

CITY OF EVANSTON

SPECIFICATIONS AND BID DOCUMENTS
Construction Bid with Sub-contractors

BID NUMBER: 22-07
For
Evanston Public Library Ventilation Fan Upgrade
February 10, 2022



BID DUE DATE: **2:00 P.M., Tuesday, March 15, 2022**

VIRTUAL BID OPENING: **2:15 P.M., Tuesday, March 15, 2022**
Google Meet ID:
meet.google.com/erk-vjyw-pza
Phone Numbers:
[\(US\)+1 617-675-4444](tel:+16176754444)
PIN: 491 020 418 0044#

**NON-MANDATORY
PRE-BID MEETING** **9:00 A.M., February 18, 2022**
Google Meet ID:
meet.google.com/uag-zqgp-juf
Phone Numbers
[\(US\)+1 219-250-1928](tel:+12192501928)
PIN: 700 337 710#

BID BOND: **5% of Contract Amount**

**PERFORMANCE/MATERIAL
& LABOR PAYMENT BOND:** **100% of Contract Amount**

CONTRACT PERIOD: **Contract award through April 14, 2022**

ELECTRONIC BID SUBMITTAL:

Bid responses will only be accepted electronically
via E-bidding through DemandStar (WWW.DEMANDSTAR.COM)

**It is highly recommended that new DemandStar users complete the account
setup process prior to project due date/time.**

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***NOTE: THE SELECTED BIDDER WILL BE SUBJECT TO THE REGULATIONS CONTAINED IN CITY OF EVANSTON ORDINANCE 60-O-14 AMENDMENTS TO THE LOCAL EMPLOYMENT PROGRAM (LEP)**

**CITY OF EVANSTON
NOTICE TO BIDDERS**

Bids will be received by the City's Purchasing Office until 2:00 P.M. local time **Tuesday March 15, 2022** and will be publically read virtually via Google Meets at 2:15 P.M. Interested parties can use the following link: meet.google.com/erk-vjyw-pza or join by phone 617-675-4444 PIN: 491 020 418 0044# to access the virtual bid opening. Effective immediately, the City of Evanston will no longer accept hard copy paper submittals for any solicitation. Responses will only be accepted electronically via E-bidding through DemandStar (www.demandstar.com). Although registration is required, vendors can download solicitations and upload responses for free. Bids shall cover the following:

Evanston Public Library Ventilation Fan Upgrade
Bid Number: 22-07

The City of Evanston, Evanston Public Library is seeking bids for the removal and replacement of the main Library building AHU ventilation fans.

A non-mandatory pre-bid meeting will be held via Google Meets at 9:00 A.M. on Friday, February 18, 2022. Interested parties can use the following link to access the meeting: meet.google.com/uag-zqgp-juf or join by phone at (US)+1 219-250-1928 PIN: 700 337 710#. The above item shall conform to the Invitation for Bids on file in the Purchasing Office. Parties interested in submitting a bid should contact the Purchasing Office to receive a copy of the bid or see the City's website at: www.cityofevanston.org/business/bids-proposals/ or DemandStar at: www.demandstar.com.

The City of Evanston, Evanston Public Library (the City) in accordance with the laws of the State of Illinois, hereby notifies all Bidders that it will affirmatively ensure that the contract(s) entered into pursuant to this Notice will be awarded to the successful Bidders without discrimination on the ground of race, color, religion, sex, age, sexual orientation, marital status, disability, familial status or national origin. The State of Illinois requires under Public Works contracts that the general prevailing rate of wages in this locality be paid for each craft or type of worker hereunder. This requirement is in accordance with The Prevailing Wage Act (820 ILCS 130) as amended. The City of Evanston, Evanston Public Library reserves the right to reject any or all submittals or to accept the submittal(s) deemed most advantageous to the City.

The Evanston Public Library Board also reserves the right to award the contract to an Evanston firm if that firm's bid is within 5% of the low bid.

Each Bidder shall be required to submit with their bid a disclosure of ownership interest statement form in accordance with the provisions of City Code Section 1-18-1 *et seq.* Failure to submit such information will result in the disqualification of such bid.

Linda Thomas
Purchasing Specialist

INSTRUCTIONS TO BIDDERS/REQUIREMENTS FOR BIDDING (CONTRACTS OVER \$25,000)

1. ON-LINE NOTIFICATION OF SOLICITATIONS

The City is utilizing Demandstar.com (www.demandstar.com) for on-line notification purposes only for sealed bids when it is anticipated that the amount of the resulting contract will be in excess of its formal bid limit of \$25,000, such as this requirement. Interested Bidders are required to submit a sealed bid to the City by the date/time indicated for this requirement on the forms provided by the City.

2. SUBMISSION OF BIDS

- A. The City of Evanston, Evanston Public Library will no longer accept hard copy paper submittals for any solicitation. Responses will only be accepted electronically via E-bidding through DemandStar (WWW.DEMANDSTAR.COM). Although registration is required, vendors can download solicitations and upload bid responses for free. **Please refer to attached DemandStar E-bidding documents.**
- B. ANY BIDS RECEIVED AFTER THE TIME AND DATE SPECIFIED FOR THE RECEIPT OF BIDS WILL NOT BE ACCEPTED. It is the sole responsibility of the Bidder to insure that his or her bid is delivered by the stated bid opening time. THE CITY IS NOT RESPONSIBLE FOR INCOMPLETE UPLOADED SUBMITTALS.
- C. Bids will be opened on the date and time stated.
- D. Any Bidder may withdraw his or her bid by letter or with proper identification by personally securing his or her bid at any time prior to the stated bid opening time. No telephone request for withdrawal of bids will be honored.

3. PREPARATION OF BIDS

The Bidder must prepare the bid on the attached bid forms. Unless otherwise stated, all blank spaces on the bid form or pages must be filled in. Either a unit price, lump sum price, or a "no-bid", as the case may be, must be stated for each and every item and must be either typed in or written in ink.

4. SIGNING OF BIDS

- A. Bids which are signed for a partnership should be signed in the firm's name by all partners or in the firm's name by Attorney-in-Fact. If signed by Attorney-in-Fact, there should be attached to the bid a Power of Attorney evidencing authority to sign the bid, dated the same date as the bid and executed by all partners of the firm.
- B. Bids which are signed for a corporation should have the correct corporate name thereon and signature of an authorized officer of the corporation manually written below the corporate name following words "By: _____" title of office held by the person signing for corporation, which shall appear below signature of an officer.

- C. Bids which are signed by an individual doing business under a fictitious name should be signed in the name of the individual "doing business as. _____."
- D. The name of each person signing the bid shall be typed or printed below his or her signature.

5. CONSIDERATION OF BIDS

The Purchasing Specialist shall represent and act for the City in all matters pertaining to this bid and the contract in conjunction therewith.

6. WITHDRAWAL OF BIDS

Bidders may withdraw or cancel their bids at any time prior to the advertised bid opening time. After the bid opening time, no bid shall be withdrawn or canceled for a period of sixty (60) calendar days. When contract approval is required by another agency, such as the Federal Government or the State of Illinois, no bid shall be withdrawn or canceled for a period of ninety (90) calendar days.

7. ERRORS IN BIDS

Bidders are cautioned to verify their bids before submission. Negligence on the part of the respondent in preparing the bid confers no right for withdrawal or modification of the bid after it has been opened. In case of error in the extension of prices in the bid, unit prices will govern.

8. ADDENDA

- A. Any and all changes to the specifications/plans are valid only if they are included by written addendum to all Bidders. Each Bidder must acknowledge receipt of any addenda by indicating on the Bid form. Each Bidder, by acknowledging receipt of any addenda, is responsible for the contents of the addenda and any changes to the bid therein. Failure to acknowledge any addenda may cause the bid to be rejected.
- B. Addenda information is available over the internet at: [City of Evanston Notices to Bidders](#) or www.demandstar.com, or by contacting the Purchasing Office.

9. RESERVED RIGHTS

The City of Evanston, Evanston Public Library reserves the right at any time and for any reason to cancel his or her solicitation, to accept or reject any or all bids or any portion thereof, or to accept an alternate response. The City reserves the right to waive any immaterial defect in any response. The City may seek clarification from any respondent at any time, and failure to respond within a reasonable time period, or as otherwise directed, will be cause for rejection.

10. AWARD

It is the intent of the City to award a contract to the lowest responsible Bidder meeting specifications. The City reserves the right to determine the lowest

responsible Bidder on the basis of an individual item, groups of items, or in any way determined to be in the best interest of the City. Award will be based on the following factors (where applicable): (a) adherence to all conditions and requirements of the bid specifications; (b) price; (c) qualifications of the Bidder, including past performance, financial responsibility, general reputation, experience, service capabilities, and facilities; (d) delivery or completion date; (e) product appearance, workmanship, finish, taste, feel, overall quality, and results of product testing; (f) maintenance costs and warranty provisions; and (g) repurchase or residual value.

11. INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

Bidder's shall promptly notify the City of any ambiguity, inconsistency, or error that they discover upon examination of the bidding documents. Interpretations, corrections, and changes will be made by addendum. Each Bidder shall ascertain prior to submitting a bid that all addenda have been received and are acknowledged in the bid.

12. INCONSISTENCIES AND OMISSIONS

These specifications and the accompanying plans, if any, are intended to include all information necessary for the work contemplated. If, by inadvertence or otherwise, the plans or specifications omit some information necessary for that purpose, the contractor shall, nevertheless, be required to perform such work at no additional cost to the City so that the project may be completed according to the true intent and purpose of the plans and specifications.

13. CONDITIONS

Bidders are advised to become familiar with all conditions, instructions, and specifications governing his or her bid. Once the award has been made, failure to have read all the conditions, instructions and specifications of this contract shall not permit the Bidder to amend contract or to request additional compensation.

14. VERIFICATIONS OF DATA

- A. It is understood and agreed that the unit quantities given in these specifications are approximate only, and the contractor shall verify these quantities before bidding as no claim shall be made against the City on, or account of, any excess or deficiency in the same.
- B. The contractor shall have visited the premises and determined for itself, by actual observation, boring, test holes, or other means, the nature of all soil and water conditions (both above and below ground in the line of work) that may be encountered in all construction work under this contract. The cost of all such inspection, borings, etc. shall be borne by the contractor, and no allowance will be made for the failure of the contractor to estimate correctly the difficulties attending the execution of the work.

15. SPECIFICATIONS

Reference to brand names and numbers is meant to be descriptive, not restrictive,

unless otherwise specified. Bids on equivalent items will be considered, provided the Bidder clearly states exactly what is proposed to be furnished, including complete specifications. Unless the Bidder specifies otherwise, it is understood the Bidder is offering a referenced brand item as specified or is bidding as specified when no brand is referenced, and does not propose to furnish an "equal." The City reserves the right to determine whether a substitute offer is equivalent to, and meets the standard of quality indicated by the brand name and number.

16. SAMPLES

When samples of items are called for by the specifications, samples must be furnished free of expense, and if not destroyed in the evaluation process will be returned at the Bidder's expense upon request. Request for the return of samples must accompany the sample and must include a UPS/Fed-Ex Pickup Slip, postage, or other acceptable mode of return. Individual samples must be labeled with Bidder's name, invitation number, item reference, manufacturer's brand name and number.

17. REGULATORY COMPLIANCE

Each Bidder represents and warrants that the goods or services furnished hereunder (including all labels, packages and containers for said goods) comply with all applicable standards, rules and regulations in effect under the requirements of all Federal, State, and local laws, rules and regulations as applicable, including the Occupational Safety and Health Act as amended, with respect to design, construction, manufacture, or use for their intended purpose of said goods or services. Each Bidder must furnish a "Material Safety Data Sheet" in compliance with the Illinois Toxic Substances Disclosure to Employees Act when required.

18. PRICING

The price quoted for each item is the full purchase price, including delivery to destination, and includes all transportation and handling charges, materials or service costs, patent royalties, and all other overhead charges of every kind and nature. Unless otherwise specified, prices shall remain firm for the contract period.

19. DISCOUNTS

Prices quoted must be net after deducting all trade and quantity discounts. Where cash discounts for prompt payment are offered, the discount period shall begin with the date of receipt of a correct invoice or receipt or final acceptance of goods, whichever is later.

20. INSPECTION

Materials or equipment purchased are subject to inspection and approval at the City's destination. The City reserves the right to reject and refuse acceptance of items which are not in accordance with the instructions, specifications, drawings or data of Seller's warranty (express or implied). Rejected materials or equipment shall be removed by, or at the expense of, the Seller promptly after rejection.

21. BIDS AND PLAN DEPOSITS

- A. When required on the cover sheet, all bids shall be accompanied by a bid deposit in the amount specified. Bid deposits shall be in the form of cash, a certified check, or cashier's check drawn on a responsible bank doing business in the United States and shall be made payable to the City of Evanston. Bid Bonds are also acceptable. All bids not accompanied by a bid deposit, when required, will be rejected.
- B. The City will return the bid deposits of all but the 3 lowest qualified Bidders, whose deposit will be held until contract award or at the expiration of the sixty-day or ninety-day period for bid award.
- C. The bid deposit of the successful Bidder will be retained until contract documents have been executed and the Contractor has submitted all the required information. Failure to comply with the terms of this specification may be cause for forfeiture of said deposit.
- D. When required, plan deposits will be refunded should the plans be returned in good condition within 10 days of the bid opening.

22. DISPUTES

Any dispute concerning a question of fact arising under this bid shall be decided by the Purchasing Specialist, who shall issue a written decision to the Bidder. The decision of the Purchasing Specialist shall be final and binding.

23. CATALOGS

Each Bidder shall submit, when requested by the Purchasing Specialist, catalogs, descriptive literature, and detailed drawings, fully detailing features, designs, construction, appointments, finishes and the like not covered in the specifications, necessary to fully describe the material or work proposed to be furnished.

24. TAXES

- A. Federal Excise Tax does not apply to materials purchased by the City of Evanston, Evanston Public Library by virtue of Exemption Certificate No. A-208762, Illinois Retailers' Occupation Tax, Use Tax, and Municipal Retailers' Occupation Tax do not apply to materials or services purchased by the City of Evanston, Evanston Public Library by virtue of Statute.
- B. The City of Evanston, Evanston Public Library is exempt from Illinois Sales Tax by virtue of Exemption Identification number E9998-1750.
- C. The City's federal tax ID number is 36-6005870.

25. PERMITS & FEES

All Bidders awarded a contract must secure and pay for any licenses required by the City of Evanston, Evanston Public Library. Necessary building permits will be required, but all permit fees will be waived and moneys for same must not be included in any bid.

26. ROYALTIES & PATENTS

Seller must pay all royalties and license fees. Seller must defend all suits or claims for infringement of any patent, copyright or trademark rights, and must hold the City harmless from loss on account thereof.

27. LOCAL PREFERENCE POLICY

The Evanston City Council reserves the right to award the contract to an Evanston firm if the firm's bid is within five (5%) percent of the low bid of a non-Evanston firm.

28. POWER OF ATTORNEY

An Attorney-In-Fact, who signs any and all of the bond or contract bonds submitted with this bid, must file with each bond a certified and effectively dated copy of their Power of Attorney. These dates should be the same or after the date of the contract.

29. WARRANTY

- A. The contractor warrants that all goods and services furnished to the City shall be in accordance with specifications and free from any defects of workmanship and materials: that goods furnished to the City shall be merchantable and fit for the City's described purposes, and that no governmental law, regulation, order, or rule has been violated in the manufacture or sale of such goods.
- B. The contractor warrants all equipment furnished to be in acceptable condition, and to operate satisfactorily for a period of one (1) year from delivery of, or the completion of installation, whichever is latest, unless stated otherwise in the specifications, and that if a defect in workmanship and/or quality of materials are evidenced in this period, the Seller shall remit full credit, replace, or repair at City's discretion immediately, such equipment and/or parts that are defective at no additional cost to the City.
- C. The contractor warrants to the City that each item furnished hereunder, and any component part thereof, will be new and in conformity with the specifications in all respects, unless otherwise specified, and is of the best quality of its respective kind, free from faulty workmanship, materials, or design, and installed sufficiently to fulfill any operating conditions specified by the City.
- D. The contractor shall repair or replace any item or component part thereof found not to be in conformity with this paragraph provided the City notified the Seller of such nonconformity within one (1) year after initial use or within eighteen (18) months after delivery, whichever occurs first. In the event Seller fails to proceed diligently to so replace or repair within a reasonable time after receipt of such notice, the City may undertake or complete such replacement or repair for Seller's account, and the seller will be responsible for any additional costs. Acceptance shall not relieve the seller of its responsibility.

30. INCURRED COSTS

The City will not be liable for any costs incurred by Bidders in replying to this invitation for bids.

31. VARIANCES

Each Bidder must state or list by reference any variations to specifications, terms and/or conditions set forth herein with its bid.

32. INDEMNIFICATION

- A. The awarded Bidder/Contractor shall defend, indemnify and hold harmless the City and its officers, elected and appointed officials, agents, and employees from any and all liability, losses, or damages as a result of claims, demands, suits, actions, or proceedings of any kind or nature, including but not limited to costs, and fees, including attorney's fees, judgments or settlements, resulting from or arising out of any negligent or willful act or omission on the part of the Contractor or Contractor's sub-contractors, employees, agents or sub-contractors during the performance of this Agreement. Such indemnification shall not be limited by reason of the enumeration of any insurance coverage herein provided. This provision shall survive completion, expiration, or termination of this Agreement.
- B. Nothing contained herein shall be construed as prohibiting the City, or its officers, agents, or employees, from defending through the selection and use of their own agents, attorneys, and experts, any claims, actions or suits brought against them. The Contractor shall be liable for the reasonable costs, fees, and expenses incurred in the defense of any such claims, actions, or suits. Nothing herein shall be construed as a limitation or waiver of defenses available to the City and employees and agents, including but not limited to the Illinois Local Governmental and Governmental Employees Tort Immunity Act, 745 ILCS 10/1-101 *et seq.*
- C. At the City Corporation Counsel's option, Contractor must defend all suits brought upon all such Losses and must pay all costs and expenses incidental to them, but the City has the right, at its option, to participate, at its own cost, in the defense of any suit, without relieving Contractor of any of its obligations under this Agreement. Any settlement of any claim or suit related to this Project by Contractor must be made only with the prior written consent of the City Corporation Counsel, if the settlement requires any action on the part of the City.
- D. To the extent permissible by law, Contractor waives any limits to the amount of its obligations to indemnify, defend, or contribute to any sums due under any Losses, including any claim by any employee of Contractor that may be subject to the Illinois Compensation Act, 820 ILCS 305/1 *et seq.* or any other related law or judicial decision, including but not limited to, *Kotecki v. Cyclops Welding Corporation*, 146 Ill. 2d 155 (1991). The City, however, does not waive any limitations it may have on its liability under the Illinois Workers Compensation Act, the Illinois Pension Code or any other statute.

- E. The Contractor shall be responsible for any losses and costs to repair or remedy work performed under this Agreement resulting from or arising out of any act or omission, neglect, or misconduct in the performance of its Work or its sub-contractors' work. Acceptance of the work by the City will not relieve the Contractor of the responsibility for subsequent correction of any such error, omissions and/or negligent acts or of its liability for loss or damage resulting therefrom.
- F. All provisions of this Section 32 shall survive completion, expiration, or termination of this Agreement.

33. DEFAULT

Time is of the essence as to the awarded contract and, of delivery or acceptable items or rendering of services is not completed by the time promised, the City reserves the right, without liability, in addition to its other rights and remedies, to terminate the contract by notice effective when received by Seller, as to stated items not yet shipped or services not yet rendered and to purchase substitute items or services elsewhere and charge the Seller with all losses incurred. The City shall be entitled to recover its attorney's fees and expenses in any successful action by the City to enforce this contract.

34. GOVERNING LAW

This contract shall be governed by and construed according to the laws of the State of Illinois. In the event of litigation, the venue will be Cook County, Illinois.

35. EQUAL EMPLOYMENT OPPORTUNITY

- A. In the event of the contractor's noncompliance with any provision of the Illinois Human Rights Act or Section 1-12-5 of the Evanston City Code, the contractor may be declared non-responsible and therefore ineligible for future contracts or sub-contracts with the City of Evanston, Evanston Public Library, and the contract may be canceled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by Statute or regulation.
- B. During the performance of this contract, the contractor agrees as follows:
 - 1. That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin or ancestry, or age or physical or mental handicap that does not impair ability to work, and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization. Contractor shall comply with all requirements of City of Evanston, Evanston Public Library Code Section 1-12-5.
 - 2. That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without

discrimination because of race, color, religion, sex, national origin or ancestry.

