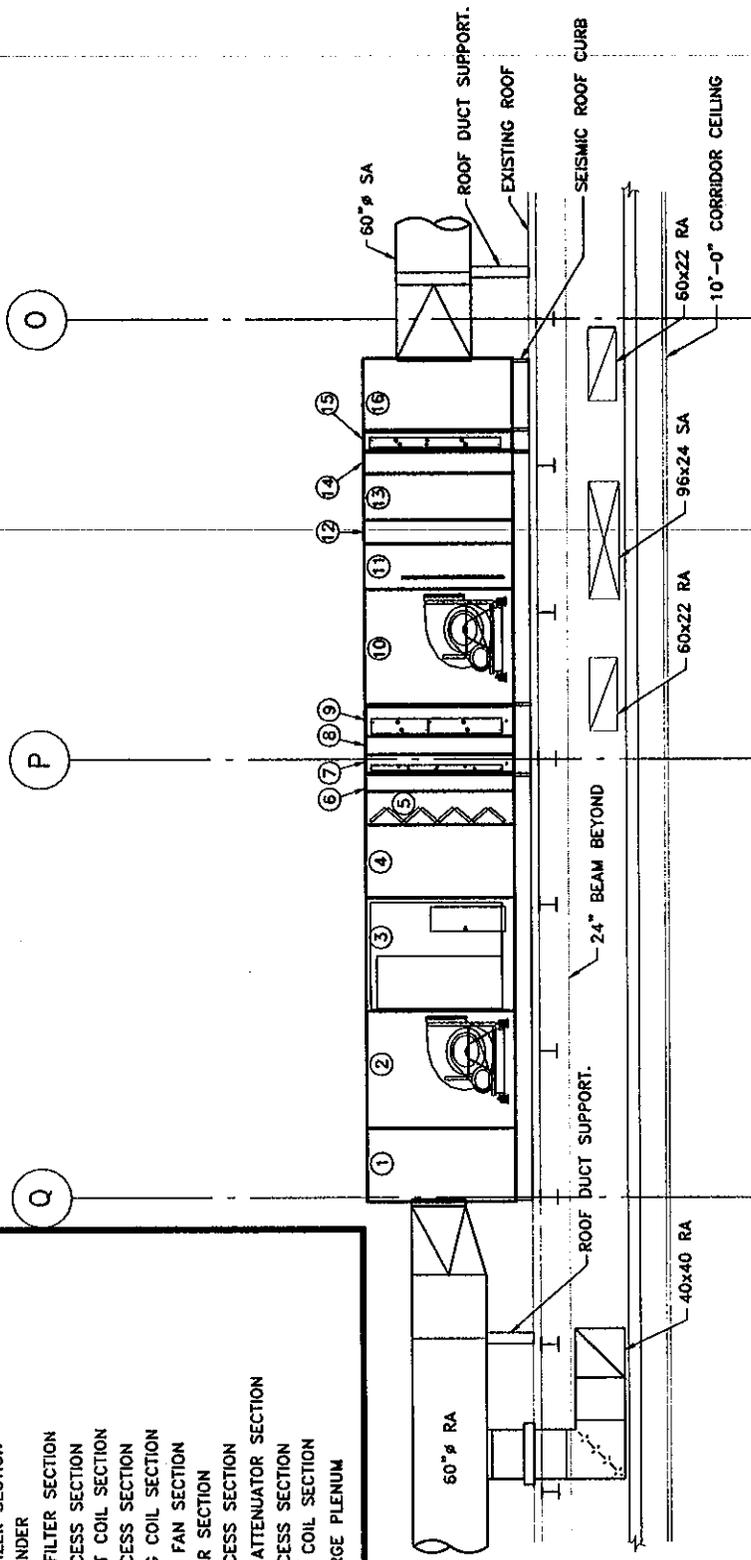
NOTES:

- 1 ALL SPLITTERS SHALL BE PARALLEL TO THE "H" DIMENSION.
- 2 TO BE FURNISHED AS PART OF AIR HANDLING UNIT WITH SEALED BLANK-OFF PANELS ON SIDES AND TOP AS REQUIRED.