3. That, if it hires additional employees in order to perform this contract, or any portion hereof, it will determine that availability (in accordance with the Fair Employment Commission's Rules and Regulations for Public Contracts) of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not underutilized.
4. That it will send to each labor organization or representative of workers with which it has or is bound by a collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the contractor's obligations under the Illinois Fair Employment Practices Act and the Fair Employment Practices Commission's Rules and Regulations for Public Contracts. If any such labor organization or representative fails or refuses to cooperate with the contractor in its efforts to comply with such Act and Rules and Regulations, the contractor will promptly so notify the Illinois Fair Employment Practices Commission and the contracting agency and will recruit employees from other sources when necessary to fulfill its obligations hereunder.
5. That it will submit reports as required by the Illinois Fair Employment Practices Commission's Rules and Regulations for Public Contracts, furnish all relevant information as may from time to time be requested by the Fair Employment Practices Commission or the contracting agency, and in all respects comply with the Illinois Fair Employment Practices Commission's Rules and regulations for Public Contracts.
6. That it will permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency, the City Manager, the Commission and the Illinois Fair Employment Practices Commission for purposes of investigation to ascertain compliance with the Illinois Fair Employment Practices Act and the Fair Employment Practices Act and the Fair Employment Practices Commission's Rules and Regulations for Public Contract.
7. That it will include verbatim or by reference the provisions of subsections (A) through (G) of this clause in every performance sub-contract as defined in Section 2.10(b) of the Fair Employment Practices Commission's Rules and Regulations for Public Contracts so that such provisions will be binding upon every such sub-contractor; and that it will also include the provisions of subsections (A), (E), (F), and (G) in every supply sub-contract as defined in Section 2.10(a) of the Fair Employment Practices Commission's Rules and Regulations for Public Contracts so that such provisions will be binding upon every such sub-contractor. In the same manner as with other provisions of this contract, the contractor will be liable for compliance with applicable provisions

of this clause by all its sub-contractors; and further it will promptly notify the contracting agency and the Illinois Fair Employment Practices Commission in the event any sub-contractor fails or refuses to comply therewith. In addition, no contractor will utilize any sub-contractor declared by the Fair Employment Practices Commission to be non-responsible and therefore ineligible for contracts or sub-contracts with the State of Illinois or any of its political subdivisions or municipal corporations.

36. M/W/EBE GOAL

The City of Evanston, Evanston Public Library has a goal of awarding 25% of its contracts to Minority-Owned, Women-Owned, and Evanston-based businesses (M/W/EBEs). All Bidders must state the proposed involvement of M/W/EBEs in completing a portion of the services required by the City by completing the attached M/W/EBE forms. Any questions regarding M/W/EBE compliance should be submitted in writing to Tammi Nunez, Purchasing Manager at tnunez@cityofevanston.org.

37. LOCAL EMPLOYMENT PROGRAM REQUIREMENTS

In an effort to increase hiring of economically disadvantaged Evanston residents on certain City construction projects, the contractor shall comply with the provisions of the City of Evanston's Local Employment Program Ordinance (LEP) set forth in Section 1-17-1 (C) of the Evanston City Code. The intent of the LEP is to have Evanston residents employed at the construction site as laborers, apprentices and journeymen in such trades as electrical, HVAC, carpenters, masonry, concrete finishers, truck drivers and other construction occupations necessary for the project. Any questions regarding LEP compliance should be submitted in writing to Tammi Nunez Purchasing Manager at tnunez@cityofevanston.org.

NOTE: CITY OF EVANSTON ORDINANCE 60-O-14 AMENDMENT LOCAL EMPLOYMENT PROGRAM (LEP) available on the City website at: Ordinance 60-O-14 Amendment LEP

38. Questions

All questions related to this bid document should be submitted in writing to Linda Thomas, Purchasing Specialist at liethomas@cityofevanston.org with a copy to John Devaney, at jdevaney@cityofevanston.org. Only inquiries received a minimum of seven (7) working days prior to the date set for the opening of bids, will be given any consideration.

39. COORDINATION OF EXISTING SITE WITH DRAWINGS

- A. Before submitting a bid, bidders shall carefully examine the drawings and specifications, visit the site, and fully inform themselves as to all conditions and limitations.
- B. Should a bidder find discrepancies in, or omissions from the drawings or specifications, or should be in doubt as to their meaning, the bidder should at once

notify the Purchasing Specialist, who will issue necessary instructions to all bidders in the form of an addendum.

40. AFFIRMATIVE ACTION IN SUB-CONTRACTING (EXCERPT FROM RESOLUTION 59-R-73)

“Contractor agrees that he shall actively solicit bids for the sub-contracting of goods or services from qualified minority businesses. At the request of the City, Contractor shall furnish evidence of his compliance with this requirement of minority solicitation.

Contractor further agrees to consider the grant of sub-contracts to said minority bidders on the basis of substantially equal bids in the light most favorable to said minority businesses. Contractor further affirms that in obtaining his performance and bid bonds, he will seek out and use companies who have records of, and/or who will make commitments to, the bonding of minority contractors on a rate basis comparable to their bonding of similar non-minority contractors. The contractor may be required to submit this evidence as part of the bid or subsequent to it.”

41. COMPLIANCE WITH LAWS

- A. The bidder shall at all times observe and comply with all laws, ordinances and regulations of the Federal, State, Local and City Governments, which may in any manner affect the preparation of bids or the performance of the contract.

42. QUALIFICATION OF BIDDERS

- A. All bidders must be qualified in accordance with the instructions, procedures and methods set forth in this specification.
- B. In awarding contract, City may take into consideration, skill, facilities, capacity, experience, ability, responsibility, previous work, financial standing of bidder, amount of work being carried on by bidder, quality and efficiency of construction equipment proposed to be furnished, period of time within which proposed equipment is furnished and delivered, necessity of prompt and efficient completion of work herein described. Inability of any bidder to meet requirements mentioned above may be cause for rejection of the bid. In addition, if the project covered by this contract is a minority set-aside project, the contractor's qualifications as a minority firm will determine the eligibility of the contractor to bid.

43. COMPETENCY OF BIDDER

- A. No bid will be accepted from or contract awarded to any person, firm or corporation that is in arrears or is in default to the City of Evanston, Evanston Public Library upon any debt or contract, or that is a defaulter, as surety or otherwise, upon any obligation to said City, or had failed to perform faithfully any previous contract with the City.
- B. The bidder, if requested, must present within forty eight (48) hours evidence satisfactory to the Purchasing Manager of performance ability and possession of necessary facilities, pecuniary resources and adequate insurance to comply with the terms of these specifications and contract documents.

44. PREFERENCE TO CITIZENS

The Contractor shall abide by the Illinois Preference Act, 30 ILCS 570 et seq., which stipulates that whenever there is a period of excessive unemployment in Illinois, defined as any month immediately following two (2) consecutive months during which the level of unemployment in Illinois exceeds five percent (5%) as measured by the U.S. Bureau of Labor Statistics in its monthly publication of employment and unemployment figures, the Contractor shall employ only Illinois laborers unless otherwise exempted as so stated in the Act. ("Illinois laborer" means any person who has resided in Illinois for at least 30 days and intends to become or remain an Illinois resident) Other laborers may be used IF Illinois laborers are not available or are incapable of performing the particular type of work involved if so certified by the Contractor and approved by the project engineer.

GENERAL CONDITIONS

1. BASIS OF AWARD

The City of Evanston, Evanston Public Library reserves the right to award a contract to a responsive and responsible Bidder(s) who submits the lowest total bid, or to reject any or all bids and bidding, when in its opinion the best interest of the City will be served by such action. The City reserves the right to consider the specified alternates in its evaluation of the bids.

2. BIDS (Lump Sum Bid)

A. LUMP SUM BID

1. The bidder is to submit a lump sum bid for each bid line on the Bid Form which includes all costs incidental to performing the specified work. It is understood and agreed that the unit quantities given in the supporting pages are approximate only and the bidder shall verify these quantities before bidding as no claim shall be made against the City on account of any excess or deficiency in the same.

2. Unit prices given in the supporting pages shall be used by the City and the Contractor for any subsequent changes in the contract.

3. QUANTITIES

Any quantities shown on the Bid Form are estimated only for bid canvassing purposes, the City has made a good faith effort to estimate the quantity requirements for the Contract term. The City reserves the right to increase or decrease quantities ordered under this contract.

4. CONTRACT TERM

Bidder must fully complete the work within the period specified herein after award of the contract by the City.

5. NOTICE TO PROCEED/ PURCHASE ORDER/ CONTRACT

A. The City issued Purchase Order serves as the City official Notice to Proceed. No work will be allowed prior to Contractor receipt of the City issued Purchase Order.

B. Upon approval of the required bonds and insurance documents, the City will issue a Purchase Order to the Contractor for the contract amount. All Applications for Payment must reference the Purchase Order number.

C. When it is necessary to issue a Change Order that increases/decreases the contract amount, a Change Order form will be issued and a modified Purchase Order will be issued reflecting the revised contract amount.

- D. When it is necessary to issue a Change Order that only increases/decreases the contract period, only a Change Order form will be issued establishing the revised contract period.
- E. Upon Award the contractor shall execute the Contractor Services Agreement.

6. PAYMENT

- A. Progress payments will be made in accordance with “Applications for Payment” and “Project Closeout” sections of the specifications, less a 10% retainage for each payment, which will be held until final acceptance of the work by the City. Certification of each Application for Payment will be made by the City’s representative.
- B. All payments will be made in accordance with *Illinois Local Government Prompt Payment Act*.

7. DECISIONS TO WITHHOLD CERTIFICATION FOR PAYMENT

- A. The City may not certify payment and may withhold payment in whole or in part, to the extent reasonably necessary to protect the City, if the quality of the work is not in accordance with the contract documents. If the City is unable to certify payment in the amount of the invoice, the City will promptly issue payment for the amount of the Work completed in accordance with the contract documents. The City may not certify payment due to any contractor negligence or contract non-compliance.
 - a. Defective work not remedied
 - b. Third party claims filed or reasonable evidence indicating probable filing of such claims
 - c. Failure of Contractor to make payments properly to Sub-contractors for labor, materials or equipment
 - d. Reasonable evidence that the work cannot be completed for the unpaid balance of the Contract Sum
 - e. Damage to the City or another contractor
 - f. Reasonable evidence that the work will not be completed within the Contract period and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay
 - g. Persistent failure to carry out work in accordance with the Contract Documents.

8. CHANGES IN WORK

- A. The City reserves the right to make changes in the plans and specifications by altering, adding to, or deducting from the work, without invalidating the contract. All such changes shall be executed under the conditions of the original contract, except that any claim for extension of time caused thereby shall be adjusted at the time of ordering such change.
- B. No change shall be made unless a written Change Order and/or modified Purchase Order is issued by the City stating that the City has authorized the change, and no

claim for an addition to the contract shall be valid unless so ordered.

- C. If such changes diminish the quantity of work to be done they shall not constitute a claim for damage or anticipated profits on the work, such increase shall be paid in one or more of the following ways:
 - 1. by estimate and acceptance in lump sum
 - 2. by unit prices named in the contract's bid form or subsequently agreed upon

9. DEDUCTION FOR UNCORRECTED WORK

If the City deems it expedient to correct work damaged or not done in accordance with the contract, the difference in value, together with a fair allowance for damage shall be deducted from the contract amount due. The value of such deduction shall be determined by the City.

10. CITY'S RIGHT TO TERMINATE CONTRACT

The City reserves the right, in addition to other rights to termination, to terminate the contracts in accordance with all provisions of the executed contract.

11. LIENS

- A. Neither the final payment nor any part of any retained percentages, shall become due until the contractor, if required, delivers to the City, a complete release of all liens arising out of this contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as it has knowledge or information the releases and receipts include all the labor and material for which a lien could be filed. If any lien remains unsatisfied after all payments are made the contractor shall refund to the City all moneys that the latter may be compelled to pay in discharging such a lien, including all costs and attorney's fees.

12. SEPARATE CONTRACTS

- A. The City reserves the right to let other contracts in connection with this work. The contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate his or her work with theirs. If any part of the contractor's work depends on proper execution or results upon the work of any other contractor, the contractor shall inspect and promptly report to the City any defects in such work that render it unsuitable for such proper execution and results. His or her failure to so inspect and report shall constitute an acceptance of other contractor's work as fit and proper.
- B. To insure the proper execution of his or her subsequent work, the contractor shall measure work already in place and shall at once report to the City any discrepancy between the executed work and the drawings which will affect his or her work.

13. PROTECTION & SAFEGUARDS

- A. Unless otherwise specified, the contractor, as a part of this contract, shall provide, erect and maintain temporary roads, fences, bracing, lights, warning signs, barricades, etc. necessary for the protection of the construction materials, adjacent property and the public.
- B. The contractor shall contact all utilities which will be affected by its operations and notify the owners of the utilities of its operations and their limits within forty-eight (48) hours prior to beginning construction. The contractor shall be responsible for damage to utilities and shall, at his or her own expense, restore such property to a condition equal to that which existed before its work, as may be directed by the owners.
- C. The contractor shall protect all work and unused materials of this contract from any and all damage and shall be solely responsible for the condition of such work and materials.

14. MATERIAL STORAGE

- A. On-site areas may be designated for material/equipment storage. The contractor will assume all risk and liability associated with the storage of material/equipment at on-site locations.

15. CLEANING UP

- A. The contractor shall at all time keep the premises free from accumulation of waste material or rubbish caused by its employees or work and at the completion of the work it shall remove all its rubbish, tools, and surplus materials from the premises, leaving the area in a neat and workmanlike condition. In case of dispute, the City may remove the rubbish and charge the cost to the contractor.
- B. Contractor recognizes that proper cleanup and removal of construction debris is an important safety consideration. The Contractor shall be solely responsible for daily construction site/area cleanup and removal of all construction debris in accordance with City-approved disposal practices. Contractor shall be solely responsible for identifying and removing at its expense all hazardous material and waste which it uses and generates.

16. RESTORATION OF SITE

- A. Prior to final payment, contractor shall fully restore all property disturbed or damaged during the course of this work. This includes, but is not limited to public property, (walks, curbs, roadways, trees, etc.) private property, and utilities. This shall also include removal of temporary facilities erected during the course of this contract and restoration of these areas.
- B. All restoration work shall be subject to the approval of the City and shall restore the property to a condition at least equal to that existing prior to the start of this contract.

- C. All restoration work of property damaged by contractor shall be accomplished at the sole expense of the contractor.

17. PREVAILING WAGE

- A. Prospective Bidders shall thoroughly familiarize themselves with the provisions of the above-mentioned Act and shall prepare any and all bids/bids in strict compliance therewith.

- B. **Effective September 1st - All work performed on new and existing projects must be submitted to Illinois Department of Labor through the certified transcript of payroll portal.** You may access the portal here: [Certified Transcript of Payroll Portal](#)

All contractors and sub-contractors on public works projects **must submit and upload certified payrolls** on a monthly basis to the **IDOL** online portal, provide a pdf copy to the City's project manager and business work force development coordinator, along with a statement affirming that such records are true and accurate, that the wages paid to each worker are not less than the required prevailing rate and that the contractor is aware that filing records her or she knows to be false is a Class B misdemeanor.

- C. The certified payroll record must include for every worker employed on the public works project the name, address, telephone number, social security number, job classification, hourly wages paid in each pay period, number of hours worked each day, and starting and ending time of work each day. These certified payroll records are considered public records and public bodies must make these records available to the public under the Freedom of Information Act, with the exception of the employee's address, telephone number and social security number. Any contractor who fails to submit a certified payroll or knowingly files a false certified payroll is guilty of a Class B misdemeanor.

- D. All certified payrolls shall be submitted in electronic format, preferably a PDF file.

- E. As a condition of receiving payment, Contractor must (i) be in compliance with the Agreement, (ii) pay its employees prevailing wages when required by law (Examples of prevailing wage categories include public works, printing, janitorial, window washing, building and grounds services, site technician services, natural resource services, security guard and food services). Contractor is responsible for contacting the Illinois Dept. of Labor 217-782-1710; <https://www2.illinois.gov/idol/Laws-Rules/CONMED/Pages/prevailing-wage-act.aspx> compliance with prevailing wage requirements), (iii) pay its suppliers and sub-contractors according to the terms of their respective contracts, and (iv) provide lien waivers to the City upon request.

18. CONTRACTOR REQUIREMENTS

- A. The Contractor shall abide by and comply with all local, State and federal laws and regulations relating to contracts involving public funds and the

development/construction of public works, buildings, or facilities. The scale of wages to be paid shall be obtained from Illinois Department of Labor and posted by the Contractor in a prominent and accessible place at the project work site.

- B. The Contractor certifies it has not been barred from being awarded a contract with a unit of State or local government as a result of bid rigging or bid rotating or any similar offense (720 ILCS 5/33 E-3, E-4).
- C. The Contractor certifies, pursuant to the Illinois Human Rights Act (775 ILCS 5/2-105), that it has a written sexual harassment policy that includes, at a minimum, the following information: (1) the illegality of sexual harassment, (2) the definition of sexual harassment under State law, (3) a description of sexual harassment utilizing examples, (4) the Contractor's internal complaint process including penalties, (5) legal recourse, investigation and complaint process available through the Illinois Department of Human Rights and the Human Rights Commission and directions on how to contact both; and (6) protection against retaliation as provided by Section 6-101 of the Illinois Human Rights Act.
- D. The Contractor shall abide by the "Illinois Preference Act" which stipulates that whenever there is a period of excessive unemployment in Illinois, defined as any month immediately following two (2) consecutive months during which the level of unemployment in Illinois exceeds five percent (5%) as measured by the U.S. Bureau of Labor Statistics in its monthly publication of employment and unemployment figures, the Contractor shall employ only Illinois laborers unless otherwise exempted as so stated in the Act. ("Illinois laborer" means any person who has resided in Illinois for at least 30 days and intends to become or remain an Illinois resident) Other laborers may be used IF Illinois laborers are not available or are incapable of performing the particular type of work involved if so certified by the Contractor and approved by the project engineer.

19. SUB-CONTRACTORS

- A. The term "sub-contract" means any agreement, arrangement or understanding, written or otherwise between a Contractor and any person (in which the parties do not stand in the relationship of an employer or an employee) for the furnishing of supplies or services or for the use of real or personal property, including lease arrangements, which, in whole or in part, is utilized in the performance of any one or more Contracts under which any portion of the Contractor's obligation under any one or more Contracts is performed, undertaken or assumed.
- B. The Bidder is specifically advised that any person, firm or party, to whom it is proposed to award a sub-contract under this contract must be acceptable to the City. Approval for the proposed sub-contract Award cannot be given by the City until the proposed Sub-contractor has submitted evidence showing that it has fully complied with any reporting requirements to which it is, or was, subject.
- C. The contractor, shall, within ten (10) days after award of the Contract, submit to the City in writing, names and addresses and respective amounts of money for

proposed contracts with Sub-contractors/major suppliers. The City will review and may direct the Contractor that they shall not employ any that are not acceptable as provided above.

- D. The sub-contractor shall abide by and comply with all local, State and federal laws and regulations relating to contracts involving public funds and the development/construction of public works, buildings, or facilities.

20. PAYMENTS TO SUB-CONTRACTORS

- A. Within seven days after the receipt of amounts paid by the City for work performed by a sub-contractor under this contract, the Contractor shall either:
 - 1. Pay the sub-contractor for the proportionate share of the total payment received from the City attributable to the work performed by the sub-contractor under this contract; or,
 - 2. Notify the City and sub-contractor, in writing, of his intention to withhold all or a part of the sub-contractor's payment and the reason for non-payment.
- B. The Contractor shall pay interest to the sub-contractor on all amounts owed that remain unpaid beyond the seven day period except for amounts withheld as allowed in item 2 above.
- C. Unless otherwise provided under the terms of this contract, interest shall accrue at the rate of one percent per month.
- D. The Contractor shall include in each of its sub-contracts a provision requiring each Sub-contractor to include or otherwise be subject to the same payment and interest requirements as set forth above with respect to each lower-tier sub-contractor.
- E. The Contractor's obligation to pay an interest charge to a sub-contractor pursuant to this provision may not be construed to be an obligation of the City.

21. BOND – PERFORMANCE, MATERIAL, & LABOR

- A. When required by the specifications herein, the successful Bidder or Bidders shall, within ten (10) calendar days after acceptance of the Bidder's bid by the City, furnish a performance bond for 100% of the full amount of the contract from insurance companies having not less than A+ Policyholders Rating from the most recent Alfred M. Best and Co., Inc. listing available. Certification of the insurance company's rating shall be provided prior to contract implementation and quarterly thereafter until contract completion. Should such rating fall below the required A+ level during performance of the contract, it will be the contractor's responsibility to notify the City and provide a new bond from an insurance company whose rating meets the City's requirements.

- B. When required by the specifications herein, all Bidders shall submit with the bid a bid bond. A letter of credit may be furnished in lieu of a bid bond only if the following conditions are met: 1) An irrevocable letter of credit must be obtained from an accredited bank which shall include an agreement that the bank will honor a demand by the City for payment due to Plaintiff failure to complete the project. 2) An irrevocable letter of credit must be in writing and signed by an authorized representative of the bank. 3) The irrevocable letter of credit must expressly state that it is irrevocable until the bid has been awarded. 4) The letter of credit must be for the percentage specified in the bid documents.
- C. The City may reject the use of an irrevocable letter of credit if the financial soundness of the issuing bank is found to be unacceptable.
- D. In the event that the Bidder fails to furnish a performance bond in said period of ten (10) calendar days after acceptance of the Bidder's bid by the City, the City may withdraw its acceptance of the bid and retain the Bidder's deposit as liquidated damages and not as a penalty.
- E. If the contractor has more than one project for which there is a contract with the City of Evanston, Evanston Public Library the contractor shall provide a separate Performance Bond for each project.

22. INDEMNITY

- A. The Contractor shall defend, indemnify and hold harmless the City and its officers, elected and appointed officials, agents, and employees from any and all liability, losses, or damages as a result of claims, demands, suits, actions, or proceedings of any kind or nature, including but not limited to costs, and fees, including attorney's fees, judgments or settlements, resulting from or arising out of any negligent or willful act or omission on the part of the Contractor or Contractor's sub-contractors, employees, agents or sub-contractors during the performance of this Agreement. Such indemnification shall not be limited by reason of the enumeration of any insurance coverage herein provided. This provision shall survive completion, expiration, or termination of this Agreement.
- B. Nothing contained herein shall be construed as prohibiting the City, or its officers, agents, or employees, from defending through the selection and use of their own agents, attorneys, and experts, any claims, actions or suits brought against them. The Contractor shall be liable for the reasonable costs, fees, and expenses incurred in the defense of any such claims, actions, or suits. Nothing herein shall be construed as a limitation or waiver of defenses available to the City and employees and agents, including but not limited to the Illinois Local Governmental and Governmental Employees Tort Immunity Act, 745 ILCS 10/1-101 *et seq.*
- C. At the City Corporation Counsel's option, Contractor must defend all suits brought upon all such Losses and must pay all costs and expenses incidental to them, but the City has the right, at its option, to participate, at its own cost, in the defense of any suit, without relieving Contractor of any of its obligations under this Agreement.

Any settlement of any claim or suit related to this Project by Contractor must be made only with the prior written consent of the City Corporation Counsel, if the settlement requires any action on the part of the City.

- D. To the extent permissible by law, Contractor waives any limits to the amount of its obligations to indemnify, defend, or contribute to any sums due under any Losses, including any claim by any employee of Contractor that may be subject to the Illinois Workers Compensation Act, 820 ILCS 305/1 et seq. or any other related law or judicial decision, including but not limited to, *Kotecki v. Cyclops Welding Corporation*, 146 Ill. 2d 155 (1991). The City, however, does not waive any limitations it may have on its liability under the Illinois Worker Compensation Act, the Illinois Pension Code or any other statute.
- E. The Contractor shall be responsible for any losses and costs to repair or remedy work performed under this Agreement resulting from or arising out of any act or omission, neglect, or misconduct in the performance of its Work or its sub-contractors' work. Acceptance of the work by the City will not relieve the Contractor of the responsibility for subsequent correction of any such error, omissions and/or negligent acts or of its liability for loss or damage resulting therefrom.

23. CONTRACTOR'S LIABILITY INSURANCE

- A. THE CONTRACTOR SHALL NOT COMMENCE WORK UNDER THIS CONTRACT UNTIL THEY HAVE OBTAINED ALL INSURANCE REQUIRED HEREIN AND SUCH INSURANCE HAS BEEN APPROVED BY THE CITY. Nor shall the contractor allow any sub-contractor to commence work until all similar insurance required of the sub-contractor has been so obtained.
- B. The City of Evanston, Evanston Public Library shall be named as an additional insured on the policy of the contractor for whatever the policy limits are for the contractor, but in no event shall the Comprehensive General Liability limits be less than \$3,000,000.00.
- C. If the contractor has more than one project for which he has a contract with the City of Evanston, Evanston Public Library there shall be separate Certificates of Insurance naming the City as an additional insured on each separate policy.
- D. In the event of accidents, injuries, or unusual events, whether or not any injury occurred, the contractor shall promptly furnish the City with copies of all reports of such incidents.
- E. The contractor shall furnish one (1) copy of a certificate, with the City named as an additional insured, showing the following minimum coverage with insurance company acceptable to the City.

24. PRE-CONSTRUCTION MEETING

- A. A pre-construction meeting will be scheduled for the successful Contractor at a date immediately following awarding of the Contracts.

25. LIQUIDATED DAMAGES

- A. The Contractor must commence work within 10 days of notice from the City and the work must be completed by 10/31/2022. In the event the work is not substantially completed by 10/31/2022, then in addition to any remedies available to the City, the Contractor will pay to the City the sum of **Five Hundred Dollars** per day for each calendar day beyond those dates, until substantial completion of the work has been achieved. This payment is for liquidated damages, in addition to any other damages that may be incurred by the City, and not as a penalty. All such liquidated damages may be set-off against any moneys that may be due the contractor.
- B. Substantial Completion shall be defined as the stage in the progress of the work when the work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the City can occupy or utilize the work for its intended use. Substantial Completion will be certified by the issuance of a Certificate of Substantial Completion, to be issued by the City's representative, when the Contractor has satisfied the above statement and billed the City for a minimum of 90% of the total value of the work.

26. EXTENSION OF TIME

- A. Delays due to causes beyond the control of the contractor other than such as reasonable would be expected to occur in connection with or during the performance of the work, may entitle the contractor to an extension of time for completing the work sufficient to compensate for such delay. No extension of time shall be granted, however, unless the contractor shall notify the City in writing thereof, within ten (10) days from the initiation of the delay and unless he shall, within ten (10) days after the expiration of the delay, notify the City in writing of the extension of time claimed on account thereof and then only to the extent, if any, allowed by the City.

27. DEFAULT

- A. The City may, subject to the provisions of this section, by written notice of default to Contractor, terminate the whole or any part of this contract in any one of the following circumstances:
1. if the Contractor fails to perform the services within the time specified herein, or any extension thereof; or
 2. if the contractor fails to perform any of the other provisions of this contract, or so fails to make progress as to endanger performance of this contract in accordance with its terms, and in either of these two circumstances does not cure failure within a period of 10 days (or such other extended period as the City may authorize in writing) after receipt of notice from the City specifying such failure

- B. In the event the City terminates this contract in whole or in part as provided in this section, the City may procure, upon such terms and in such manner as the City may deem appropriate, services similar to those so terminated, and the Contractor will be liable to the City for any excess costs for such similar services.
- C. The Contractor will not be liable for any excess of costs if acceptable evidence has been submitted to the City that the failure to perform the contract was due to causes beyond the control and without fault or negligence of the Contractor.
- D. Contractors who default may not be considered for awards of future City contracts.

28. USE OF PREMISES

- A. The contractor shall confine his apparatus, the storage of materials and the operations of his workers, to limits indicated by law, ordinances, permits or directions of the City.

29. DISCLOSURES AND POTENTIAL CONFLICTS OF INTEREST (30 ILCS 500/50-35)

- A. The City of Evanston's, Evanston Public Library's Code of Ethics prohibits public officials or employees from performing or participating in an official act or action with regard to a transaction in which he has or knows he will thereafter acquire an interest for profit, without full public disclosure of such interest. This disclosure requirement extends to the spouse, children and grandchildren, and their spouses, parents and the parents of a spouse, and brothers and sisters and their spouses.

To ensure full and fair consideration of all bids, the City of Evanston, Evanston Public Library requires all Bidders including owners or employees to investigate whether a potential or actual conflict of interest exists between the Bidder and the City of Evanston, Evanston Public Library its officials, and/or employees. If the Bidder discovers a potential or actual conflict of interest, the Bidder must disclose the conflict of interest in its bid, identifying the name of the City of Evanston, Evanston Public Library official or employee with whom the conflict may exist, the nature of the conflict of interest, and any other relevant information. The existence of a potential or actual conflict of interest does NOT, on its own, disqualify the disclosing Bidder from consideration. Information provided by Bidders in this regard will allow the City of Evanston, Evanston Public Library to take appropriate measures to ensure the fairness of the bidding process.

The City of Evanston, Evanston Public Library requires all bidders to submit a certification, enclosed with this bid packet, that the bidder has conducted the appropriate investigation and disclosed all potential or actual conflicts of interest.

By submitting a bid, all Bidders acknowledge and accept that if the City of Evanston, Evanston Public Library discovers an undisclosed potential or actual conflict of interest, the City of Evanston, Evanston Public Library may disqualify the Bidder and/or refer the matter to the appropriate authorities for investigation and prosecution.

INSURANCE REQUIREMENTS

<u>TYPE OF INSURANCE</u>	<u>MINIMUM INSURANCE COVERAGE</u>	
	Consequent Death Each Occurrence	Bodily Injury and Property Damage Aggregate
Commercial General Liability including:	\$3,000,000	\$3,000,000
<ol style="list-style-type: none"> 1. Comprehensive form 2. Premises - Operations 3. Explosion & Collapse Hazard 4. Underground Hazard 5. Products/Completed Operations Hazard 6. Contractual Insurance – With endorsement on the face of the certificate that it includes the "Indemnity" paragraph of the specifications. 7. Broad Form Property Damage - construction projects only 8. Independent contractors 9. Personal Injury 	<p>Insurance Certificate Must State: The City Of Evanston, Evanston, Evanston Public Library is an additional insured</p>	
Automobile Liability Owned, Non-owned or Rented	\$ 1,000,000	\$1,000,000
Workmen's Compensation and Occupational Diseases As required by applicable laws. Employer's Liability		\$ 500,000

Thirty day notice of cancellation required on all certificates.

EXHIBIT A – BID FORM
For
Evanston Public Library Ventilation Fan Upgrade

(BID #22-07)

1.01 BID TO:

THE CITY OF EVANSTON
2100 Ridge Avenue
Evanston, Illinois 60201

Hereinafter called "OWNER".

1.02 BID FROM:

(Hereinafter call "BIDDER")

Address

Telephone Number

Fax Number

1.03 BID FOR: **Evanston Public Library Ventilation Fan Upgrade**

1.04 ACKNOWLEDGEMENT:

A. The Bidder, in compliance with the Invitation for Bids, having carefully examined the Drawings and Project Manual with related documents and having visited the site of the proposed Work, and being familiar with all of the existing conditions and limitations surrounding the construction of the proposed project, including the structure of the ground, subsurface conditions, the obstacles which may be encountered, local restrictions, and all other relevant matters concerning the Work to be performed, hereby PROPOSES to perform everything required to be performed, and to provide all labor, materials, necessary tools and equipment, expendable equipment, all applicable permits and taxes and fees, and provide all utility and transportation services necessary to perform and complete in a workmanlike manner the Project in accordance with all the plans, specifications and

related Contract Documents as prepared by the City of Evanston, Evanston Public Library.

- B. The undersigned hereby acknowledges receipt of Invitation of Bids, Instruction to Bidder, the Project Manual, Drawings, and other Contract Documents and acknowledges receipt of the following Addenda:

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

1.05 GENERAL STATEMENTS

- A. The undersigned has checked all of the figures contained in this proposal and further understands that the Owner will not be responsible for any errors or omissions made therein by the undersigned.
- B. It is understood that the right is reserved by the Owner to reject any or all proposals, to waive all informality in connection therewith and to award a Contract for any part of the work or the Project as a whole.
- C. The undersigned declares that the person(s) signing this proposal is/are fully authorized to sign on behalf of the named firm and to fully bind the named firm to all the conditions and provisions thereof.
- D. It is agreed that no person(s) or company other than the firm listed below or as otherwise indicated hereinafter has any interest whatsoever in this proposal or the Contract that may be entered into as a result thereof, and that in all respects the proposal is legal and fair, submitted in good faith, without collusion or fraud.
- E. It is agreed that the undersigned has complied and/or will comply with all requirements concerning licensing and with all other local, state and national laws, and that no legal requirement has been or will be violated in making or accepting this proposal, in awarding the Contract to him, and/or in the prosecution of the Work required hereunder.
- F. To be considered a bona fide offer, this proposal must be completed in full and accompanied by a bid deposit or a bid bond when required by Contract Documents or Addenda.

1.06 ALTERNATES

- A. When alternate proposals are required by Contract Documents or Addenda thereto, the undersigned proposes to perform alternates for herein stated additions to or deductions from hereinbefore stated Base Bid. Additions and deductions include all modifications of Work or additional Work that the undersigned may be required to perform by reason of the acceptance of alternates.

1.07 ALLOWANCE

- A. The allowance is general and should be used in the event that any unforeseen condition is discovered. After discovering the unforeseen condition, the contractor shall submit a Found Condition Report (FCR) and an Authorization to Use Allowance (AUA) to the Consultant. The Consultant will then notify the Owner and both the Owner and the Consultant will view the unforeseen condition to determine if the work will be authorized. Under no circumstances shall the contractor move forward with the work in question nor shall the contractor expend allowance without an approved AUA. At the end of the project, unspent allowance shall be credited to owner via change order.

1.08 AGREEMENT

- A. In submitting this Bid, the undersigned agrees:
 - 1. To hold this Bid open for sixty (60) days from submittal date.
 - 2. To enter into and execute a Contract with the Owner within ten (10) days after receiving Notice of Award from the Owner.
 - 3. To accomplish the work in accordance with the Contract Documents.
 - 4. To complete the work by the time stipulated in the General Conditions
- B. The Owner reserves the right to reject any and all Bids and to waive any informalities in Bidding.

1.09 SCHEDULE

- A. See General Conditions for required schedule of completion dates.

1.10 PROPOSED PRICES

- A. The Bidder hereby proposes to furnish all labor, materials, equipment, transportation, construction plant and facilities necessary to complete, in a workmanlike manner and in accordance with the contract documents, the contract of work bid upon herein for compensation in accordance with the following prices:

BASE BID AMOUNT: \$ _____

ALLOWANCE (ADDITIONAL WORK – GENERAL): \$ 10% of total Bid

TOTAL BASE BID AMOUNT: \$ _____

ALTERNATE 1 –

The ADD/DEDUCT LUMP SUM PRICE, if awarded to the undersigned, shall be:

ALTERNATE 1 AMOUNT: \$ _____
Electrical Upgrades – Reference sheet E002

1.11 UNIT PRICING LIST

The undersigned submits the following UNIT PRICING LIST to be performed as shown on the Plans and/or described in the Specifications, and agrees that items of work not specifically mentioned in the Schedule which are necessary and required to complete the work intended shall be done incidental to and as part of the work for which a unit price is given, and understands that no additional payment will be made for such incidental work from the estimated quantities shown below. Unit prices for individual line items shall be used for the project's schedule of values, pay applications and will also be used to determine the amount to ADD TO or DEDUCT FROM the contract LUMP SUM PRICE for properly authorized additional or deducted work. In the event of a change to the contract the contractor shall be limited to markup percentages as indicated in Section 01028, 1.05, A. Bidders shall examine plans and determine actual work items and quantities for the work involved for bid analysis by the Owner.

Item	Description	Unit	Base Bid Quantity	Add Cost *	Deduct Cost **
1	TO BE COMPLETED BY CONSULTANT	XX	XX	\$	\$

* Add costs to be provided by Bidder

** Deduct costs to be provided by Bidder

1.12 BID SECURITY

If required by the bid documents, a scanned copy of the bid bond must be included with the bid electronic submission. The City is currently not able to accept a certified check, bank cashier's check or electronic bid bond at this time.

- A. The City of Evanston Civic Center is unable to receive in person drop-off and it is closed to the public. The original bid bond must be mailed within ten (10) days after the due date, to the City of Evanston Purchasing Department, 2100 Ridge Avenue - Room 4200 Evanston, Illinois 60201 Attention Purchasing Manager using the USPS (certified or priority), UPS or FedEx mail options in order to have a tracking number.
- B. Accompanying this electronic submittal is a scanned copy of a bank draft, bid bond, Cashier's check or Certified check as surety in the amount of not less than five percent (5%) of the Total Bid payable to the City of Evanston, Evanston Public Library..

The amount of the check or draft is: \$ _____

If this bid is accepted and the undersigned shall fail to execute a contract and contract bond as required it is hereby agreed that the amount of the check or draft

or bidder's bond substituted in lieu thereof, shall become the property of the City and shall be considered as payment of damages due to delay and other causes suffered by the City because of the failure to execute said contract and contract bond; otherwise said check or draft shall be returned to the undersigned.

In the event that one check or draft is intended to cover two or more bids, the amount must be equal to the sum of the project proposal guarantees of the individual sections covered.

If the check or draft is placed on another project proposal, state below where it may be found, as follows: The check or draft will be found in the project proposal for:

_____.

1.13 PERFORMANCE/PAYMENT BOND

The undersigned bidder agrees to provide Performance Bond and Payment Bond executed in accordance with Contract Performance Bond form furnished by and acceptable to the Owner written with _____

in the amount of 100% of the Contract Sum (Total Base Bid and all accepted alternatives and adjustments) the cost of which is included in the Bid.

Cost of bond for change order is _____ percent of change order cost.

1.14 LIQUIDATED DAMAGES

The undersigned Bidder understands and agrees to the provisions stated under "LIQUIDATED DAMAGES" in the General Conditions and shall be assessed at the specified daily rate for each calendar day or partial calendar day until completion as defined herein.

1.15 MATERIAL SUBSTITUTION SHEET

The following is a schedule of substitute materials I propose to furnish on this job, with the difference in price being added to or deducted from the Base Bid. The Base Bid is understood to include only those items which are definitely specified by trade names or otherwise.

I understand that if no price difference is indicated, then the selection of materials is optional with the Owner, and approval or rejection of the substitution below will be indicated prior to signing of Contracts.

<u>PRODUCT NAME AND/OR MANUFACTURER</u>	<u>ADD</u>	<u>DEDUCT</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

1.16 PROPOSAL SIGNATURE (REQUIRED)

A. SOLE PROPRIETOR

Signature of Bidder: _____

SUBSCRIBED AND SWORN to before me this _____ day of _____, 20__

Notary Public

Commission Expires: _____

B. PARTNERSHIP

Signature of All Partners: _____

Name (typed or printed)

Name (typed or printed)

SUBSCRIBED AND SWORN to before me this _____ day of _____, 20__

Commission Expires: _____

Notary Public

C. CORPORATION

Signature of Authorized Official: _____

Title: _____

Name above (typed or printed): _____

(If other than the president, attach a certified copy of that section of corporate by-laws or other authorization by the Corporation which permits the person to execute the offer for the Corporation.)

(Corporate Seal)

Attest: _____

Secretary

SUBSCRIBED AND SWORN to before me this _____ day of _____, 20__

Commission Expires: _____

Notary Public

1.17 DISCLOSURE

- A. The undersigned duly sworn deposes and says on oath that the bidder has withheld no disclosures of ownership interest and the information provided herein to the best of its knowledge is current and said undersigned has not entered into any agreement with any other bidder or prospective bidder or with any other person, firm or corporation relating to the price named in said proposal or any other proposal, nor any agreement or arrangement under which any person, firm or corporation is to refrain from bidding, nor any agreement or arrangement for any act or omission in restraint of free competition among bidders and has not disclosed to any person, firm or corporation the terms of this bid or the price named herein.

Bidder: _____

Business Address: _____

Telephone Number: _____

1.18 CONTACTS

- A. In the event the Evanston City Council approves this bid response, list the name, address, telephone, and fax number of the person to be contacted:

Bidder: _____

Address: _____

Telephone Number: _____

Fax Number: _____

1.19 REFERENCES

A. Provide three (3) references for which your firm has completed work of a similar scope in the past.

- 1. Name: _____
Address: _____
Contact Person: _____
Phone: _____
Contract Value: _____
Contract Dates: _____

- 2. Name: _____
Address: _____
Contact Person: _____
Phone: _____
Contract Value: _____
Contract Dates: _____

- 3. Name: _____
Address: _____
Contact Person: _____
Phone: _____
Contract Value: _____
Contract Dates: _____

EXHIBIT B

City of Evanston M/W/EBE Policy

A City of Evanston, Evanston Public Library's goal is to provide contracting and sub-contracting opportunities to Minority Business Enterprises, Women Business Enterprises, and Evanston Business Enterprises. The goal of the Minority, Women and Evanston Business Enterprise Program (M/W/EBE) is to assist such businesses with opportunities to grow. To assist such growth, the City's goal is to have general contractors utilize M/W/EBEs to perform no less than 25% of the awarded contract.

Firms bidding on projects with the City must work to meet the 25% goal or request a waiver from participation. It is advised that bidders place advertisements requesting sub-contractors and that they email or contact individual firms that would be appropriate to partner in response to the project. For samples of possible advertisements, see the City of Evanston's Business Diversity Section <http://www.cityofevanston.org/business/business-diversity/> ([Sample Advertisement](#)). If you request a paper copy of the additional documents, it will be available free of charge from the Purchasing Office, 2100 Ridge Road Suite 4200, Evanston, IL 60201.

If a bidder is unable to meet the required M/W/EBE goal, the Bidder must seek a waiver or modification of the goal on the attached forms. Bidder must include:

1. A narrative describing the Bidder's efforts to secure M/W/EBE participation prior to the bid opening.
2. Documentation of each of the assist agencies that were contacted, the date and individual who was contacted, and the result of the conversation (see form)
3. A letter attesting to instances where the bidder has not received inquiries/proposals from qualified M/W/EBEs
4. Names of owners, addresses, telephone numbers, date and time and method of contact of qualified M/W/EBE who submitted a proposal but was not found acceptable.
5. Names of owners, addresses, telephone numbers, date and time of contact of at least 15 qualified M/W/EBEs the bidder solicited for proposals for work directly related to the Bid prior to the bid opening (copies must be attached).

If a bidder is selected with a Sub-contractor listed to meet the M/W/EBE goal, a "monthly utilization report" will be due to the City prior to each payment being issued to the Contractor. This report will include documentation of the name of the firm hired, the type of work that firm performed, etc. Should the M/W/EBE not be paid according to the schedule proposed in this document, the City reserves the right to cancel the contract. Examples of this monthly form can be found on the City's website: <http://www.cityofevanston.org/business/business-diversity/> ([M/WEBE Monthly Utilization Report](#)).