Ross Baruzzini <small>4 SOUTH BUCKINGHAM WEBSTER GROVES, MO 63119 T. 314-938-8833</small>	AMERICA'S CENTER HVAC AND LIGHTING IMPROVEMENTS ORIGINAL BUILDING 701 CONVENTION PLAZA ST. LOUIS, MISSOURI 63101	JOB NO.: 1493-02P DATE: 05-24-13 DRAWN BY: JMB CHECKED BY: BAC DRAWING NO.: SK-M3
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AIR HANDLING UNIT 33 COMPONENTS

- ① INLET PLENUM
- ② RETURN FAN SECTION
- ③ ECONOMIZER SECTION
- ④ AIR BLENDER
- ⑤ ANGLE FILTER SECTION
- ⑥ 15" ACCESS SECTION
- ⑦ PREHEAT COIL SECTION
- ⑧ 15" ACCESS SECTION
- ⑨ COOLING COIL SECTION
- ⑩ SUPPLY FAN SECTION
- ⑪ DIFFUSER SECTION
- ⑫ 19" ACCESS SECTION
- ⑬ SOUND ATTENUATOR SECTION
- ⑭ 19" ACCESS SECTION
- ⑮ REHEAT COIL SECTION
- ⑯ DISCHARGE PLENUM



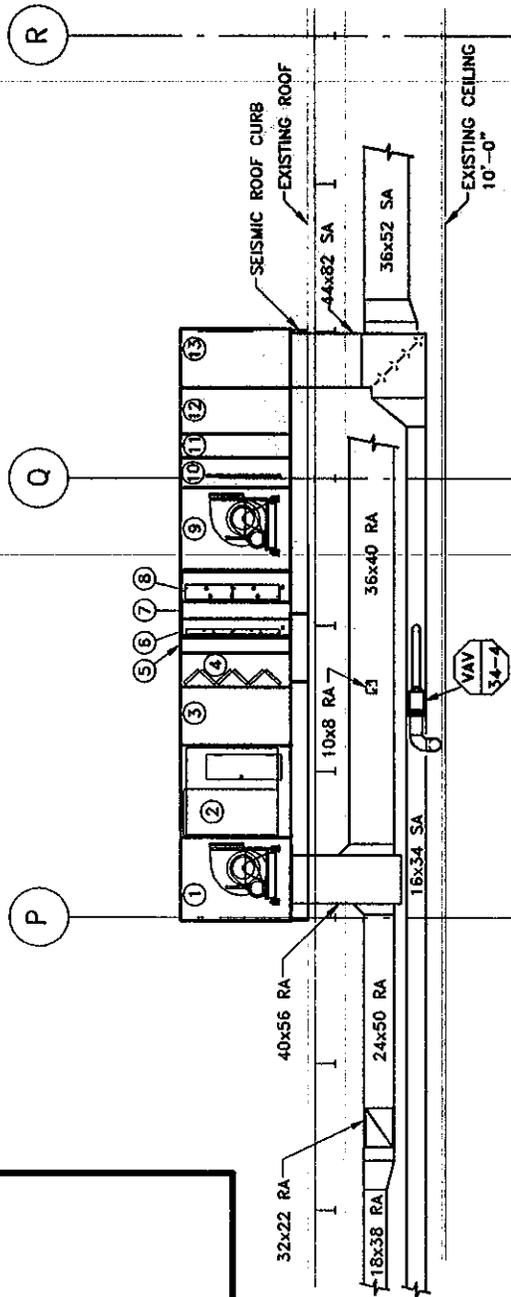
AHU-33 SECTION

SCALE: 1/8"=1'-0"

Ross Baruzzini 4 SOUTH GORHAM WEBSTER GROVES, MO 63119 T:314-486-8283	AMERICA'S CENTER HVAC AND LIGHTING IMPROVEMENTS ORIGINAL BUILDING 701 CONVENTION PLAZA ST. LOUIS, MISSOURI 63101	JOB NO.: 1493-02P	DRAWING NO.: SK-M4
	DATE: 05-24-11	DRAWN BY: JAB	REVIEWED BY: BAC

AIR HANDLING UNIT 34 COMPONENTS

- ① RETURN FAN SECTION
- ② ECONOMIZER SECTION
- ③ AIR BLENDER SECTION
- ④ ANGLE FILTER SECTION
- ⑤ 14" ACCESS SECTION
- ⑥ PREHEAT COIL SECTION
- ⑦ 14" ACCESS SECTION
- ⑧ COOLING COIL SECTION
- ⑨ SUPPLY FAN SECTION
- ⑩ DIFFUSER SECTION
- ⑪ 19" ACCESS SECTION
- ⑫ SOUND ATTENUATOR SECTION
- ⑬ DISCHARGE PLENUM