EXHIBIT C

M/W/EBE PARTICIPATION COMPLIANCE FORM

I do hereby certify that

_____ (Name of firm) intends to participate as a Subcontractor or General Contractor on the project referenced above.

This firm is a (check only one):

_____ Minority Business Enterprise (MBE), a firm that is at least 51% managed and controlled by a minority, certified by a certifying agency within Illinois.

_____ Women's Business Enterprise (WBE), a firm that is at least 51% managed and controlled by a woman, certified by a certifying agency within Illinois.

_____ Evanston Based Enterprise (EBE), a firm located in Evanston for a minimum of one year and which performs a "commercially useful function".

Total proposed price of response \$ _____

Amount to be performed by a M/W/EBE \$ _____

Percentage of work to be performed by a M/W/EBE _____ %

Information on the M/W/EBE Utilized:

Name _____

Address _____

Phone Number _____

Signature of firm attesting to participation _____

Title and Date _____

Type of work to be performed _____

Please attach:

1. Proper certification documentation if applying as a M/WBE and check the appropriate box below. This M/WBE will be applying with documentation from:

- | | |
|--|--|
| <input type="checkbox"/> Cook County | <input type="checkbox"/> State Certification |
| <input type="checkbox"/> Federal Certification | <input type="checkbox"/> Women's Business Enterprise National Council |
| <input type="checkbox"/> City of Chicago | <input type="checkbox"/> Chicago Minority Supplier Development Council |

2. Attach business license if applying as an EBE

EXHIBIT D

M/W/EBE PARTICIPATION WAIVER REQUEST

I am _____ of _____, and I have authority to
(Title) (Name of Firm)

execute this certification on behalf of the firm. I _____ do
(Name)

hereby certify that this firm seeks to waive all or part of this M/W/EBE participation goal for the following reason(s):

(CHECK ALL THAT APPLY. SPECIFIC SUPPORTING DOCUMENTATION MUST BE ATTACHED.)

_____ 1. No M/W/EBEs responded to our invitation to bid.

_____ 2. An insufficient number of firms responded to our invitation to bid.

For #1 & 2, please provide a narrative describing the outreach efforts from your firm and proof of contacting at least 15 qualified M/W/EBEs prior to the bid opening. Also, please attach the accompanying form with notes regarding contacting the Assist Agencies.

_____ 3. No sub-contracting opportunities exist.

Please provide a written explanation of why sub-contracting is not feasible.

_____ 4. M/W/EBE participation is impracticable.

Please provide a written explanation of why M/W/EBE participation is impracticable.

Therefore, we request to waive _____ of the 25% utilization goal for a revised goal of _____%.

Signature: _____
(Signature)

Date: _____

EXHIBIT E

Construction Contractors' Assistance Organizations (“Assist Agencies”) Form

AGENCY	DATE CONTACTED	CONTACT PERSON	RESULT OF CONVERSATION
Association of Asian Construction Enterprises (AACE) 5500 Touhy Ave., Unit K Skokie, IL. 60077 Phone: 847-5259693 Perry Nakachii, President			
Black Contractors United (BCU) 400 W. 76th Street Chicago, IL 60620 Phone: 773-483-4000; Fax: 773-483-4150 Email: bcunewera@ameritech.net			
Chicago Minority Business Development Council 105 West Adams Street Chicago, Illinois 60603 Phone: 312-755-8880; Fax: 312-755-8890 Email: info@chicagomsdc.org Shelia Hill, President			
Evanston Minority Business Consortium, Inc. P.O. Box 5683 Evanston, Illinois 60204 Phone: 847-492-0177 Email: embcinc@aol.com			
Federation of Women Contractors 5650 S. Archer Avenue Chicago, Illinois 60638 Phone: 312-360-1122; Fax: 312-360-0239 Email: FWCChicago@aol.com Contact Person: Beth Doria Maureen Jung, President			
Hispanic American Construction Industry (HACIA) 901 W. Jackson, Suite 205 Chicago, IL 60607 Phone: 312-666-5910; Fax: 312-666-5692 Email: info@haciaworks.org			
Women’s Business Development Ctr. 8 S. Michigan Ave, Suite 400 Chicago, Illinois 60603 Phone: 312-853-3477 X220; Fax: 312-853-0145 Email: wdbc@wdbc.org Carol Dougal, Director			

PLEASE NOTE: Use of Construction Contractor’s Assistance Organization (Assist Agencies”) Form and agencies are for use as a resource only. The agencies and or vendors listed are not referrals or recommendations by the City of Evanston.

EXHIBIT F

CITY OF EVANSTON LOCAL EMPLOYMENT PROGRAM (LEP) COMPLIANCE

Effective Date January 1, 2015

City of Evanston Ordinance 60-O-14, Local Employment Program (LEP) New Penalties:

- **Ordinance 60-O-14**, Amendment to the MWEBE/LEP revising the penalty section from a \$100/per day to a 1.0% of total project value penalty can be found at: Ordinance 60-O-14 Amendment MWEBE LEP of the Evanston City Code Section 1-17-1 (C) can be found at Municode Library. The following are excerpts from Ordinance 60-O-14, Amending City Code Section 1-17-1(C) (11): Penalty.

If the contractor or sub-contractor fails to comply: The City may impose a fine up to one percent (1.0%) of the approved project price in total. Contractors or sub-contractors that are out of compliance due to a resident termination or resignation shall immediately notify the Business Workforce Compliance Coordinator of this occurrence within two (2) business days. Subsequently, the contractor or sub-contractor shall have five (5) additional business days to replace a terminated or resigned worker with another resident.

If the contractor or sub-contractor fails to comply: If the contractor or sub-contractor fails to make the replacement or to notify the Business Workforce Compliance Coordinator of this occurrence, the offending party will also be subject to a penalty up to one percent (1.0%) of the approved project price. If the noncompliant contractor makes a good faith effort to replace the resident, the fine may be waived.

If the contractor or sub-contractor fails to comply: At the sole discretion of the City, a contractor or sub-contractor that has violated the terms of the Local Employment Program within a three-year period may be determined a non-responsible bidder and excluded from bidding on future projects for a period of not less than one year.

If the employee (LEP Evanston resident) fails to comply: At the sole discretion of the City, an employee that has been hired through the LEP may be removed from the program for a period of not less than one year for failing to adhere to program guidelines or due to termination by the contractor for cause. Such termination process will be reviewed by the Business Workforce Compliance Coordinator.

****Detailed Local Employment Program Instructions “How to Comply” can be found at: [Local Employment Program Detailed Instructions](#)**

Local Employment Program or Exhibit F Questions: City staff is available for assistance to help with compliance. Submit questions in writing to Tammi Nunez, Purchasing Manager at tnunez@cityofevanston.org.

EXHIBIT F
LOCAL EMPLOYMENT PROGRAM COMPLIANCE
CITY CODE SECTION 1-17-1(C): LOCAL EMPLOYMENT PROGRAM

I have read and understood the requirements of the City of Evanston Local Employment Program (“LEP”) as set forth in City of Evanston Code Section 1-17-1(C): Local Employment Program. I intend to comply with the program as follows:

Estimated total labor cost = \$ _____ 15% of total labor cost = \$ _____

- _____ My total bid, including all alternates, is under \$250,000, and the LEP does not apply.
- _____ My total bid, including all alternates, is equal to or greater than \$250,000, and I already employ, and will continue to employ for the duration of the contract for which I am submitting this bid, Evanston residents (residing in zip codes 60201 or 60202) for at least 15% of all hours worked at the construction site by construction trade workers.
- _____ My total bid, including all alternates, is equal to or greater than \$250,000, and I will employ, for the duration of the contract for which I am submitting this bid, through use of the City of Evanston database or otherwise, Evanston residents (residing in zip codes 60201 or 60202) for at least 15% of all hours worked at the construction site by construction trade workers.
- _____ My total bid, including all alternates, is equal to or greater than \$250,000, and I have been unable to comply with the LEP requirements but am willing to work with the City to achieve compliance.
- _____ My total bid, including all alternates, is equal to or greater than \$250,000, and after having made sincere attempt to comply as noted below, I seek a waiver on a portion or all of the LEP requirements on this contract. Complete next section “Reasons for Waiver Request” below.

I UNDERSTAND THAT FAILURE TO COMPLY WITH THE LEP, REGARDLESS OF INTENT, MAY RESULT IN MAXIMUM PENALTY AS SET FORTH IN CITY CODE SECTION 1-17-1(C)(11), AS AMENDED.

WAIVER WILL BE GRANTED ONLY AFTER SINCERE ATTEMPT TO COMPLY*

REASONS FOR WAIVER REQUEST: PLEASE CHECK ALL THAT APPLY AND COMPLETE INFORMATION REQUESTED:

1. I have made sincere attempt as otherwise indicated below, but have nonetheless been unable to comply.
 - a. I do or will employ Evanston residents for the project, but such employment amounts to ____% of total labor cost.
2. The nature of the job is so technical that after having made sincere attempt as otherwise indicated below, I have been unable to locate any Evanston residents qualified to perform any aspects of the work. Please describe applicable job requirements/qualifications. Attach separate sheet if necessary:

*THE FOLLOWING DEMONSTRATE **SINCERE ATTEMPT TO COMPLY**: PLEASE CHECK EACH BOX COMPLETED, AS APPLICABLE:

3. I have utilized the local resident database and otherwise worked with the City in attempt to hire Evanston residents in compliance with LEP on this project, and have nonetheless been unable to comply;
4. I have placed one or more ads in a local newspaper seeking to hire Evanston residents in compliance with LEP on this project, and have nonetheless been unable to comply; and
5. If I am utilizing union labor, I have contacted Chicagoland labor unions to request Evanston residents for employment in compliance with LEP on this project, and have nonetheless been unable to comply.

I have read The City of Evanston, Local Employment Program (LEP) requirements as set forth in City Code Section 1-17-1(C): Local Employment Program. I understand and will comply with the LEP requirements for this project with respect to the job and/or any waiver, as applicable. **I UNDERSTAND THAT IF MY APPLICATION IS NOT COMPLETE, MY BID MUST BE REJECTED.**

SIGNED:

 Signature Printed Name and Title Date

On behalf of Company: _____

EXHIBIT H

DISCLOSURE OF OWNERSHIP INTERESTS

City of Evanston Ordinance 15-0-78 requires all persons (APPLICANT) seeking to do business with the City to provide the following information with their bid. Every question must be answered. If the question is not applicable, answer with "NA".

APPLICANT NAME: _____

APPLICANT ADDRESS: _____

TELEPHONE NUMBER: _____

FAX NUMBER: _____

APPLICANT is (**Check One**)

- 1. Corporation ()
- 2. Partnership ()
- 3. Sole Owner ()
- 4. Association ()
- 5. Other () _____

Please answer the following questions on a separate attached sheet if necessary.

SECTION I - CORPORATION

1a. Names and addresses of all Officers and Directors of Corporation.

1b. (Answer only if corporation has 33 or more shareholders.) Names and addresses of all those shareholders owning shares equal to or in excess of 3% of the proportionate ownership interest and the percentage of shareholder interest. (Note: Corporations which submit S.E.C. form 10K may substitute that statement for the material required herein.)

1c. (Answer only if corporation has fewer than 33 shareholders.) Names and addresses of all shareholders and percentage of interest of each herein. (Note: Corporations which submit S.E.C. form 10K may substitute that statement for the material requested herein.)

SECTION 2 - PARTNERSHIP/ASSOCIATION/JOINT VENTURE

2a. The name, address, and percentage of interest of each partner whose interests therein, whether limited or general is equal to or in excess of 3%.

2b. Associations: The name and address of all officers, directors, and other members with 3% or greater interest.

SECTION 3 - TRUSTS

3a. Trust number and institution.

3b. Name and address of trustee or estate administrator.

3c. Trust or estate beneficiaries: Name, address, and percentage of interest in total entity.

SECTION 4 - ALL APPLICANTS - ADDITIONAL DISCLOSURE

4a. Specify which, if any, interests disclosed in Section 1, 2, or 3 are being held by an agent or nominee, and give the name and address of principal.

4b. If any interest named in Section 1, 2, or 3 is being held by a "holding" corporation or other "holding" entity not an individual, state the names and addresses of all parties holding more than a 3% interest in that "holding" corporation or entity as required in 1(a), 1(b), 1(c), 2(a), and 2(b).

4c. If "constructive control" of any interest named in Sections 1, 2, 3, or 4 is held by another party, give name and address of party with constructive control. ("Constructive control" refers to control established through voting trusts, proxies, or special terms of venture of partnership agreements.)

I have not withheld disclosure of any interest known to me. Information provided is accurate and current.

Date

Signature of Person Preparing Statement

Title

ATTEST: _____
Notary Public

(Notary Seal)

Commission Expires: _____

EXHIBIT I

ADDITIONAL INFORMATION SHEET

Bid/Proposal Name: _____

Bid/Proposal Number #: _____

Company Name: _____

Contact Name: _____

Address: _____

City, State, Zip: _____

Telephone/FAX: # _____

E-mail: _____

Comments: _____

EXHIBIT J

**CERTIFICATE OF COMPLIANCE
WITH PREVAILING WAGE RATE ACT**

The undersigned, upon being first duly sworn, hereby certifies to the City of Evanston, Cook, County, Illinois, that all work under this contract shall comply with the Prevailing Wage Rate Act of the State of Illinois, 820 ILCS 130 *et seq*, and as amended by Public Acts 86-799 and 86-693 and current City of Evanston Resolution, with rates to be paid in effect at time work is performed. Contractors shall submit monthly certified payroll records to the city.

Name of Contractor: _____

By: _____

By: State of _____, County of _____

Subscribed and sworn to before me this _____ day
of _____, _____.

Notary Public

EXHIBIT L

CONFLICT OF INTEREST

_____, hereby certifies that it has conducted an investigation into whether an actual or potential conflict of interest exists between the Bidder, its owners and employees and any official or employee of the City of Evanston, Evanston Public Library.

Bidder further certifies that it has disclosed any such actual or potential conflict of interest and acknowledges if Bidder/proposer has not disclosed any actual or potential conflict of interest, the City of Evanston, Evanston Public Library may disqualify the bid/proposal.

(Name of Bidder/proposer if the Bidder/proposer is an Individual)
(Name of Partner if the Bidder/proposer is a Partnership)
(Name of Officer if the Bidder/proposer is a Corporation)

The above statements must be subscribed and sworn to before a notary public.
Subscribed and Sworn to this _____ day of _____, 20

Notary Public

(Notary Seal)

Commission Expires: _____

EXHIBIT M

SIGNATURE FORM

THE SECTION BELOW MUST BE COMPLETED IN FULL AND SIGNED

The undersigned hereby certifies that they have read and understand the contents of this solicitation and attached service agreements, and agree to furnish at the prices shown any or all of the items above, subject to all instructions, conditions, specifications and attachments hereto. Failure to have read all the provisions of this solicitation shall not be cause to alter any resulting contract or to accept any request for additional compensation. By signing this document, the proposer hereby certifies that they are not barred from bidding on this contract as a result bid rigging or bid rotating or any similar offense (720 ILCS 5/33 E-3, E-4).

Authorized Signature: _____

Company Name: _____

Typed/Printed Name: _____

Date: _____

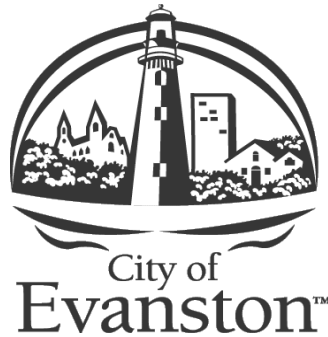
Title: _____

Telephone Number: _____

E-mail _____

Fax Number: _____

Exhibit N



CONTRACTOR SERVICES AGREEMENT

The parties referenced herein desire to enter into an agreement for professional services for

Evanston Public Library Ventilation Fan Upgrade

(BID #22-07)

THIS AGREEMENT (hereinafter referred to as the “Agreement”) is entered into between the City of Evanston, an Illinois municipal corporation with offices located at 2100 Ridge Avenue, Evanston Illinois 60201 (hereinafter referred to as the “City”), and *[Insert Contractor name here]*, with offices located at *[Insert Contractor address here]*, (hereinafter referred to as the “Contractor”). Compensation (the “Compensation”) for all basic services provided by the Contractor pursuant to the terms of this Agreement shall not exceed *[\$[Insert fee here]]*.

Revision March 2020

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RECITALS

WHEREAS, the City intends to retain the services of a qualified and experienced contractor for the following:

Upgrade Main building ventilation Fans

WHEREAS, this Agreement shall include the following documents which are attached hereto:

- a) City of Evanston Bid 22-07, attached as Exhibit A.
- b) Contractor's response to Bid 22-07, attached as Exhibit B.
- c) Any sub-contractor sub-contracts related to this Agreement, attached as Exhibit C.
- d) Project Fee Schedule and hourly rates, attached as Exhibit D *(if appropriate)*.

NOW, THEREFORE, in consideration of the mutual covenants hereinafter set forth, the parties agree as follows:

1 Services and Duties of the Contractor

1.1 The Contractor shall perform professional services and provide equipment (the "Work") in accordance with Exhibits A, B, C and D. The Contractor retains the right to control the manner of performance of the services provided for in this Agreement and is an independent contractor and not agent or an employee of the City. All employees and sub-contractors of the Contractor shall likewise not be considered to be employees of the City. Contractor is solely responsible for the means and methods of all work performed under the terms of this Agreement for this Project ("the Project"). Contractor is an independent Contractor and is solely responsible for all taxes, withholdings, and other statutory or contractual obligations of any sort, including but not limited to, Worker's Compensation Insurance. Nothing in this Agreement accords any third-party beneficiary rights whatsoever to any non-party to this Agreement that any non-party may seek to enforce. Contractor acknowledges and agrees that should Contractor or its sub-contractors provide false information, or fail to be or remain in compliance with this Agreement; the City may void this Agreement.

1.2 The Contractor warrants and states that it has read the Contract Documents, and agrees to be bound thereby, including all performance guarantees as respects Contractor's work and all indemnity and insurance requirements. Contractor further affirms that it has visited the Project site and has become familiar with all special conditions, if any, at the Project site. Contractor shall perform the Work and its obligations under this Agreement in accordance with and subject to the Contract Documents to the full extent that each such provision is applicable to the Work. Contractor shall take necessary precautions to properly protect the Work of others, if any, from damage caused by operations under this Agreement. In addition, Contractor shall protect the work during normal and adverse weather conditions until the Project is complete and accepted by the City, or until the Contractor has fully completed its work under this Agreement. Contractor's obligations include, but

EXHIBIT N

are not limited to, placing and adequately maintaining at or about all locations of Project work, sufficient guards, barricades, lights, and enclosures to protect the Work.

1.3 The Contractor shall not have any public or private interest and shall not acquire directly or indirectly any such interest which conflicts in any manner with the performance of its services under this Agreement.

1.4 The Contractor shall designate, in writing, a person to act as its Project Manager for the work to be performed under this Agreement. Such person shall have complete authority to transmit instructions, receive information, interpret and define the Contractor's policies and decisions with respect to the work covered by this Agreement.

1.5 The Contractor shall employ only persons duly licensed by the State of Illinois to perform the professional services required under this Agreement for which applicable Illinois law requires a license, subject to prior approval of the City. The Contractor shall employ only well qualified persons to perform any of the remaining services required under this Agreement, also subject to prior approval of the City. The City reserves the right to require replacement of Contractor, sub-contractor, or supplier personnel for any reason. Contractor will replace the unacceptable personnel at no charge to the City. For all solicitations or advertisements placed by or on behalf of Contractor for employees for this Project it will state that the Contractor is an Equal Opportunity Employer.

1.6 Pursuant to the Illinois Freedom of Information Act, 5 ILCS 140/7(2), records in the possession of others whom the City has contracted with to perform a governmental function are covered by the Act and subject to disclosure within limited statutory timeframes (five (5) working days with a possible five (5) working day extension). Upon notification from the City that it has received a Freedom of Information Act request that calls for records within the Contractor's control, the Contractor shall promptly provide all requested records to the City so that the City may comply with the request within the required timeframe. The City and the Contractor shall cooperate to determine what records are subject to such a request and whether or not any exemption to the disclosure of such records, or part thereof, is applicable. Contractor shall indemnify and defend the City from and against all claims arising from the City's exceptions to disclosing certain records which Contractor may designate as proprietary or confidential. Compliance by the City with an opinion or a directive from the Illinois Public Access Counselor or the Attorney General under FOIA, or with a decision or order of Court with jurisdiction over the City, shall not be a violation of this Section.

1.7 The Contractor shall obtain prior approval from the City prior to sub-contracting with any entity or person to perform any of the work required under this Agreement. The Contractor may, upon request of the City, submit to the City a draft sub-contractor agreement for City review and approval prior to the execution of such an agreement. Any previously entered into sub-contractor agreement(s) are attached as Exhibit C. If the Contractor sub-contracts any of the services to be performed under this Agreement, the sub-contractor agreement shall provide that the services to be performed under any such agreement shall not be sublet, sold, transferred, assigned or otherwise disposed of to another entity or person without the City's prior written consent. The Contractor shall

be responsible for the accuracy and quality of any sub-contractor's work.

1.8 The Contractor shall cooperate fully with the City, other City contractors, other municipalities and local government officials, public utility companies, and others, as may be directed by the City. This shall include attendance at meetings, discussions and hearings as requested by the City. This cooperation shall extend to any investigation, hearings or meetings convened or instituted by OSHA relative to this Project, as necessary. Contractor shall cooperate with the City in scheduling and performing its Work to avoid conflict, delay in or interference with the work of others, if any, at the Project.

1.9 The Contractor acknowledges that it shall enforce and comply with all applicable Occupational Safety and Health Administration standards (OSHA) for this Project in effect as of the date of the execution of this Agreement, or as otherwise promulgated by OSHA in the future taking effect during the pendency of this Project. Contractor shall enforce all such standards and ensure compliance thereto as to its own agents and employees, and as to the agents and employees of any sub-contractor throughout the course of this Project. Contractor is solely responsible for enforcing and complying with all applicable safety standards and requirements on this Project, and is solely responsible for correcting any practices or procedures which do not comply with the applicable safety standards and requirements for this Project. Any Project specific safety requirements applicable to this Project must be followed by Contractor and any sub-contractor(s) on the Project. Additionally, all such safety requirements shall be made a part of any sub-contractor agreement.

1.10 The Contractor shall submit to the City a progress report each month this Agreement is in effect. The report shall include the following items:

- a) A summary of the Contractor's project activities, and any sub-contractor project activities that have taken place during the invoice period;
- b) A summary of the Contractor's project activities and any sub-contractor project activities, that shall take place during the next invoice period;
- c) A list of outstanding items due to or from the City; and
- d) A status of the Project schedule.

1.11 The Contractor shall perform the work required under this Agreement pursuant to high quality industry standards expected by the City. The Contractor shall apply for and receive all appropriate permits before performing any work in the City. The Contractor shall also provide the appropriate permit drawings for Building Permits to be issued for the Project, if said permits are obligated by the Project. The City will assist the Contractor with obtaining the appropriate building and right-of-way permits.

1.12 The Contractor shall provide drawings of record, in the following 3 electronic formats for all locations where equipment has been installed and/or work has been performed. The electronic formats required by this Section 1.12 are Auto Cad Version 2007, ArcView and PDF.

1.13 Contractor recognizes that proper cleanup and removal of construction debris is an

important safety consideration. The Contractor shall be solely responsible for daily construction site/area cleanup and removal of all construction debris in accordance with City-approved disposal practices. Contractor shall be solely responsible for identifying and removing at its expense all hazardous material and waste which it uses and generates.

1.14 To the extent that there is any conflict between a provision specified in this Agreement, with a provision specified in any of the other Contract Documents, as defined in Section 1.15, this Agreement shall control. The City and the Contractor may amend this Section 1.14 as provided by Section 15 herein.

The Contractor acknowledges and agrees that the City has no retained control over any of the Work done pursuant to this Agreement, and that the City is expressly exempt from the retained control exception as defined in the Restatement of Torts, Second, Section 414. This provision shall survive completion, expiration, or termination of this Agreement.

1.15 The Contract Documents for this Project consist of:

- a) This Agreement;
- b) The City's RFP/RFQ, and the plans, specifications, general conditions, drawings addenda, and modifications thereto;
- c) The Contractor's response to the RFP/RFQ/Bid;
- d) Other exhibits and schedules, if any, listed in this Agreement;
- e) Amendments or Other Contract Documents, if any; and
- f) Amendments/Modifications to this Agreement issued after execution thereof.

1.16 As a condition of receiving payment, Contractor must (i) be in compliance with the Agreement, (ii) pay its employees prevailing wages when required by law (Examples of prevailing wage categories include public works, printing, janitorial, window washing, building and grounds services, site technician services, natural resource services, security guard and food services). Contractor is responsible for contacting the Illinois Dept. of Labor 217-782-6206; <http://www.illinois.gov/idol/Laws-Rules/CONMED/Pages/Rates.aspx> to ensure compliance with prevailing wage requirements), (iii) pay its suppliers and sub-contractors according to the terms of their respective contracts, and (iv) provide lien waivers to the City upon request.

2 Standard Certifications

Contractor acknowledges and agrees that compliance with this section and each subsection for the term of the Agreement is a material requirement and condition of this Agreement. By executing this Agreement, Contractor certifies compliance with this section and each subsection and is under a continuing obligation to remain in compliance and report any non-compliance.

This section, and each subsection, applies to sub-contractors used on this Agreement. Contractor shall include these Standard Certifications in any sub-contract used in the performance of the Agreement.

If this Agreement extends over multiple fiscal years, Contractor and its sub-contractors shall confirm compliance with this section in the manner and format determined by the City by the date specified by the City and in no event later than January 1 of each year that this Agreement remains in effect.

If the City determines that any certification in this section is not applicable to this Agreement, it may be stricken, subject to sole approval by the City, without affecting the remaining subsections.

2.1 As part of each certification, Contractor acknowledges and agrees that should Contractor or its sub-contractors provide false information, or fail to be or remain in compliance with the Standard Certification requirements, one or more of the following sanctions will apply:

- the Agreement may be void by operation of law,
- the City may void the Agreement, and
- Contractor and its sub-contractors may be subject to one or more of the following: suspension, debarment, denial of payment, civil fine, or criminal penalty.

2.2 By signing this Agreement, the Contractor certifies that it has not been barred from being awarded a contract with a unit of State or local Government as a result of bid rigging or bid rotating or similar offense, nor has it made any admission of guilt of such conduct that is a matter of public record. (720 ILCS 5/33 E-3, E-4).

2.3 In the event of the Contractor's noncompliance with any provision of Section 1-12-5 of the Evanston City Code, the Illinois Human Rights Act or any other applicable law, the Consultant may be declared non-responsible and therefore ineligible for future contracts or sub-contracts with the City, and the contract may be cancelled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulation.

2.4 During the term of this Agreement, the Contractor agrees as follows:

- a) That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, marital status, national origin or ancestry, or age or physical or mental disabilities that do not impair ability to work, and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization. Consultant shall comply with all requirements of City of Evanston Code Section 1-12-5.
- b) That, in all solicitations or advertisements for employees placed by it on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, sexual orientation, marital status, national origin, ancestry, or disability.

2.5 The Contractor certifies pursuant to the Illinois Human Rights Act (775 ILCS 5/2105 *et. seq.*), that it has a written sexual harassment policy that includes, at a minimum, the following

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information:

- a) The illegality of sexual harassment;
- b) The definition of sexual harassment under State law;
- c) A description of sexual harassment utilizing examples;
- d) The Contractor's internal complaint process including penalties;
- e) Legal recourse, investigation and complaint process available through the Illinois Department of Human Rights and the Human Rights Commission, and directions on how to contact both; and
- f) Protection against retaliation as provided to the Department of Human Rights.

2.6 In accordance with the Steel Products Procurement Act (30 ILCS 565), Contractor certifies steel products used or supplied in the performance of a contract for public works shall be manufactured or produced in the U.S. unless the City grants an exemption.

2.7 Contractor certifies that it is properly formed and existing legal entity and as applicable has obtained an assumed name certificate from the appropriate authority, or has registered to conduct business in Illinois and is in good standing with the Illinois Secretary of State.

2.8 If Contractor, or any officer, director, partner, or other managerial agent of Contractor, has been convicted of a felony under the Sarbanes-Oxley Act of 2002, or a Class 3 or Class 2 felony under the Illinois Securities Law of 1953, Contractor certifies at least five years have passed since the date of the conviction.

2.9 Contractor certifies that if more favorable terms are granted by Contractor to any similar governmental entity in any state in a contemporaneous agreement let under the same or similar financial terms and circumstances for comparable supplies or services, the more favorable terms will be applicable under this Agreement.

2.10 Contractor certifies that it is not delinquent in the payment of any fees, fines, damages, or debts to the City of Evanston.

2.11 The Contractor certifies that all Design Professionals performing the Work under this Agreement will ensure that the Project shall be designed in conformance with the Americans with Disabilities Act of 1990, 42 U.S.C. Section 12101, *et seq.*, and all regulations promulgated thereunder. Design Professional means any individual, sole proprietorship, firm, partnership, joint venture, corporation, professional corporation, or other entity that offers services under the Illinois Architecture Practice Act of 1989 (225 ILCS 305/), the Professional Engineering Practice Act of 1989 (225 ILCS 325/), the Structural Engineering Licensing Act of 1989 (225 ILCS 340/), or the Illinois Professional Land Surveyor Act of 1989 (225 ILCS 330/).

2.12 The Contractor shall comply with all federal, state and local laws, statutes, ordinances, rules, regulations, orders or other legal requirements now in force or which may be in force during the term of this Agreement. The Contractor shall comply with the Illinois Human Rights Act, 775 ILCS 5/1-101 *et. seq.*, Title VII of the Civil Rights Act of 1964, and the Illinois Prevailing

EXHIBIT N

3 Additional Services/Change Orders

3.1 If the representative of the City responsible for the Project verbally requests the Contractor to perform additional services, the Contractor shall confirm in writing that the services have been requested and that such services are additional services. Failure of the City to respond to the Contractor's confirmation of said services within thirty (30) calendar days of receipt of the notice shall be deemed a rejection of, and refusal to pay for the additional services. Contractor shall not perform any additional services until City has confirmed approval of said additional services in writing. If authorized in writing by the City, the Contractor shall furnish, or obtain from others, additional services of the following types, which shall be paid for by the City as set forth in Section 9 of this Agreement:

- a) Additional Services due to significant changes in scope of the Project or its design, including, but not limited to, changes in size, complexity or character of construction, or time delays for completion of work when such delays are beyond the control of the Contractor;
- b) Revisions of previously approved studies, reports, design documents, drawings or specifications;
- c) Preparation of detailed renderings, exhibits or scale models for the Project;
- d) Investigations involving detailed consideration of operations, maintenance and overhead expenses for the preparation of rate schedules, earnings and expense statements, feasibility studies, appraisals and valuations, detailed quantity surveys of material and labor, and material audits or inventories required for certification of force account construction performed by the City;
- e) Services not otherwise provided for in this Agreement.

3.2 The City may, upon written notice, and without invalidating this Agreement, require changes resulting in the revision or abandonment of work already performed by the Contractor, or require other elements of the work not originally contemplated and for which full compensation is not provided in any portion of this Agreement. Any additional services, abandonment of services which were authorized by the City, or changes in services directed by the City which result in the revision of the scope of services provided for in Exhibits A, B, C, and D that cause the total Compensation due Contractor under this Agreement to exceed \$25,000 or more, or increase or decrease the contract duration by more than 30 days are subject to approval by the Evanston City Council. These actions must be addressed either in a written Change Order or in a written amendment to this Agreement approved by both parties.

3.3 Contractor acknowledges and agrees that the Public Works Construction Change Order Act, 50 ILCS 525/1 *et seq.* shall apply to all Change Orders for the Project. It is expressly understood and agreed to by Contractor that it shall not be entitled to any damages or Compensation from the City on account of delay or suspension of all or any part of the Work. Contractor acknowledges that delays are inherent in construction projects and Contractor assessed that risk and fully included that risk assessment within its contract sum specified in its Response to the City Bid

22-07 for this Project. The City shall not compensate Contractor for work that is more difficult than the contract sum specified in its Response would reflect. Delays to minor portions of the Work will not be eligible for extensions of time.

Delays to the Project caused by labor disputes or strikes involving trades not directly related to the Project, or involving trades not affecting the Project as a whole will not be eligible for an extension of time.

The City will not grant an extension of time for a delay by the Contractor's inability to obtain materials unless the Contractor first furnishes to the City documentary proof. The proof must be provided in a timely manner in accordance with the sequence of the Contractor's operations and accepted construction schedule.

In addition to any other changes requested by City (as described in Sections 3.1 and 3.2), the Company shall be entitled to request (and the City may grant) Change Orders with respect to:

- (a) The City-caused delays;
- (b) Change in Law;
- (c) Force Majeure Events.

The foregoing events shall entitle the Contractor to a change in the Compensation for this Project, if the Contractor demonstrates that it will unavoidably incur reasonable costs as a result thereof and the Contractor provides reasonable and detailed documentary support with respect to any such price impact.

The parties agree to reasonably confer regarding any such disputes with respect to the issuance of a Change Order.

Any payment for compensable delay will only be based upon actual costs excluding, without limitation, what damages, if any, the Contractor may have reasonably avoided. The Contractor understands that this is the sole basis for recovering delay damages and explicitly waives any right to calculate daily damages for office overhead, profit, or other purported loss.

All Contractor Change Orders authorized under this Section 3 shall be made in writing. In remitting a Change Order, the Contractor must first show in writing that:

- (a) The work was outside the scope of this Agreement,
- (b) The extra work was not made necessary due to any fault of Contractor;
- (c) The circumstances said to necessitate the change in performance were not reasonably foreseeable at the time the Agreement was signed;
- (d) The change is germane to the original Agreement; and
- (e) The Change Order is in the best interest of the City and authorized by law.

Any person who fails to first obtain the City's written authorization for a Change Order commits a Class 4 felony. The written determination and the written Change Order resulting from

that determination shall be preserved in the contract's file which shall be open to the public for inspection.

The City reserves all rights and causes of action, at law or equity, to seek redress against entities or persons who violate the requirements of this Section 3. By initialing below, Contractor hereby acknowledges that it is bound by this Section 3.

Contractor's Initials: _____

3.4 The Contractor is required to include the City of Evanston as a reference whenever and wherever the Contractor provides references for similar projects for a period of one (1) year from the date of Final Acceptance by the City of the Work for this Project.

4 Bonds

4.1 Before the Scheduled Construction Commencement Date, the Contractor is required to furnish unconditional performance and payment bonds in the amount of 100% of the Compensation as security for the faithful performance and completion of all the Contractor's obligations under the Contract Documents and covering the payment of all materials used in the performance of this Agreement and for all labor and services performed under this Agreement. All Bonds shall be issued on a form acceptable to the City. The bonds must be for the entire term of the Agreement. Failure to provide these bonds shall constitute a breach of Contractor's obligations under this Agreement. Each surety providing the Bonds must have a Best's rating not less than A/X and be licensed in Illinois and shall be named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 as published in the Federal Register and available on the website of the U.S. Department of the Treasury, Financial Management Service, at www.fms.treas.gov/c570/c570.html. All Bonds signed by an agent must be accompanied by a certified copy of his or her authority to act. It shall be the duty of the Contractor to advise the surety or sureties of any Change Orders that result in an increase to the Compensation and to ensure that the amounts of the Bonds are updated to reflect and cover any such increases throughout the course of the Project. The cost of such Bonds shall be included within the Compensation.

4.2 If the surety behind any Bond furnished by the Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in the State or it ceases to meet any of the requirements of this Contract, the Contractor shall, within [5] five days thereafter, substitute another Bond of equivalent value and surety, both of which must be acceptable to the City. In addition, no further progress payments under the Agreement will be made by the City until the Contractor complies with the provisions of this Agreement. The Contractor shall furnish to the City proof of any required bonds and proof of required insurance as one of the conditions precedent to payment under the Agreement. Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment or performance of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or authorize a copy to be furnished. All surety Bonds provided for in this Section shall incorporate by reference this Agreement, and any language that may be in any such surety Bond which conflicts with the provisions of this Agreement that define the

scope of the surety('s) duty(ies) shall be of no force and effect.

5 Liquidated Damages in the Event Contractor Fails to Complete the Work

5.1 The parties agree that failure of Contractor to timely complete the Work required by this Agreement constitutes a default. The parties agree that this default will result in damage and injury to City. The parties further agree, however, that actual damages incurred by City as result of such default is difficult if not impossible to ascertain with any degree of certainty or accuracy. Accordingly, the parties have negotiated and have agreed that for each calendar day after written notice is delivered to Contractor and Contractor fails to cure such default, that Contractor will pay City, as and for liquidated damages, and not as a penalty, the sum of **FIVE HUNDRED DOLLARS** per day. Contractor shall reimburse the City for all costs, expenses and fees (including, without limitation, attorneys' fees), if any, paid by the City in connection with such written demand by City. Contractor stipulates and agrees that the sums payable by Contractor under this Section are reasonable under the circumstances existing as of the execution of this Agreement. This Section 5.1 is not intended to limit any direct damages that may be recoverable by City related to the Contractor's failure to complete the Work in accordance with this Agreement. There shall be no early completion bonus if the Work is completed before the substantial completion date. The City, at its option, may withhold liquidated damages from progress payments payable to Contractor before the substantial completion date.

6 The City's Responsibilities

6.1 The City may evaluate the Contractor's and any sub-contractor's performance (interim and final). Timeliness in meeting the Project schedule and the overall relationship with the Contractor are factors that will be considered in the Contractor's performance rating. An unfavorable performance rating may be a factor when future assignments are being considered.

6.2 The City makes no representation or warranty of any nature whatsoever as to the accuracy of information or documentation provided by the City to the Contractor which were generated or provided by third parties.

7 Period of Service

7.1 The Contractor shall commence work on the Project after supplying the City with the Contractor's performance and payment bonds and all required insurance documents before starting its Work on this Project. The City shall determine when the Contractor has completed the Work required pursuant to this Agreement, and shall determine the date of Final Acceptance. Contractor recognizes time is of the essence regarding its performance on this Project. Contractor shall continue to perform its obligations while any dispute concerning the Agreement is being resolved, unless otherwise directed by the City.

7.2 Each phase of the project shall be completed in accordance with the activities outlined in the City's **Bid 22-07**, Exhibit A. Project phases include:

7.2.1 Phase X: *[Phase name here.]*

7.2.2 Phase X: *[Phase name here.]*

7.2.3 Phase X: *[Phase name here.]*

8 Payment for Services and Reimbursements

8.1 Within the first five (5) business days of each month, the Contractor shall invoice the City for Work completed during the previous month. The Contractor shall provide a detailed invoice that relates invoiced items to the Contractor's response to **Bid 22-07** in both quantity and unit cost. Any discrepancies in the monthly invoice shall be promptly brought to the attention of the Contractor by the City Project Manager and efforts shall be made to promptly resolve said discrepancies between the City and Contractor. In the event the City and Contractor cannot resolve invoice discrepancies, items in dispute will be removed from the invoice and the City shall approve the remainder of the invoice. Payment will be made as soon as possible following the City Council meeting in which the item appeared on the bills list, and in accordance with all applicable laws and rules of the City of Evanston and the State of Illinois.

8.2 In the event of termination by the City of this Agreement pursuant to paragraph 9.1 after completion of any phase of the basic services, fees due the Contractor for services rendered through such phase shall constitute final payment for such services, and no further fees shall be due to the Contractor. In the event of such termination by the City during any phase of the basic services, the Contractor shall be paid for services rendered on the basis of the proportion of work completed on the phase to date of termination.

8.3 The City shall have the right to withhold payment to the Contractor due to the quality of a portion or all of the work performed hereunder which is not in accordance with the requirements of this Agreement, or which is unsatisfactory, or is due to the Contractor's failure or refusal to perform any of its obligations hereunder. Compensation in excess of the total contract amount specified in this Agreement will not be allowed unless justified in the City's sole judgment and authorized in advance as provided for in Section 3 of this Agreement. Compensation for improper performance by the Contractor is disallowed.

8.4 Upon completion of the Work performed by the Contractor, prior to the submission of a request for final payment, the City and Contractor shall perform a final acceptance test and review of the Work performed and/or equipment installed pursuant to the Agreement. A punch list of items outstanding will be jointly developed by the City and Contractor. In addition, the Contractor shall submit drawings of record for the Project for the City to approve. The Contractor shall promptly resolve all punch list items to the satisfaction of the City, and shall transmit to the City in writing confirmation that all punch list items have been resolved. The City will review, and the Contractor shall modify, as necessary, any drawings of record to the satisfaction of the City. Punch list items and drawings of record must be approved by the City prior to the Contractor submitting its final invoice for payment.

8.5 The Contractor shall submit an Affidavit and a final waiver of its lien, and all final waivers of liens of any sub-contractors, suppliers, and sub-sub-contractors, if applicable, with its final invoice, stating that all obligations incurred in performance of the professional services have been paid in full. The Affidavit will also include a statement stating that the professional services were performed in compliance with the terms of the Agreement. The Affidavit and all final lien waivers shall be on a form acceptable to the City.

8.6 All Project invoices shall be sent to:

Evanston Public Library
Attn: John Devaney
1703 Orrington
Evanston, Illinois 60201

9 Notice and Cure/Termination

9.1 In furtherance of Contractor's Work on this Project, the City and the Contractor agree that the following Notice and Cure provision in this Section 9.1 shall apply during the duration of Contractor's work on this Project, in addition to the reserved rights of the City enumerated in this Agreement as follows:

- 5.1 Liquidated Damages;
- 8.3 City's right to withhold payment;
- 16.2 Contractor's duty to revise and correct errors; and
- 16.3 Contractor's duty to respond to City's notice of errors and omissions.

The City may notify Contractor of its intent to terminate this Agreement within (7) seven calendar days of issuance by the City of written notice to Contractor's Project Manager regarding defects in the Project or in Contractor's Work. The City shall specify any such nonconforming Work or defects in the Project in its notice to Contractor under this Section 9.1. Contractor will have the opportunity to cure the non-conforming Work within (7) seven calendar days after receipt of the written notice issued by the City. All such curative work done shall be performed and completed to the City's satisfaction. Nothing in this Section 9.1 shall otherwise affect the City's right to exercise its rights in Section 9.2.

9.2 The City shall have the right to terminate this Agreement upon fifteen (15) days written notice for any reason. Mailing of such notice shall be equivalent to personal notice and shall be deemed to have been given at the time of receipt.