AHU-34 SECTION

SCALE: 1/8"=1'-0"

Ross & Paruzzini 6 SOUTHOLD ORCHARD WESTPORT, MISSOURI 63119 T. 314-853-5283	AMERICA'S CENTER HVAC AND LIGHTING IMPROVEMENTS ORIGINAL BUILDING 701 CONVENTION PLAZA ST. LOUIS, MISSOURI 63101		DRAWING NO.: SK-M5
	JOB NO.: 1493-02P	DATE: 05-24-11	DRAWN BY: JAB



**CITY OF ST. LOUIS
DEPARTMENT OF FINANCE
OFFICE OF THE SUPPLY COMMISSIONER**

FREDDIE L. DUNLAP
SUPPLY COMMISSIONER

FRANCIS G. SLAY
MAYOR

CITY HALL
1200 MARKET ST., ROOM 324
ST. LOUIS, MO 63103-2819
(314) 622-4580
FAX: (314) 622-4141

ATTENTION

Please carefully review all information requested in this bid package. Failure to submit required samples, literature, unit pricing, extended pricing, and any other requested information may result in disqualification of your bid or any portion of your bid.

- Two or more bids submitted for one item (item rejected).
- Signature missing on bid or any required form.
- Buy American Form not completed or returned (may be rejected).
- M/WBE Form not completed or returned (may be rejected).
- Altered or erased unit prices (must be initialed).
- Faxed bid, unless specifically requested (will be rejected).
- Failure to submit required Bond (for Contract only) by the date indicated.

The reasons indicated above may disqualify your bid. If you have any questions, please call the buyer indicated on the RFQ.

This form must be returned with your bid. I certify that I have read and understand the information above.

Manual Signature

Date

ST. LOUIS DOMESTIC PRODUCTS PROCUREMENT ACT

The City of St. Louis has enacted an ordinance relating to the purchase of domestic products by City government, with penalty provisions. The ordinance amends Section 5.58.010 Revised Code of the City of St. Louis, 1986, as amended by adding thereto new subsections dealing with the requirement that the Supply Commissioner or his designee give preference to goods or commodities manufactured in the United States of America, stating exceptions to said policy. Sections one through six are reprinted below.

Section One. Section 5.58.010 Revised Code of the City of St. Louis is hereby amended by adding the following language: Each solicitation to bid and the method of describing the items to be bid upon of any goods or commodities sought to be purchased by the Office of Supply Commissioner, and any contract entered into by and on behalf of the City of St. Louis and executed by the Mayor and/or the Comptroller of the City of St. Louis wherein the construction, alteration, repair or maintenance of any public works is the subject of the contract so executed, shall contain a provision that the goods or commodities furnished or used in the furtherance of said project by any contractor or subcontractor, manufacturer or supplier as the case may be, shall be manufactured, assembled or produced in the United States, and said requirement as defined above shall be stated in said bid.

Section Two. The provision of Section One of this Ordinance shall not apply in the following instances:

- (i) Where the item purchased as the contract entered into for repairs or renovation is less than One Thousand (\$1,000.00) Dollars.
- (ii) Where no line of a particular good or product is manufactured, assembled or produced in the United States.
- (iii) Where the acquisition of United States manufactured or produced goods would increase the cost by more than (10%) percent.

Section Three. The certificate required by this section shall specify the nature of the contract, the product being purchased or leased, the names and addresses of the United States manufacturers and producers contracted by the Commissioner or the project architect or engineer, and an indication that such manufacturers or producers could not supply sufficient quantities or that the price of the products would increase the cost of the contract by more than ten percent.

Section Four. No public agency may authorize, provide for, or make any payment to any vendor or contractor upon any contract in violation of section 2 of this act. Prior to the awarding of the bid and before any public agency authorizes, provides, or makes payment to any vendor or contractor upon any contract to which section 2 or 6 of this act applies, the vendor or contractor shall provide proof of compliance with section 2, and, if applicable, section 6 of this act. Any vendor or contractor who knowingly misrepresents any material fact to the public agency concerning the origin of any manufactured goods or commodities shall be guilty of a Class A misdemeanor.

Section Five. Sections 1 to 6 of this act shall apply only to contracts and subcontracts entered into after the effective date of this act, and shall not limit the use or supply of manufactured goods or commodities purchased or leased prior to the effective date of this act.