Payments made by the City pursuant to this Agreement are subject to sufficient appropriations made by the City of Evanston City Council. In the event of termination resulting from non-appropriation or insufficient appropriation by the City Council, the City's obligations hereunder shall cease and there shall be no penalty or further payment required.

9.3 Within thirty (30) days of termination of this Agreement, the Contractor shall turn over to the City any documents, drafts, and materials, including but not limited to, outstanding work product, data, studies, test results, source documents, AutoCAD Version 2007, ArcView, PDF, Word, Excel spreadsheets, technical specifications and calculations, and any other such items specifically identified by the City related to the Work herein. Upon receipt of said items, the Contractor shall be paid for labor and expenses incurred to the date of termination as provided in Section 8.2. This Agreement is subject to termination by either party if either party is restrained by a state or federal court of competent jurisdiction from performing the provisions of this Agreement. Upon such termination, the liabilities of the parties to this Agreement shall cease, but they shall not be relieved of the duty to perform their obligations through the date of termination. No lien shall be filed by the Contractor in the event of a termination of this Agreement by the City.

9.4 If, because of death or any other occurrence, including, but not limited to, Contractor becoming insolvent, it becomes impossible for any principal or principals of the Contractor to render the services set forth in this Agreement, neither the Contractor, nor its surviving principals shall be relieved of their obligations to complete the professional services. However, in the event of such an occurrence, the City at its own option may terminate this Agreement if it is not furnished evidence that competent professional services can still be furnished as scheduled.

9.5 In the event of an emergency or threat to the life, safety or welfare of the citizens of the City, the City shall have the right to terminate this Agreement without prior written notice.

10 Insurance

10.1 The Contractor shall, at its own expense, secure and maintain in effect throughout the duration of this contract, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work hereunder by the Contractor, its agents, representatives, employees or sub-contractors. Contractor acknowledges and agrees that if it fails to comply with all requirements of this Section 10, the City may void the Agreement.

The Contractor must give to the City Certificates of Insurance identifying the City to be an Additional Insured for all Work done pursuant to this Agreement before City staff recommends award of the contract to City Council. Any limitations or modifications on the Certificate(s) of Insurance issued to the City in compliance with this Section that conflict with the provisions of this Section 10 shall have no force and effect.

After award of the Contract to Contractor (contracts over \$500,000 in value or if the project is deemed high risk) the Contractor **shall** give the City a certified copy (ies) of the insurance policy (ies) evidencing the amounts set forth in Section 10.2, and copies of the Additional Insured endorsement to such policy (ies) which name the City as an Additional Insured for all Work done pursuant to this Agreement before Contractor does any Work pursuant to this Agreement. Contractor's certificate of insurance shall contain a provision that the coverage afforded under the policy(s) will not be canceled or reduced without thirty (30) days prior written notice (hand delivered or registered mail) to the City. Contractor shall promptly forward new certificate(s) of insurance

evidencing the coverage(s) required herein upon annual renewal of the subject policies.

The policies and the Additional Insured endorsement must be delivered to the City within two (2) weeks of the request. All insurance policies shall be written with insurance companies licensed or authorized to do business in the State of Illinois and having a rating of not less than A-VII according to the A.M. Best Company. Should any of the insurance policies be canceled before the expiration date, the issuing company will mail thirty (30) days written notice to the City. The Contractor shall require and verify that all sub-contractors maintain insurance meeting all of the requirements stated herein.

Any deductibles or self-insured retentions must be declared to and approved by the City. At the option of the City, either the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the City, its officers, officials, employees and volunteers; or the Contractor shall provide a financial guarantee satisfactory to the City guaranteeing payment of losses and related investigations, claim administration and defense expenses.

10.2 Contractor shall carry and maintain at its own cost with such companies as are reasonably acceptable to City all necessary liability insurance (which shall include as a minimum the requirements set forth below) during the term of this Agreement, for damages caused or contributed to by Contractor, and insuring Contractor against claims which may arise out of or result from Contractor's performance or failure to perform the Services hereunder:

- a) Worker's compensation in statutory limits and employer's liability insurance in the amount of at least five hundred thousand dollars (\$500,000);
- b) Comprehensive general liability coverage which designates the City as an additional insured for not less than three million dollars (\$3,000,000) combined single limit for bodily injury, death and property damage, per occurrence;
- c) Comprehensive automobile liability insurance covering owned, non-owned, and leased vehicles for not less than one million dollars (\$1,000,000) combined single limit for bodily injury, death, or property damage, per occurrence; and

Contractor understands that the acceptance of Certificates of Insurance, policies, and any other documents by the City in no way releases the Contractor and its sub-contractors from the requirements set forth herein.

Contractor expressly agrees to waive its rights, benefits and entitlements under the "Other Insurance" clause of its commercial general liability insurance policy as respects the City. Contractor expressly agrees that its insurance coverage is required to be primary by this Agreement, that its insurance coverage shall be on a primary and non-contributory basis, and that it and its insurance carrier are estopped from denying such coverage is primary. In the event Contractor fails to purchase or procure insurance as required above, the parties expressly agree that Contractor shall be in default under this Agreement, and that the City may recover all losses, attorney's fees and costs expended in pursuing a remedy, or reimbursement, at law or in equity, against Contractor.

11 Indemnification

11.1 The Contractor shall defend, indemnify and hold harmless the City and its officers, elected and appointed officials, agents, and employees from any and all liability, losses, or damages as a result of claims, demands, suits, actions, or proceedings of any kind or nature, including but not limited to costs, and fees, including attorney's fees, judgments or settlements, resulting from or arising out of any negligent or willful act or omission on the part of the Contractor or Contractor's sub-contractors, employees, agents or sub-contractors during the performance of this Agreement. Such indemnification shall not be limited by reason of the enumeration of any insurance coverage herein provided. This provision shall survive completion, expiration, or termination of this Agreement.

11.2 Nothing contained herein shall be construed as prohibiting the City, or its officers, agents, or employees, from defending through the selection and use of their own agents, attorneys, and experts, any claims, actions or suits brought against them. The Contractor shall be liable for the costs, fees, and expenses incurred in the defense of any such claims, actions, or suits. Nothing herein shall be construed as a limitation or waiver of defenses available to the City and employees and agents, including but not limited to the Illinois Local Governmental and Governmental Employees Tort Immunity Act, 745 ILCS 10/1-101 *et seq.*

At the City Corporation Counsel's option, Contractor must defend all suits brought upon all such Losses and must pay all costs and expenses incidental to them, but the City has the right, at its option, to participate, at its own cost, in the defense of any suit, without relieving Contractor of any of its obligations under this Agreement. Any settlement of any claim or suit related to this Project by Contractor must be made only with the prior written consent of the City Corporation Counsel, if the settlement requires any action on the part of the City.

To the extent permissible by law, Contractor waives any limits to the amount of its obligations to indemnify, defend, or contribute to any sums due under any Losses, including any claim by any employee of Contractor that may be subject to the Illinois Workers Compensation Act, 820 ILCS 305/1 *et seq.* or any other related law or judicial decision, including but not limited to, *Kotecki v. Cyclops Welding Corporation*, 146 Ill. 2d 155 (1991). The City, however, does not waive any limitations it may have on its liability under the Illinois Workers Compensation Act, the Illinois Pension Code or any other statute.

11.3 The Contractor shall be responsible for any losses and costs to repair or remedy work performed under this Agreement resulting from or arising out of any act or omission, neglect, or misconduct in the performance of its Work or its sub-contractors' work. Acceptance of the work by the City will not relieve the Contractor of the responsibility for subsequent correction of any such error, omissions and/or negligent acts or of its liability for loss or damage resulting therefrom.

11.4 All provisions of this Section 11 shall survive completion, expiration, or termination of this Agreement.

12 Drawings and Documents

12.1 Any drawings, survey data, reports, studies, specifications, estimates, maps, plans, computations, and other documents required to be prepared by the Contractor for the Project shall be considered Works for Hire and the sole property of the City.

12.2 The Contractor and its sub-contractor shall maintain for a minimum of three (3) years after the completion of this Agreement, or for three (3) years after the termination of this Agreement, whichever comes later, adequate books, records and supporting documents to verify the amounts, recipients and uses of all disbursements of funds passing in conjunction with the Agreement. The Agreement and all books, records and supporting documents related to the Agreement shall be available for review and audit by the City and the federal funding entity, if applicable, and the Contractor agrees to cooperate fully with any audit conducted by the City and to provide full access to all materials. Failure to maintain the books, records and supporting documents required by this Subsection shall establish a presumption in favor of the City for recovery of any funds paid by the City under the Agreement for which adequate books, records, and supporting documentation are not available to support their purported disbursement.

13 Successors and Assigns

13.1 The City and the Contractor each bind themselves and their partners, successors, executors, administrators, and assigns to the other party of the Agreement and to the partners, successors, executors, administrators, and assigns of such other party in respect to all covenants of this Agreement. Neither the City nor the Contractor shall assign, sublet, or transfer its interest in this Agreement without the written consent of the other. Nothing herein shall be construed as creating any personal liability on the part of any officer or agent of any public body, which may be a party hereto, nor shall it be construed as giving any right or benefits hereunder to anyone other than the City and the Contractor.

14 Force Majeure

14.1 Whenever a period of time is provided for in this Agreement for the Contractor or the City to do or perform any act or obligation, neither party shall be liable for any delays or inability to perform if such delay is due to a cause beyond its control and without its fault or negligence including, without limitation:

- a) Acts of nature;
- b) Acts or failure to act on the part of any governmental authority other than the City or Contractor, including, but not limited to, enactment of laws, rules, regulations, codes or ordinances subsequent to the date of this Agreement;
- c) Acts of war;
- d) Acts of civil or military authority;
- e) Embargoes;
- f) Work stoppages, strikes, lockouts, or labor disputes;
- g) Public disorders, civil violence, or disobedience;
- h) Riots, blockades, sabotage, insurrection, or rebellion;

- i) Epidemics or pandemics;
- j) Terrorist acts;
- k) Fires or explosions;
- l) Nuclear accidents;
- m) Earthquakes, floods, hurricanes, tornadoes, or other similar calamities;
- n) Major environmental disturbances; or
- o) Vandalism.

If a delay is caused by any of the *force majeure* circumstances set forth above, the time period shall be extended for only the actual amount of time said party is so delayed. Further, either party claiming a delay due to an event of *force majeure* shall give the other party written notice of such event within three (3) business days of its occurrence or it shall be deemed to be waived.

15 Amendments and Modifications

15.1 Except as otherwise provided herein, the nature and scope of Work specified in this Agreement may only be modified by a written Change Order, or a written amendment to this Agreement, approved by both parties. This Agreement may be modified or amended from time to time provided, however, that no such amendment or modifications shall be effective unless reduced to writing and duly authorized and signed by the authorized representatives of the parties.

16 Standard of Care & Warranty

16.1 The Contractor shall perform all of the provisions of this Agreement to the satisfaction of the City. The City shall base its determination of the Contractor's fulfillment of the scope of the work in accordance with generally accepted professional standards applicable to the Work for this Project. The Contractor shall perform all of the provisions of this Agreement with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar conditions.

16.2 The Contractor shall be responsible for the accuracy of its professional services under this Agreement and shall promptly make revisions or corrections resulting from its errors, omissions, or negligent acts without additional compensation. The City's acceptance of any of the Contractor's professional services shall not relieve the Contractor of its responsibility to subsequently correct any such errors or omissions. If a Contractor has provided the City with specifications for this Project which are determined to be incorrect or which require revision during the solicitation process (including but not limited to Requests for Proposals, Requests for Qualifications, or bids), the Contractor shall make such corrections or revisions to the specifications at no cost to the City. Further, upon receipt of an invoice from the City, the Contractor shall promptly reimburse the City for the reasonable costs associated with the preparation and dissemination of said corrections or revisions to appropriate parties, including but not limited to preparation of the corrected or revised documents, and printing and distribution costs.

16.3 During the pendency of its Work on this Project, the Contractor shall respond to the

City's notice of any errors or omissions within twenty-four (24) hours. The Contractor shall be required to promptly visit the Project site(s) if directed to by the City.

16.4 The Contractor shall comply with all federal, state, and local statutes, regulations, rules, ordinances, judicial decisions, and administrative rulings applicable to its performance under this Agreement.

16.5 Contractor guarantees and warrants to the City that:

- a) All materials and equipment furnished under this Agreement shall be of good quality and new, unless otherwise required or permitted by the Contract Documents;
- b) The Work of this Agreement shall be free from defects which are not inherent in the quality required; and
- c) The Work shall comply with the requirements set forth in the Contract Documents.

This warranty and guarantee shall be for a period of one (1) year from the date of completion and Final Acceptance of the Work by the City, or as otherwise provided in the Contract Documents.

If, within the one year warranty period, after the Contractor has received a final payment under this Agreement, any of the Work is found to be not be in accordance with the requirements of this Agreement, or where defects in materials or workmanship may appear, or be in need of repair, the Contractor shall correct non-conforming and/or defective work or materials promptly after receipt of written notice from the City. Contractor shall immediately at its own expense repair, replace, restore, or rebuild any such Work. This remedy is in addition to any other legal or equitable remedies the City may have under this Agreement or the law.

This guarantee and warranty shall not relieve Contractor of liability for latent defects, and shall be in addition to the City's rights under the law or other guarantees or warranties, express or implied.

16.6 The provisions of this Section 16 shall survive the completion, expiration or termination of this Agreement.

17 Savings Clause

17.1 If any provision of this Agreement, or the application of such provision, shall be rendered or declared invalid by a court of competent jurisdiction, or by reason of its requiring any steps, actions, or results, the remaining parts or portions of this Agreement shall remain in full force and effect.

18 Non-Waiver of Rights

18.1 No failure or delay by the City to exercise any power given to it hereunder or to insist upon strict compliance by Contractor with its obligations hereunder, nor any payment made by the City under this Agreement, shall constitute a waiver of the City's right to demand strict compliance

with the terms hereof, unless such waiver is in writing and signed by the City.

19 Entire Agreement

19.1 This Agreement sets forth all the covenants, conditions and promises between the parties with regard to the subject matter set forth herein. There are no covenants, promises, agreements, conditions or understandings between the parties, either oral or written, other than those contained in this Agreement. This Agreement has been negotiated and entered into by each party with the opportunity to consult with its counsel regarding the terms therein. No portion of the Agreement shall be construed against a party due to the fact that one party drafted that particular portion as the rule of *contra proferentem* shall not apply.

20 Governing Law

20.1 This Agreement shall be construed in accordance with and subject to the laws and rules of the City of Evanston and the State of Illinois both as to interpretation and performance. Venue for any action arising out of or due to this Agreement shall be in Cook County, Illinois. The City shall not enter into binding arbitration to resolve any dispute related to this Agreement. The City does not waive tort immunity by entering into this Agreement.

21 Ownership of Contract Documents

21.1 Contractor is specifically prohibited from using in any form or medium, the name or logo of the City for public advertisement, unless expressly granted written permission by the City. Submission or distribution of documents to meet official regulatory requirements or for similar purposes in connection with this Project is not to be construed as publication in derogation of the City's reserved rights.

22 Notice

22.1 Any notice required to be given by this Agreement shall be deemed sufficient if made in writing and sent by certified mail, return receipt requested, or by personal service, to the persons and addresses indicated below or to such other addresses as either party hereto shall notify the other party of in writing pursuant to the provisions of this Subsection:

Evanston Public Library - Project Manager John Devaney, **Bid 22-07**
1703 Orrington Avenue
Evanston, Illinois 60201

if to the Contractor:

22.2 Mailing of such notice as and when provided above shall be equivalent to personal

EXHIBIT N

notice and shall be deemed to have been given at the time of mailing.

23 Severability

23.1 Except as otherwise provided herein, the invalidity or unenforceability of any particular provision, or part thereof, of this Agreement shall not affect the other provisions, and this Agreement shall continue in all respects as if such invalid or unenforceable provision had not been contained herein.

24 Execution of Agreement

24.1 This Agreement shall be signed last by the City Manager.

25 Counterparts

25.1 For convenience, this Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original.

26 Authorizations

26.1 The Contractor's authorized representatives who have executed this Agreement warrant that they have been lawfully authorized by the Contractor's board of directors or its bylaws to execute this Agreement on its behalf. The City Manager affirms that he/she has been lawfully authorized to execute this Agreement. The Contractor and the City shall deliver upon request to each other copies of all articles of incorporation, bylaws, resolutions, ordinances, or other documents which evidence their legal authority to execute this Agreement on behalf of their respective parties.

27 Time of Essence

27.1 Time is of the essence with respect to each provision hereof in which time is a factor.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be signed by their duly authorized representatives. The effective date of this Agreement will be the date this Agreement is signed by the City Manager.

CONTRACTOR

By: _____

Name: _____

Its: _____

Date: _____

CITY OF EVANSTON

By: _____

Kelley A. Gandurski

Its: Interim City Manager

Date: _____

Approved as to form:

By: _____

Nicholas E. Cummings

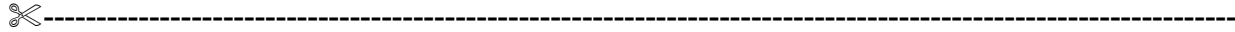
Its: Corporation Counsel

Revision: April 2021

EXHIBIT O

BID BOND SUBMITTAL LABEL

CUT AND ATTACH LABEL ON OUTSIDE OF SEALED BID BOND SUBMITTAL



BID SUBMITTAL NUMBER: _____

BID SUBMITTAL NAME: _____

BID SUBMITTAL DUE DATE/TIME: _____

COMPANY NAME: _____

COMPANY ADDRESS: _____

COMPANY TELEPHONE #: _____



If required by the bid documents, a scanned copy of the bid bond must be included with the bid electronic submission. The City is currently not able to accept a certified check, bank cashier's check or electronic bid bond at this time.

The original bid bond (in the amount of 5% of the original bid amount) must be mailed within ten (10) days after the bid due date, to the City of Evanston Purchasing Department, 2100 Ridge Avenue - Room 4200 Evanston, Illinois 60201 Attention Purchasing Manager using the USPS (certified or priority), UPS or FedEx mail options in order to have a tracking number; which sum shall be forfeited in case the successful bidder fails to enter into a binding contract and provide a properly executed contract and surety bond within 15 days after the date the contract is awarded by the City.

PROJECT MANUAL

**Evanston Public Library
Ventilation Fan Upgrade
Bid 22-07**

City of Evanston
Evanston, IL

PROJECT MANUAL CONTENTS

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- SECTION 01 3101 MECHANICAL AND ELECTRICAL COORDINATION
- SECTION 01 3102 ALTERATION PROJECT PROCEDURES
- SECTION 01 3103 STARTING OF SYSTEMS
- SECTION 01 3300 SUBMITTALS
- SECTION 01 4000 QUALITY CONTROL SERVICES
- SECTION 01 7329 CUTTING AND PATCHING
- SECTION 01 7700 PROJECT CLOSEOUT

DIVISION 20 - COMMON REQUIREMENTS FOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION

- SECTION 20 0500 BASIC REQUIREMENTS FOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION
- SECTION 20 0501 MINOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION DEMOLITION
- SECTION 20 0513 MOTOR REQUIREMENTS FOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION EQUIPMENT
- SECTION 20 0553 IDENTIFICATION FOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION SYSTEMS
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- SECTION 23 0100 COMMON WORK REQUIREMENTS FOR MECHANICAL
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- SECTION 23 0903 TEMPERATURE CONTROL CONDUIT
- SECTION 23 0904 TEMPERATURE CONTROL WIRING
- SECTION 23 0906 TEMPERATURE CONTROL DEMOLITION
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DIVISION 26 - ELECTRICAL

SEE ELECTRICAL DRAWINGS

DRAWINGS (BOUND SEPARATELY)

CS COVER SHEET

M001 MECHANICAL SYMBOLS AND ABBREVIATIONS

M002 MECHANICAL SCHEDULES

MD100 MECHANICAL PLAN - DEMOLITION

M100 MECHANICAL PLAN - NEW WORK

M200 TEMPERATURE CONTROLS

E001 ELECTRICAL SYMBOLS AND SPECIFICATIONS

E002 ELECTRICAL DETAILS, SCHEDULES AND DIAGRAMS

ED100 ELECTRICAL PLAN - DEMOLITION

E100 ELECTRICAL PLAN - NEW WORK

END OF SECTION

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SPECIFICATIONS

DIVISION 01 - GENERAL REQUIREMENTS

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**SECTION 01 1100
SUMMARY OF WORK**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Scope of work
- B. Contractor use of site and premises
- C. Work sequence
- D. Owner occupancy and utilization

1.2 SCOPE OF WORK

- A. See drawings.

1.3 CONTRACTOR USE OF SITE AND PREMISES

- A. Limit use of site and premises to allow:
 - 1. Owner occupancy.
 - 2. Use of premises by Owner to conduct normal activities.
- B. Tie-ins to existing systems must be done in a manner so as to minimize interference with Owner's operations (i.e., during premium time).
 - 1. Use of site

1.4 WORK SEQUENCE

- A. Install work in phases to accommodate Owner's occupancy requirements during the construction period. Coordinate mechanical or electrical schedule and operations with Owner/Engineer:
 - 1. Phased temporary fan operation as specified in drawings.

1.5 OWNER OCCUPANCY AND UTILIZATION

- A. Owner will occupy the site during the entire period of construction for the conduct of normal operations.
- B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- C. Schedule the Work to accommodate this requirement.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

END OF SECTION

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**SECTION 01 2300
ALTERNATES**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Submission procedures
- B. Documentation of changes to Contract Sum/Price and Contract Time
- C. Requirements
- D. Selection and Award of Alternates
- E. Schedule of Alternates

1.2 REQUIREMENTS

- A. Submit Alternates with full description of the proposed Alternate and the effect on adjacent or related components.
- B. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner Contractor Agreement.
- C. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.3 SELECTION AND AWARD OF ALTERNATIVES

- A. Indicate variation of Bid Price for Alternates described below and list in Bid Form Document or any supplement to it, which requests a 'difference' in Bid Price by adding to or deducting from the base bid price.
- B. Bid may be evaluated on base bid price. After determination of preferred bidder, consideration will be given to Alternates and Bid Price adjustments.

1.4 SCHEDULE OF ALTERNATES

- A. Alternate 1: MCC Upgrade
 - 1. Replace Motor Control Center with New Panelboard
 - 2. Provide and install two VFD control panels each controlling four fans in lieu of single VFD control panel for all eight fans.

PART 2 - PART 2 - PRODUCTS

Not Applicable

PART 3 - PART 3 - EXECUTION

Not Applicable

END OF SECTION

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**SECTION 01 3101
MECHANICAL AND ELECTRICAL COORDINATION**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Mechanical and Electrical Coordination
- B. Submittals
- C. Coordination required
- D. Coordination documents
- E. Coordination of submittals
- F. Coordination of substitutions and modifications
- G. Observation of Work
- H. Documentation
- I. Equipment start up
- J. Inspection and acceptance of equipment

1.2 MECHANICAL AND ELECTRICAL WORK COORDINATION

- A. Provide coordination for the type of mechanical and electrical work required for this Project for the duration of the Work.

1.3 SUBMITTALS

- A. Submit name, address and telephone number of Coordinator and name of principal officer to Owner for approval.
- B. Submit any coordination documents prior to submitting shop drawings, product data and samples.

1.4 COORDINATION REQUIRED

- A. Coordinate mechanical and electrical work of Divisions 20, 21, 22, 23, and 26, with work of each other and of other Divisions.
- B. Coordinate progress schedules, including dates for submittals and for delivery of products.
- C. Conduct conferences among Subcontractors and others concerned with the Work to establish and maintain coordination and schedules and to resolve coordination matters in dispute.
- D. Confer with other Contractors regarding location and size of pipes, equipment, fixtures, conduit, ducts, openings, switches, outlets, fire sprinkler heads, fire hose cabinets, etc., in progress of the work of any Contractor project. Architectural Drawings shall take precedence over Mechanical and Electrical Drawings.
- E. Where work connects to that of another trade or to piping or equipment in place, make measurements in field to make connection work come true and line up with item being connected.
- F. Where work specified under other Divisions of Specifications connects to equipment which is part of Divisions 20, 21, 22, 23, and 26, provide proper connection(s) to such equipment.

- G. Participate in progress meetings. Report on progress of Work to be adjusted under coordination requirements and any required changes in schedules. Transmit minutes of meetings and reports to concerned parties.

1.5 COORDINATION DOCUMENTS

- A. Prepare coordination drawings to organize installation of Products for efficient use of available space, for proper sequence of installation and to identify potential conflicts.
- B. Prepare a master schedule to identify responsibilities under each section of Divisions 20, 21, 22, 23, 26, 27, and 28 of the Specifications for activities which directly relate to this work, including submittals and temporary services. Identify electrical power characteristics and control wiring required for each item of equipment.
- C. Maintain documents for the duration of the Work, recording changes due to site instructions, modifications or adjustments.
- D. After Engineer review original and revised documents, reproduce and distribute copies to concerned parties.

1.6 COORDINATION OF SUBMITTALS

- A. Review shop drawings, product data and samples for compliance with Contract Documents and for coordination among work of all sections of the Project Manual. Transmit to Contractor for review, then transmit to Engineer.
- B. Check field dimensions and clearances and relationship to available space and anchors.
- C. Check compatibility with equipment and Work of other sections, electrical characteristics and operational control requirements.
- D. Check motor voltages and control characteristics.
- E. Coordinate controls, interlocks, wiring of pneumatic switches and relays.
- F. Coordinate wiring and control diagrams.
- G. Review the effect of any changes on work of other sections.
- H. Verify and coordinate maintenance of Record Documents.

1.7 COORDINATION OF SUBSTITUTIONS AND MODIFICATIONS

- A. Review proposals and requests from subcontractors.
- B. Verify compliance with Contract Documents and for compatibility with Work and Products of other sections.
- C. Submit to Owner/Engineer with recommendation for action.

1.8 OBSERVATION OF WORK

- A. Observe Work for compliance with Contract Documents.
- B. Maintain a list of observed deficiencies and defects; promptly submit to Engineer.

1.9 DOCUMENTATION

- A. Observe and maintain a record of tests. Record:
 - 1. Specification section number, product and name of Subcontractor
 - 2. Name of testing agency and name of inspector.
 - 3. Name of manufacturer's representative present.
 - 4. Date, time and duration of tests.
 - 5. Type of test and results.
 - 6. Retesting required.
- B. Assemble background documentation for dispute and claim settlement by Engineer.
- C. Submit copies of documentation to Engineer upon request.

1.10 EQUIPMENT START UP

- A. Verify utilities, connections and controls are complete and equipment is in operable condition as required by Division 01 Section 01 3103, "Starting of Systems."
- B. Observe start-up and adjustments; record time and date of start up and results.
- C. Observe equipment demonstrations to Owner; record times and additional information required for Operation and Maintenance Manuals.

1.11 INSPECTION AND ACCEPTANCE OF EQUIPMENT

- A. Prior to inspection, verify that equipment is tested and operational and clean.
- B. Assist Engineer with inspection. Prepare list of items to be completed and corrected.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

END OF SECTION

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**SECTION 01 3102
ALTERATION PROJECT PROCEDURES**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Demolition, alterations, cutting and protection
- B. Products and installation for patching and extending Work
- C. Transition and adjustments
- D. Repair of damaged surfaces, finishes and cleaning

1.2 SEQUENCE AND SCHEDULES

- A. Schedule work in sequences and within times specified in Division 01 Section 01 0000, "Summary of Work."
- B. Submit separate detailed sub-schedule for alterations work, coordinated with Master Construction Schedule. Show:
 - 1. Each stage of work; occupancy dates of areas
 - 2. Date of Substantial Completion for each area of alteration work
 - 3. Crafts and subcontractors employed in each stage
- C. Schedule noisy or hazardous work to avoid problems with Owner's operations.

1.3 DEMOLITION, ALTERATIONS, CUTTING AND PROTECTION

- A. Assign demolition, moving, removal, cutting and patching work to crafts qualified to perform work in manner to cause least damage to each type of work and provide means of restoring surfaces to appearance of new work.
- B. Perform cutting and removal work to remove minimum necessary and in manner to avoid damage to adjacent work.
 - 1. Cut finish surfaces such as masonry, tile, plaster or metals by methods to terminate surfaces in straight line at natural point of division.
- C. Perform cutting and patching as specified in Division 01 Section 01 7329, "Cutting and Patching."
- D. Protect existing finishes, equipment and adjacent work which are scheduled to remain from damage.
 - 1. Protect existing and new work from weather and temperature extremes.
 - a. Maintain existing interior work above 60°F.
 - b. Provide weather protection, waterproofing, heat and humidity control to prevent damage to remaining existing work and to new work.
- E. Provide temporary enclosures to separate work areas from existing building and from areas occupied by Owner and to provide weather protection.

PART 2 - PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. Ensure that work is complete.
- B. Provide same materials or types of construction as that in existing structure, to patch, extend or match existing work.
 - 1. Contract Documents may not define products or standards of workmanship present in existing construction.
 - 2. Determine products by inspection and testing.
 - 3. Determine workmanship by use of existing as sample of comparison.
- C. Presence of a product, finish or type of construction requires that patching, extending or matching be performed to make work complete and consistent to identical quality standards.

PART 3 - EXECUTION

3.1 EXAMINATION (PRE-DEMOLITION)

- A. Verify if all hazardous waste materials (asbestos, PCB/transformers, etc.) have been removed from work areas. If this is not verified, notify Owner/Engineer in writing.
- B. Demolition Drawings are based on casual field observation. Review site conditions and report discrepancies to Engineer before disturbing existing installation.
- C. Beginning of demolition work means acceptance of existing conditions.

3.2 PERFORMANCE

- A. Patch and extend existing work using skilled craftsmen capable of matching existing quality of workmanship. For patched or extended work, provide quality equal to that specified for new work.

3.3 PREPARATION

- A. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.
- B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals and deteriorated masonry and concrete. Replace materials as specified for finished Work.
- C. If, during course of project, hazardous materials are in any way suspected, including but not limited to asbestos, pollutants, or PCB, inform Owner immediately and suspend action on that portion of work.
- D. Remove or repair dangerous or unsanitary conditions.
- E. Remove debris and abandoned items from area and from concealed spaces.
- F. Remove abandoned piping, conduit and wiring.
- G. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.
- H. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.

3.4 EXAMINATION (PRE-INSTALLATION)

- A. Verify that demolition is complete and areas are ready for installation of new Work.
- B. Beginning of restoration Work means acceptance of existing conditions.

3.5 INSTALLATION

- A. Coordinate work of alterations and renovations to expedite completion to accommodate Owner occupancy.
- B. Remove, cut and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original condition.
- C. In addition to specified replacement of equipment restore existing BAS, Fire Protection, and Electrical systems to full operational condition.
- D. Install Products as specified in individual Sections of Divisions 20, 21, 22, 23, and 26.

3.6 TRANSITIONS

- A. Where new Work abuts or aligns with existing, perform a smooth and even transition. Patched Work to match existing adjacent Work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Engineer.

3.7 FINISHES

- A. Finish patches to product uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.8 CLEANING

- A. Perform construction cleaning as specified in Division 01 Section 01 7700, "Project Closeout."
 - 1. Clean Owner-occupied areas daily.
 - 2. Clean all spillage, overspray and heavy dust collections in Owner occupied areas immediately.
- B. At completion of work of each craft, clean area and make surfaces ready for work of successive crafts.
- C. At completion of alterations work in each area, provide final cleaning in accord with Section 01700 and return space to a condition suitable for use of Owner.

END OF SECTION

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**SECTION 01 3103
STARTING OF SYSTEMS**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Starting systems
- B. Demonstration and instructions
- C. Testing, adjusting, and balancing

1.2 STARTING SYSTEMS

- A. Coordinate schedule for startup of various equipment and systems.
- B. Notify Engineer seven calendar days prior to start up each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.
- D. Verify that tests, meter readings and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Verify utilities, connections and controls are complete and equipment is in operable condition.
- G. Observe start-up and adjustments: Record time and date of start-up and results.
- H. Observe equipment demonstrations to Owner: Record times and additional information required for Operation and Maintenance Manuals.
- I. Execute start up under supervision of responsible manufacturer's representative in accordance with manufacturers' instructions.

1.3 INSPECTION AND ACCEPTANCE OF EQUIPMENT

- A. Prior to inspection, verify that equipment is tested, operational and clean.
- B. Assist Engineer with inspection. Prepare list of items to be completed and corrected.

1.4 TESTING, ADJUSTING AND BALANCING

- A. Contractor shall hire TAB contractor of Owner's preference for half day of fan wall AFMS startup.
- B. The independent firm will perform services specified in Division 23 Section 23 0593, "Testing, Adjusting, and Balancing for HVAC," except for factory tests.
- C. Reports will be submitted by the independent firm to the Engineer indicating observations and results of tests and indicating compliance or non compliance with specified requirements and with the requirements of the Contract Documents.

1.5 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

END OF SECTION

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**SECTION 01 3300
SUBMITTALS**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Submittal procedures
- B. Proposed products list
- C. Contractor-prepared shop drawings
- D. Preventive maintenance (PM) tasks/schedule
- E. Product data
- F. Samples
- G. Manufacturers' instructions
- H. Manufacturers' certificates

1.2 SUBMITTAL PROCEDURES

- A. Refer also to provisions of the General Conditions.
- B. Identify Project, Contractor, Subcontractor or supplier; pertinent Drawing sheet, equipment tag, system designation number(s) and specification Section number, as appropriate.
- C. Where possible, submit shop drawings and product data grouped to include complete submittals of related systems, products and accessories in a single submittal so long as this does not delay individual items whose review is time-critical.
- D. If only part of required drawings in one group are submitted, action will be withheld on them until remaining drawings are submitted.
- E. Catalog cuts showing more than one model of a product shall be clearly marked indicating which model is being proposed.
- F. Capacity and performance data shall be given in same form, units and completeness presented in Contract Documents.
- G. Identifying symbols and tags used on drawings shall be clearly cross-referenced on shop drawings.
- H. Identify room names and numbers in which various products will be used.
- I. Mark in units to match those specified.
- J. Apply Contractor's stamp, signed or initialed, certifying that review, verification of Products required, field dimensions, adjacent construction Work and coordination of information is in accordance with the requirements of the Work and Contract Documents.
- K. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- L. Revise and resubmit submittals as required, identifying all changes made since previous submittal.
- M. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.3 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit estimated progress schedule in duplicate within 15 business days after date of Owner-Contractor Agreement for Engineer/Owner review.
- B. Revise and resubmit as required.
- C. Revise and resubmit work schedule affected by accepted alternates.

1.4 CONTRACTOR-PREPARED SHOP DRAWINGS

- A. Submit the number of hard copies as established at the preconstruction conference. Alternatively, shop drawings may be submitted electronically in .pdf format.
- B. Submit ¼" scale floor plans indicating proposed routing of new piping electrical and duct systems, new and relocated equipment locations and connection points to existing services including sections through equipment and piping diagrams of all connections.
- C. Identify equipment, pipe risers, duct risers, column lines, etc., with designations shown on Contract Documents.
- D. After review, distribute in accordance with Article on Procedures above and provide copies for Record Documents described in Division 01 Section 01 7700, "Project Closeout."

1.5 PRODUCT DATA

- A. Submit the number of hard copies as established at the preconstruction conference. Alternatively, shop drawings may be submitted electronically in .pdf format.
- B. Mark each copy to identify applicable products, models, systems, equipment tags and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- C. After review, distribute in accordance with Article on Procedures above and provide copies for Record Documents described in Division 01 Section 01 7700, "Project Closeout."

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

END OF SECTION

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**SECTION 01 4000
QUALITY CONTROL SERVICES**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance and control of installation
- B. References
- C. Manufacturers' field services and reports

1.2 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions and workmanship to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.
- E. Work to be performed by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.3 MANUFACTURERS' FIELD SERVICES, FIELD TESTS AND REPORTS

- A. When specified in individual specification Sections, Contractor shall require material or Product suppliers, Subcontractors, or manufacturers to provide qualified staff personnel to observe site conditions; testing; conditions of installation; quality of workmanship; start-up of equipment; testing, adjusting and balancing of equipment and materials; and troubleshooting as applicable B and to initiate instructions when necessary. Submit report per paragraph C below, this section.
- B. Report observations and site decisions or instructions given to Owner, applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Submit written report in duplicate within 10 days of observation, start-up, testing, etc. to Engineer for review.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

END OF SECTION

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CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Requirements and limitations for cutting and patching of Work.

1.2 SUBMITTALS

- A. Submit written request in advance of cutting or alteration which affects:
 - 1. Structural integrity of any element of Project
 - 2. Integrity of weather exposed or moisture resistant element
 - 3. Efficiency, maintenance, or safety of any operational element
 - 4. Visual qualities of sight exposed elements
 - 5. Work of Owner or separate contractor
- B. Include in request:
 - 1. Effect on work of Owner or separate contractor
 - 2. Written permission of affected separate contractor
 - 3. Identification of Project
 - 4. Location and description of affected work
 - 5. Necessity for cutting or alteration
 - 6. Description of proposed work and products to be used
 - 7. Alternatives to cutting and patching
 - 8. Effect on work of Owner or separate contractor
 - 9. Written permission of affected separate contractor
 - 10. Date and time work will be executed

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Primary Products: Those required for original installation.
- B. Product Substitution: For any proposed change in materials, submit request for substitution under provisions of Division 01 Section 01 6000, "Material and Equipment."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.
- B. After uncovering existing work, inspect conditions affecting performance of work.

- C. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

- A. Provide temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.
- B. Provide protection from elements for areas which may be exposed by uncovering work.
- C. Maintain excavations free of water.

3.3 CUTTING AND PATCHING

- A. Execute cutting, fitting and patching including excavation and fill to complete work.
- B. Fit products together, to integrate with other work.
- C. Uncover work to install ill-timed work.
- D. Remove and replace defective or non-conforming work.
- E. Remove samples of installed work for testing when requested.
- F. Provide openings in the work for penetration of mechanical and electrical work.

3.4 PERFORMANCE

- A. Execute work by methods to avoid damage to other Work and which will provide appropriate surfaces to receive patching and finishing.
- B. Employ original installer to perform cutting and patching for weather exposed and moisture resistant elements and sight exposed surfaces.
- C. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- D. Restore work with new products in accordance with requirements of Contract Documents.
- E. Fit work air tight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.
- F. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material [in accordance with [Division 20 Section 20 0517, "Penetrations for Mechanical, Plumbing, and Fire Suppression," to full thickness of the penetrated element.
- G. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

END OF SECTION

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**SECTION 01 7700
PROJECT CLOSEOUT**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Closeout procedures
- B. Final cleaning
- C. Adjusting
- D. Project record documents
- E. Operation and maintenance data
- F. Warranties
- G. Spare parts and maintenance materials

1.2 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected and that Work is complete in accordance with Contract Documents and ready for inspection by Engineer.
- B. Provide submittals to Engineer that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.3 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces.
- C. Clean equipment and fixtures to a sanitary condition.
- D. Clean debris from roofs, gutters, downspouts, and drainage systems.
- E. Clean site; sweep paved areas, rake clean landscaped surfaces affected by installation.
- F. Remove waste and surplus materials, rubbish and any construction facilities and equipment from the site.]

1.4 ADJUSTING

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.5 PROJECT RECORD DOCUMENTS

- A. Store Record Documents separate from documents used for construction.
- B. Record information concurrent with construction progress.

- C. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
 - 1. Manufacturer's name and product model and number
 - 2. Product substitutions or alternates utilized
 - 3. Changes made by Addenda and Modifications
- D. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Field changes of dimension and detail
 - 2. Details not on original Contract Drawings
- E. Submit changes to Record Documents in AutoCAD format.
- F. Delete Engineer title block and seal from all documents.
- G. Submit documents to Engineer with claim for final Application for Payment.

1.6 OPERATION AND MAINTENANCE DATA

- A. Quality Assurance
 - 1. Instructions and data are to be prepared by personnel experienced in maintenance and operation of described products.
- B. Electronic Files: Provide single bookmarked and compiled PDF on USB thumb drive or cloud-based download.
- C. Electronically subdivide the contents, logically organized as described below with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Contents: Prepare a Table of Contents, with each Product or System description identified.
- E. Part 1: Directory listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors and major equipment suppliers.
- F. Part 2: Operation and maintenance instructions, arranged by system and subdivided by component. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - 1. Significant design criteria.
 - 2. List of equipment.
 - 3. Parts list for each component.
 - 4. Operating instructions.
 - 5. Maintenance instructions for equipment and systems.
- G. Part 3: Project documents and certificates, including the following:
 - 1. Shop drawings and product data.
 - 2. Air and water balance reports.
 - 3. Certificates.
 - 4. Copies of warranties.

- H. Submit one draft of completed manual in final form 15 days prior to final inspection. This copy will be returned after final inspection with Engineer comments. Revise content of documents as required prior to final submittal.
- I. Submit final version revised within ten days after final inspection.

1.7 WARRANTIES

- A. Execute and assemble documents from Subcontractors, suppliers and manufacturers.
- B. Provide Table of Contents and assemble in 3-D side ring binder with durable cover. Email copy as part of project turnover documents.
- C. Submit prior to final Application for Payment.

1.8 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections.
- B. Deliver to Project site and place in location as directed.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

END OF SECTION

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SPECIFICATIONS

DIVISION 20 – COMMON REQUIREMENTS FOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION

- SECTION 20 0500 BASIC REQUIREMENTS FOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION
- SECTION 20 0501 MINOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION DEMOLITION
- SECTION 20 0513 MOTOR REQUIREMENTS FOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION EQUIPMENT
- SECTION 20 0553 IDENTIFICATION FOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION SYSTEMS
- SECTION 20 2923 VARIABLE FREQUENCY DRIVES FOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION

SECTION 20 0500
BASIC REQUIREMENTS FOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Basic mechanical requirements specifically applicable to Divisions 20, 21, 22, and 23.