Section Six. Nothing in sections 1 or 6 of this act is intended to contravene any existing treaty, law, agreement, or regulation of the United States. All contracts under section 1 or 6 of this act shall be entered into in accordance with existing treaty, law, agreement, or regulation of the United States including all treaties entered into between foreign countries and the United States regarding export-import restrictions and international trade and shall not be in violation of sections 1 to 6 of this act to the extent of such accordance.

Interpretations and Guidelines

Section One: "Shall be manufactured" is interpreted to mean to make or process a raw material into a finished product or to turn-out in a mechanical manner. "Assembled" is interpreted to mean to fit or to join together the parts, gather, or to congregate in a manufacturing environment. "Produced" is interpreted to mean to create by manual or physical effort, to make or yield to customary product or products.

Section Two (i) This is interpreted to mean less than one thousand dollars in aggregate (total purchases).

(iii) When applying this subsection, multiply the cost of the foreign product by ten percent and compare the cost to the American product. If the American product cost is less than the sum of the cost of the foreign product plus ten percent, the award will be made to the vendor bidding the American product. The price paid by the City of St. Louis will be the actual price bid by the winning bidder.

Section Three: "Could not supply sufficient quantities" is interpreted to mean in order to meet the using agency's delivery schedule and in quantity specified.

Section Four: The vendor's authorized representative must complete a self-certification form, as required by the existing procedures previously indicated. These certification forms will be used to determine whether the manufacturer or producers could, or could not supply sufficient quantities, or the cost of the products would increase the contract by more than ten percent.

Prior to the City awarding the bid, the vendor shall provide certification that the product being bid is manufactured, assembled or produced in the United States or there is an existing treaty, law or regulation whereby the product bid shall be treated the same as product manufactured, assembled or produced in the United States. The procuring agency shall accept the self certification in order to apply the percentage differential that is applicable under this law. Failure to provide certification shall cause the city to presume that such product is not American made and preference shall not be considered for that product.

CERTIFICATION FORM ST. LOUIS DOMESTIC PRODUCTS PROCUREMENT ACT (BUY AMERICAN)

Bidders are advised of legislation enacted by the City of St. Louis which requires all manufactured goods or commodities used or supplied in the performance of this contract or any subcontract to be manufactured, assembled or produced in the United States, unless obtaining American made products would increase the cost of this contract by more than ten percent.

Section Four requires the vendor or contractor to certify his compliance with this legislation and if applicable, Section Six, if preference is claimed.

This legislation does not apply if the total bid is less than one thousand dollars (\$1,000.00).

Bids received will be evaluated on the basis of this legislation. Certificates of compliance must be completed and returned to be considered for preference. Failure to provide certification shall cause the City to presume that such product is not American made.

CERTIFICATION

If all the specified goods or products are manufactured, assembled or produced in the United States, check box at left and complete certification at the bottom of this form.

SECTION SIX CERTIFICATION

If any or all of the specified goods or products are manufactured, assembled or produced in a country other than the "United States", and exemption is requested because such product is Fair Trade Product: (a) list the country, other than the United States, where each good or product you propose to furnish is manufactured, assembled or produced; (b) check box at left of this paragraph and list corresponding commodities and (c) complete Section Six Documentation portion below.

Item Number(s)

Location Where Item Manufactured, Assembled or Produced

SECTION SIX DOCUMENTATION

The specified goods or products are treated as manufactured, assembled or produced in the United States under an existing treaty, law, agreement or regulation of the United States regarding export-import restrictions and international trade. List item Number(s) and Treaties covering item below.

DEFINITIONS

- MANUFACTURED** - to make or process a raw material into a finished product; create, or to produce or to turn-out in a mechanical manner.
- ASSEMBLED** - to fit or join together the parts in a manufacturing environment.
- PRODUCED** - create by manual or physical effort, to make or yield the customary product or products.

MUST BE COMPLETED AND SIGNED

I hereby certify that the above information is true and correct and further certify that this statement complies with all provisions of Section 5.58.010 Revised Code of the City of St. Louis, 1985, as amended.

FIRM NAME: _____

ADDRESS: _____

CITY: _____ **STATE:** _____ **ZIP:** _____

BY: _____

(SIGNATURE and TITLE)

**CITY OF ST. LOUIS/SUPPLY DIVISION
MINORITY/WOMEN BUSINESS ENTERPRISES FORM
(M/WBE FORM)**

A. Mayor's Executive Order #28, Section Six - Supply Contracts

1. The goal of the City of St. Louis is that 25% of the value of all contracts let and purchases made by the Supply Commissioner shall be let or made with Minority Business Enterprises (MBEs) and that 5% of the value of all contracts let and purchases made by the Supply Commissioner shall be let or made with Women's Business Enterprises (WBEs).
2. All contracts let by the Supply Division for the purchase or lease of materials, equipment, supplies, commodities or services, the estimated cost of which exceeds \$500, shall be subject to this goal.
3. The methods by which the Supply Commissioner shall pursue this goal shall include but not be limited to the following:
 - a. The Supply Commissioner shall solicit bids from minority business enterprises and women's business enterprises certified to supply the required materials, equipment, supplies or services;
 - b. St. Louis Airport Authority (SLAA) shall provide the Supply Commissioner with a list of minority business enterprises and women's business enterprises qualified to provide each of those commodities that the Supply Commissioner indicates are required by the City;
 - c. The Supply Commissioner shall notify SLAA prior to solicitation of bids whenever no such qualified businesses are available;
 - d. SLAA shall attempt to identify such qualified businesses, and if successful, shall notify the Supply Commissioner of their availability; and
 - e. The Supply Commissioner shall provide such minority business enterprises and women's business enterprises every practical opportunity to submit bids.
4. Joint ventures or mentor-protégé relationships between prime contractors and subcontractors with local MBE and WBE firms are encouraged.
5. Participation of MBE and WBE firms located outside the St. Louis Metropolitan Statistical Area (SMSA) shall not count toward the goals established in this order.

B. SUPPLY DIVISION POLICY

It is the policy of the Supply Division that all bids/contracts awarded adhere to the Mayor's Executive Order #28. All vendors are encouraged to comply with this policy and all other provisions of Executive Order #28. A copy of Executive Order #28 is available upon request. Each Vendor/Contractor (bidder) must complete, sign and return this M/WBE Form. Failure to complete, sign and return the M/WBE Form will result in the bid being declared non responsive and your bid may be eliminated.

C. OBLIGATION

The bidder agrees to make a good faith effort to ensure that M/WBE businesses have an opportunity to participate in the performance of contracts or subcontracts financed in whole or in part with City funds. The bidder will take all necessary and reasonable steps to ensure that said businesses have an opportunity to compete for and perform under this bid/contract. The bidder shall not discriminate on the basis of race, color, national origin or sex in the award and performance of bids/contracts. The Directory of Disadvantaged, Minority and Women Owned Business Enterprises certified by the City of St. Louis, can be viewed at www.mwdbe.org.

**CITY OF ST. LOUIS/SUPPLY DIVISION
MINORITY/WOMEN BUSINESS ENTERPRISES FORM
(M/WBE FORM)**

D. BID/CONTRACT IDENTIFICATION

Bid #: _____ or Contract Name: _____

Opening Date: _____ Your Bid Total: \$ _____

If your bid is \$500 or higher, please complete Section 'E'. We are NOT requesting information on how your company currently supports M/WBE suppliers. We want to know if there are opportunities you might consider to work with M/WBE suppliers for THIS SPECIFIC bid/contract.

E. ASSURANCE **MBE/WBE Goal: 25% MBE and 5% WBE (Minimum Participation)**

I, acting in my capacity as an officer of the undersigned bidder(s) if a joint venture, hereby assure the City of St. Louis that on this bid/contract my company will: **(CHECK ONLY ONE)**

Meet or exceed the M/WBE goal with: _____% MBE and _____% WBE Participation

Proposed MBE Vendor Name: _____ Amount \$ _____

Item or materials to be supplied by MBE Vendor: _____

Proposed WBE Vendor Name: _____ Amount \$ _____

Item or materials to be supplied by WBE Vendor: _____

Fail to meet the M/WBE goal, but made a good faith effort to meet the goals as follows:

_____ % MBE and _____ % WBE Participation (Enter Proposed Vendor information above.)

Not meet the M/WBE goal for the following reasons(s):(Check All That Apply)

<input type="checkbox"/>	Our Company is an MBE certified by the State of:
<input type="checkbox"/>	Our Company is a WBE certified by the State of:
<input type="checkbox"/>	We have contacted suppliers listed in the SLAA Directory but have received no reply
<input type="checkbox"/>	There are no subcontracting opportunities for this bid/contract
<input type="checkbox"/>	We are a Dealer and the order will be drop-shipped from the manufacturer to the user
<input type="checkbox"/>	We are the manufacturer and the order will be drop-shipped from the factory to the user
<input type="checkbox"/>	A letter of explanation is attached
<input type="checkbox"/>	Other reason: _____
<input type="checkbox"/>	_____

FIRM NAME: _____ FEDERAL ID NUMBER: _____

SIGNATURE: _____ FAX NUMBER: _____

PRINTED NAME: _____ DATE: _____

TITLE: _____ E-MAIL: _____

CITY OF ST LOUIS, MISSOURI
INSTRUCTION TO BIDDERS (for request for quotations - RFQs)

VENDORS SHOULD CAREFULLY READ THE FOLLOWING INSTRUCTIONS AND TERMS AND CONDITIONS, BEFORE SUBMITTING QUOTATION. **CAUTION: THIS IS NOT AN ORDER**

- Quotations will only be accepted on this form which must be returned in a **sealed envelope**. *The upper left corner of the envelope must include the following information: Vendor Name, Quotation Number and the Due By Date.* This information is also required on any mail delivered next day or overnight.
- Quotations should be typewritten or in ink. Altered or erased unit price(s) must be initialed. One copy of Quotation Sheet must be submitted, please retain a copy for your files.
- The Supply Commissioner reserves the right to reject any or all bids.
- The Supply Commissioner reserves the right to make awards on an item basis or on a total basis.
- Bidders must quote Unit Price(s) and Extension on each item. When an error appears on an extension, the Unit Price(s) will govern.
- When Quotation Sheet requests item(s) by brand name and your quote is for an alternate brand - show brand name(s) with model number(s) and attach full specifications.
- When Quotation Sheet has only a general description(s) of item(s) required - show brand name with model number(s) and attach full specifications.
- Suppliers shall not offer more than one bid on each item. Two or more quotations on the same item may cause a rejection of the bid. Suppliers must determine which one of their many styles or types fully meet the specification.
- Freight or delivery charges must be included in quote, or shown separately on quote, so bid can be evaluated.
- **Bids must arrive no later than NOON** on the date stated or will be rejected. Faxed or E-mailed bids are not accepted unless specifically requested.
- Bids will be publicly opened on the date specified beginning at NOON.
- Prices quoted will be considered firm.
- Bids having an acceptance limit of less than 30 days after opening date may be rejected.
- Time of proposed delivery must be stated in definite terms.
- Failure of Bidder to understand the item(s) requested or any part of the specifications will not be a valid reason for bidding on the wrong item(s). Any questions regarding description of item(s) requested should be cleared with the Buyer listed in the bid document.
- **Samples** when requested must be delivered before actual time of bid opening with each sample plainly tagged showing the name of Bidder, Quotation Number, Brand Name and lot number or quality. Submission of samples does not relieve bidder from meeting the specifications as outlined in the Bid Documents unless the bidder specifically states they are bidding on an alternate.
- All samples are to be submitted to the address listed below unless otherwise stated in Bid Documents.
- Deliveries must be accompanied by a packing slip or invoice, listing the Department, Quotation Number, and the exact quantities of each item included in the shipment.
- **ONLY U.S.P., N.F., OR N.N.D. DRUGS ARE ACCEPTABLE. ALL DRUGS MUST COME IN MANUFACTURER'S ORIGINAL PACKAGES, PROPERLY SEALED.**
- In the event the successful bidder fails to make delivery of any item or items that meet the conditions and requirements as outlined in this proposal within 7 days of time stated by bidder on face of this quotation sheet, the City reserves the right to purchase said item or items on the "OPEN MARKET" and charge any costs above the BID PRICE to the bidder.
- The laws of the State of Missouri provide that the City of St. Louis pay no State Sales or Use Tax or Federal Excise Taxes and these taxes should be excluded from your bid price. Federal Excise Tax Exemption Certificates will be furnished to successful bidder.
- Suppliers shall save harmless the City of St. Louis from the payment of any and all claims or demands arising out of any infringement, alleged infringement, or use of any patent or patented device, article, system, arrangement, material or process used by him in the execution of this contract.
- Supply Division hours are Monday through Friday - 8:00 A.M. to 5:00 P.M. Main Number: 314-622-4580.

All bids must be submitted in a SEALED ENVELOPE and mailed to:

**SUPPLY COMMISSIONER
1200 MARKET ST RM 324
ST LOUIS MO 63103-2842**