1.2 DEFINITIONS

- A. The following words or phrases have special meaning when used in the article (of the division and in any other requirement) applicable to this discussion:
1. "Exposed to View" or "Exposed" — shall have reference to and mean that the pipes, ducts, etc., insulated or otherwise, in the completed structure are visible within any normally occupied space, room or area.
 2. "In Concealed Spaces", "Concealed" or "Not Exposed to View" — shall have reference to and mean that the pipes, duct, etc., insulated or otherwise are concealed and not exposed to view within furred spaces, above suspended ceilings, pipe chases, etc.
 3. "Unfinished Spaces" or "Unfinished Rooms" — shall have reference to areas such as Machine Rooms, Equipment Rooms, or similar areas. Where the words "In Finished Areas" or "Finished Rooms" are used, it shall have reference to rooms or spaces, such as, Reading rooms, Offices, Public Corridors, etc.
 4. "Finished Rooms or Spaces" shall refer to areas similar to offices, public corridors, and public toilet rooms.
 5. "Provide" — shall be taken to mean "furnish and install" meaning to purchase and deliver to the job site and the installation thereof.
 6. "Piping" — shall include, in addition to pipe all fittings, valves, hangers, and other supports, expansion compensators, anchors, and accessories related to such piping including associated insulation.
 7. "Ductwork" — shall include, in addition to ducts, all fittings, transitions, dampers, hangers and other supports, fire dampers, access panels, associated insulation and accessories related to such ductwork.
 8. "Contractor" in Specifications and Drawing refers to respective Contractor performing that portion of work.
 9. "Invert Elevation" (I.E.) means elevation of inside bottom of pipe or duct.
 10. "Mechanical Work" is work in Divisions 20, 21, 22, and 23.
 - a. NOTE: The words "Contractor shall" are implied and shall be so understood wherever the directions "furnish," "install" or "provide" are used.

1.3 SPECIAL CONDITIONS

- A. Minor items and accessories or devices reasonably inferable as necessary to the complete and proper operation of any system shall be provided by the Contractor for such system whether or not they are specifically called for by the Specifications or Drawings.

- B. Where work specified in other sections of the specifications connects to equipment specified in Divisions 20, 21, 22, and 23 Sections, check the required connection to such equipment.

1.4 WORK BY OWNER

- A. None

1.5 OWNER-FURNISHED PRODUCTS

- A. None

1.6 PROJECT/SITE CONDITIONS

- A. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Owner before proceeding.

1.7 CONTRACTORS' USE OF PREMISES

- A. Refer to Division 01.
- B. The Owner will be responsible for the identification and abatement of all hazardous materials and asbestos associated with the project. Although great care will be taken to eliminate any risks, the Contractor must be aware that hazardous materials may exist on site. Therefore, the Contractor shall immediately suspend work and notify the Owner if asbestos or other hazardous material is suspected in the work area of the project.

1.8 WORK SEQUENCE

- A. Install work in phases to accommodate Owner's occupancy requirements during the construction period. Coordinate mechanical schedule with other trades and other operations.
- B. Coordinate with the city which days where the AHU may operate at a reduced load. Avoid warm days and cold days.
- C. The City of Evanston Library will open every day and ventilation is required for all days where the facility is open.
- D. Partial ventilation is acceptable as needed.
- E. The fan array shall be installed such that half of the array is brought online one day to offer some ventilation, and the other half of the fan array is brought on the next day.
- F. A final construction schedule to be submitted to the owner and Engineer prior to the start of work.

1.9 FUTURE WORK

- A. Refer to Division 01.

1.10 SUMMARY OF PROJECT

- A. Refer to Division 01.

1.11 ALLOWANCES

- A. Refer to Division 01.

1.12 UNIT PRICES

A. Refer to Division 01.

1.13 ALTERNATES

A. Refer to Division 01.

1.14 REFERENCE STANDARDS

A. Refer to Division 01.

1.15 SUBMITTALS

A. Refer to Division 01.

1.16 PROPOSED PRODUCTS LIST

A. Refer to Division 01.

1.17 CONTRACTOR-PREPARED SHOP DRAWINGS

A. Refer to Division 01.

1.18 PRODUCT DATA

A. Refer to Division 01.

1.19 SAMPLES

A. Refer to Division 01.

1.20 MANUFACTURER'S INSTRUCTIONS

A. Refer to Division 01.

1.21 MANUFACTURER'S CERTIFICATES

A. Refer to Division 01.

1.22 QUALITY CONTROL SERVICES

A. Refer to Division 01.

1.23 MANUFACTURER'S FIELD SERVICES AND REPORTS

A. Refer to Division 01.

1.24 CONTRACT CLOSEOUT

A. Closeout Procedures

1. Refer to Division 01.

B. Final Cleaning

1. Refer to Division 01.

- C. Adjusting
 - 1. Refer to Division 01.
- D. Project Record Documents
 - 1. Refer to Division 01.

1.25 O&M DATA

- A. Quality Assurance
 - 1. Refer to Division 01.
- B. Format
 - 1. Refer to Division 01.
- C. Contents, Each Volume
 - 1. Refer to Division 01.
- D. Manual for Materials and Finishes
 - 1. Refer to Division 01.
- E. Manual for Equipment and Systems
 - 1. Refer to Division 01.
- F. Instruction of Owner Personnel
 - 1. Refer to Division 01.
- G. Submittals
 - 1. Refer to Division 01.
- H. Warranties
 - 1. Refer to Division 01.

1.26 REGULATORY REQUIREMENTS

- A. Conform to 2012 International Mechanical Code with City of Evanston Amendments, NFPA 13, latest editions.
- B. Obtain permits and request inspections from Evanston Building Department.
- C. Conform to all other governing agencies and authorities.

PART 2 - PRODUCTS

2.1 MATERIAL AND EQUIPMENT

- A. Refer to Division 01.

2.2 STORAGE AND PROTECTION

- A. Refer to Division 01.

2.3 PRODUCT OPTIONS

- A. Refer to Division 01.

2.4 SUBSTITUTIONS

- A. Refer to Division 01.

PART 3 - EXECUTION

3.1 SCOPE

- A. Work included under Divisions 20, 21, 22, and 23 shall include all labor, services, materials and equipment and performance of all work required for installation of mechanical, plumbing, and fire suppression systems as shown on Drawings and as herein specified in following sections.

3.2 INTERPRETATION OF CONSTRUCTION DOCUMENTS

- A. Should there be discrepancy or a question of intent, refer matter to [Architect]/[Engineer] for decision before ordering any equipment or materials or before starting any related work.
- B. Drawings and Specifications are to be taken together. Work specified and not shown or work shown and not specified shall be performed or furnished as though mentioned in both Specifications and Drawings. If there is discrepancy between Drawings and Specifications as to quantity or quality to be provided, the greater quantity or better quality shall be provided.
- C. Minor items and accessories or devices reasonably inferable as necessary to complete and proper installation and operation of any system shall be provided by Contractor for such system whether or not specifically called for by Specifications or Drawings.
- D. [Architect]/[Engineer] may change location of any equipment 5' and any piping, ductwork, conduit, etc. 10' in any direction without extra charge, provided such changes are made before installation.
- E. Locations of items not definitely fixed by dimensions are approximate only and exact locations necessary to secure the best conditions and results shall be determined at the site and shall be subject to review and approval by Architect.
- F. Follow drawings in laying out work, check drawings of other trades to verify spaces in which work will be installed, and maintain maximum headroom and space conditions at all points.
 - 1. Where headroom or space conditions appear inadequate, notify Architect or Owner's field representative before proceeding with installation.
 - 2. Duct and pipe rerouting and duct size changes shall be made at no additional cost to the Owner.
- G. Furnish advance information on locations and sizes of frames, boxes, sleeves and openings needed for the work, and also furnish information and shop drawings necessary to permit installation of other work without delay.
- H. Where there is evidence that parts of the Work specified in Divisions 20, 21, 22, and 23 will interfere with other work, assist in working out space conditions to make satisfactory adjustments, revise and submit coordinated shop drawings.
- I. After review and without additional cost to the Owner, make minor modifications in the work as required by structural interferences, by interferences with work of other sections or for proper execution of the work.
- J. Work installed before coordinating with other work so as to cause interference with other work shall be changed and corrected without additional cost to the Owner.
- K. Drawings are diagrammatic in nature and are a graphic representation of requirements and shall be followed as closely as actual building construction will permit. All changes from the plans necessary

to make the work conform to the building as constructed and to fit the work of other trades or to conform to rules of the Governmental Authorities having jurisdiction, NFPA, OSHA and the Owner's Insurance Underwriters, shall be made by the Contractor without extra cost to the Owner.

- L. The layout of the piping, ductwork, equipment, etc., as shown on the drawings shall be checked and exact locations shall be determined by the dimensions of the equipment approved and the Contractor shall obtain approval for the revised layout before the apparatus is installed. The Contractor shall field measure or consult existing record Architectural and Structural Drawings if available for all dimensions, locations of partitions, locations and sizes of structural supports, foundations, etc.
- M. Omission in the Drawings and/or Specifications of any items necessary for the proper completion or operation of the work outlined in this specification shall not relieve the Contractor from furnishing same without additional cost to the Owner.
- N. The Equipment Shop Drawings will be furnished to the Contractor before roughing in. Contractor shall not install any piping or ductwork for said equipment until he has received approved shop drawings for same.

3.3 PROJECT/SITE CONDITIONS

- A. Each Contractor shall visit the site prior to bid submission to determine all existing conditions that may affect his work and shall make appropriate allowances for such conditions in his bid. Failure to visit the site shall not be cause for a request for additional compensation later in the project during construction.
- B. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- C. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of [Owner] [Architect][/][Engineer] before proceeding.

3.4 ALTERATIONS IN PRESENT BUILDING AND SYSTEMS

- A. Contractor shall take particular note of the revisions and alterations to the existing systems, facilities and equipment due to the new construction as indicated on the Drawings and/or in Specification. Contractor shall remove, reroute or alter all services, ductwork, etc., as required or as indicated on the drawings.
 - 1. The Contractor shall maintain all services in the existing building. In case, where new service connections are to be made to existing services and service interruptions can in no way be avoided, the service interruptions shall be with the minimum of inconvenience to the Owner and the work shall be done at such time of any day, Saturday and Sunday included, and only as directed by the Owner or the Architect.

3.5 ERECTION & WORKMANSHIP

- A. Contractor is to be responsible for all work fitting into place in satisfactory, neat and workmanlike manner in every particular, to approval of [Architect][/][Engineer].
- B. Unless explicitly stated to contrary, each Contractor shall furnish and install each item of equipment or material hereinafter specified, complete with all necessary fittings, supports, trim, piping, insulation, etc., as required for complete and operating installation.

- C. Equipment and materials shall be installed according to manufacturer's instruction unless otherwise specifically directed by Contract Documents.
- D. Contractor shall provide all necessary OSHA approved rigging, scaffolding, tools, tackle, labor, etc., necessary for the complete installation of the equipment.
- E. Contractor shall adapt his work to job conditions and make such changes as required and permitted by the Architect such as moving his work to clear beams, joints, light fixtures, etc., adjusting risers, etc. avoiding interferences with windows and openings, etc. raising or lowering his work to permit the passing of ductwork or the work of other trades, etc., all as required or as job conditions dictate, without any additional costs to the Owner.
- F. All appliances and equipment shall be installed and connected with best engineering practices and in accordance with the manufacturer's best instructions and recommendations.
- G. Work done by Contractor at the site in the execution of this Project shall be performed only by skilled mechanics, recognized as such in their respective trades in the direct employ either of the Contractor proper or of affiliate firms which have a longstanding and continuing formal agreement with the Contractor for providing the rendered services on similar work of this type.

3.6 PROTECTION FROM INJURY

- A. All pipes, fixtures, traps, equipment, and other parts of the Work shall be protected against injury by freezing or exposure to the weather during construction while stored or installed in place.

3.7 MECHANICAL AND ELECTRICAL WORK COORDINATION

- A. Refer to Division 01.

3.8 CUTTING AND PATCHING

- A. Refer to Division 01.

3.9 ACCESS PANELS

- A. Where control valves, shutoff valves, drip traps, heating coils, dampers, pull boxes or other specialties, which require service or adjustment, are installed above inaccessible type furred ceilings or within furred walls, Contractor whose equipment is involved shall furnish and install access panels as required.
- B. Access panels shall be of sufficient size to make possible servicing, adjustment, removal and replacement of concealed equipment through opening provided. Panels shall be sized as shown on drawings, or if sizes are not shown, shall be minimum of 16" x 24" in walls and 24" x 24" in ceilings.
- C. Contractor shall confer with other trades with respect to access panel locations and shall, wherever practical, group valves, traps, dampers, etc. in such way as to be accessible from single panel and eliminate as many access panels as possible.
- D. Submit shop drawings for review before ordering panels. Where fire rating is required, furnish label doors compatible with fire rating of assembly.

3.10 SOUND CONTROL

- A. Mechanical penetrations into patient rooms shall be maintained airtight to prevent sound transfer.

- B. Piping, ductwork, etc. shall pass through sleeves tightly packed with glass fiber or oakum and caulked on both sides with non-hardening acoustical sealant. Refer to Division 20 Section 20 0517, "Penetrations for Mechanical, Plumbing, and Fire Suppression."

3.11 FIRE RATED PENETRATIONS

- A. Sleeves for pipes and ducts through fire rated and fire resistive floors and walls shall be constructed of materials classified by UL to provide fire stopping equal to time rating of construction being penetrated. Use asbestos free materials that comply with applicable codes and have been tested under positive pressure in accordance with UL 1479 or ASTM E 814.
- B. Install penetration seal materials in accordance with printed instructions of the UL Fire Resistance Directory and in accordance with manufacturer's instruction.
- C. Seal holes or voids made by penetrations to ensure an effective smoke barrier.
- D. Where floor openings without penetrating items are more than 4" in width and subject to traffic or loading, install fire stopping materials capable of supporting same loading as floor.
- E. Protect materials from damage on surfaces subject to traffic.
- F. Examine penetration sealed areas to ensure proper installation before concealing or enclosing areas.
- G. Keep areas of work accessible until inspection by applicable code authorities.
- H. Perform under this section patching and repairing of fire stopping caused by cutting or penetration by other trades.
- I. Clean up spills of liquid components.
- J. Neatly cut and trim materials as required.
- K. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

3.12 PROTECTION OF ELECTRICAL EQUIPMENT

- A. Contractor shall furnish and install sheet metal drain pans beneath piping that is routed above electrical equipment and/or above the 3' access space in front of such equipment. Electrical equipment, for the purpose of addressing drain pan requirements, shall be defined as free-standing or wall-mounted switchgear, transformers, distribution boards or motor control centers. Piping includes, but is not limited to, plumbing, fire suppression, mains (not branch piping with sprinkler heads), hydronic heating or cooling, steam and condensate, and fuel systems.
 - 1. Drain pans shall be 20 gauge galvanized sheet metal with a minimum 4" high turned up edge. Bottom of drain pan shall slope to a single drainage point at 1/8" per foot. A 1" diameter clear plastic tube shall allow collected fluid to drain to the nearest open site floor drain. Secure plastic tubing to building structure only.
 - 2. Drain pan shall be hung from building structure with angle iron trapeze hangers (no hanger shall penetrate the drain pan). Consider drain pan to be full of water for hanger load calculations.
 - 3. Drain pans shall include liquid detectors with alarms only if noted on the drawings.
- B. Provide sprinkler heads beneath drain pan only as required by NFPA.
- C. Contractor shall include provisions to adjust the local lighting layout, at no extra cost to Owner, in order to accommodate any detrimental effect the drain pan has on the illumination of the electrical equipment and access space.

3.13 STARTING OF SYSTEMS

- A. Refer to Division 01.

3.14 TESTING, ADJUSTING AND BALANCING

- A. Contractor shall appoint, employ and pay for services of independent firm to perform testing, adjusting and balancing.
- B. Independent firm will perform services specified in Division 23 Section 23 0593, "Testing, Adjusting, and Balancing for HVAC," except for factory tests.
- C. Reports will be submitted by independent firm to Engineer indicating observations and results of tests and indicating compliance or non-compliance with specified requirements and with requirements of Contract Documents.

3.15 ALTERATION PROJECT PROCEDURES

- A. Refer to General Conditions and Division 01 and Division 02.

3.16 DEMONSTRATIONS AND INSTRUCTIONS TO OWNER PERSONNEL

- A. Refer to Division 01.

END OF SECTION

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**SECTION 20 0501
MINOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION DEMOLITION**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Minor demolition specifically applicable to Divisions 20, 21, 22, 23, 27, and 28.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Refer to [General Conditions] [and] [Division 01].
- B. Materials and equipment for patching and extending work: As specified in individual Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify field measurements, equipment location, piping and ductwork sizes and arrangements as shown on Drawings.
- B. Verify that abandoned piping, ductwork and equipment serve only abandoned facilities.

3.2 PREPARATION

- A. Disconnect mechanical systems in walls, floors and ceilings scheduled for removal.
- B. Coordinate utility service shut-downs with Utility Companies.
- C. Provide temporary connections to maintain existing systems in service during construction.
- D. Existing Mechanical Systems: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and new connections. Obtain permission from Owner at least 48 hours before partially or completely disabling system. Minimize shut-down duration.

3.3 DEMOLITION AND EXTENSION OF EXISTING SYSTEMS

- A. Demolish and extend existing work under provisions of General Conditions, Division 01.
- B. In general, mechanical, plumbing, fire suppression, medical gas, and electrical remodeling work is shown on Drawings but carefully study all drawings for all contracts for "demolition" and "remodeling" work in existing building and field check to verify locations where such work is being done to determine exact extent of work required. No extra will be allowed for additional work required because of demolition or remodeling whether or not work is specifically noted, itemized or shown on Drawings.
- C. Remove existing equipment and materials pertaining to contract as specified or as required, whether shown on Drawings or not, to prepare for new work of all contracts.
- D. Where necessary, reroute piping, ducts, etc. from within walls, floors, ceilings, etc. being removed. Contractor involved with interrupted service shall be responsible for accomplishing required work whether shown on Drawings or not.

- E. Cap all abandoned or terminated piping, etc. below floor, behind wall surface, above ceiling, etc., as required to be completely concealed after new work is complete.
- F. Cap or plug all pipes, valves, fittings, etc. left open after demolition if they are not to be reused.
- G. Maintain access to existing mechanical installations which remain active. Modify installation or provide access panel as appropriate.
- H. Extend existing installations using materials and methods compatible with existing mechanical installations.

3.4 DISPOSITION OF REMOVED EQUIPMENT

- A. Where existing materials or equipment are specified to be removed from service, respective Contractor shall take possession of same, coordinate with Owner where items are to be stored or remove unwanted items from site promptly, except as specified below or unless otherwise noted on Drawings.
- B. All salvageable material and equipment, including but not necessarily limited to plumbing fixtures, heating units, air conditioning units, piping, valves, etc., shall be removed and maintained in as good condition as possible and turned over to Owner. However, if Owner decides any such materials are of no value to him, then they shall become property of Contractor who shall remove such discarded work from premises and dispose of same.
- C. Existing equipment or systems, etc. which are specified to be replaced by new equipment, or system etc. shall not be removed from service until the new equipment, materials, systems, etc. have actually arrived at project site.

3.5 INSTALLATION

- A. Install relocated materials and equipment under the provisions of Division 01.

END OF SECTION

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SECTION 20 0513
MOTOR REQUIREMENTS FOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION EQUIPMENT

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Motor requirements specifically applicable to Divisions 20, 21, 22, and 23, including:
 - 1. Single-phase general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on ac power systems up to 600 volts.
 - 2. Three-phase general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on ac power systems up to 600 volts.
- B. Coordination
 - 1. Coordinate features of motors, installed units, and accessory devices to be compatible with the following such that all items furnished constitute a properly related package:
 - a. Motor starters
 - b. Motor controllers
 - c. Variable frequency drives
 - d. Torque, speed and horsepower requirements of the load
 - e. Ratings and characteristics of supply circuit and required control sequence
 - f. Ambient and environmental conditions of installation location
 - 2. Providing a motor to satisfy the efficiency requirements specified herein, is the responsibility of the Contractor. If any given manufacturer or supplier of the motorized equipment cannot provide a motor that satisfied the specified efficiency requirements, the Contractor is responsible for any and all steps necessary to provide an adequate motor including but not necessarily limited to:
 - a. Coordinating delivery and installation of an acceptable motor to the motorized equipment supplier for factory-installation.
 - b. Field-installation of an acceptable motor on the motorized equipment. Field installation shall not void the warranty of the motorized equipment.

1.2 DEFINITIONS

- A. Factory-installed motor: A motor installed by the motorized equipment manufacturer at the equipment manufacturer's factory as a component of the equipment.
- B. Field-installed motor: A motor installed on the motorized equipment at the Project site.

1.3 CODES AND STANDARDS (UTILIZE LATEST EDITION)

- A. ASHRAE 90: Energy Standard for Buildings except Low-Rise Residential Buildings
- B. AFBMA 9: Load Ratings and Fatigue Life for Ball Bearings
- C. ANSI/IEEE 112B: Test Procedure for Polyphase Induction Motors and Generators
- D. EISA: The Energy Independence and Security Act of 2007
- E. IECC: International Energy Conservation Code

- F. IEEE 112-2004: Standard Test Procedure for Polyphase Induction Motors and Generators
- G. IEEE 841-2001: Standard for Petroleum and Chemical Industry - Severe Duty Totally Enclosed Fan-Cooled (TEFC) Squirrel Cage Induction Motors - Up to and Including 370 kW (500 hp)
- H. NETA ATS: Acceptance Testing Specification
- I. NFPA 70: National Electrical Code
- J. NEMA MG : Motors and Generators
- K. UL 1004: Electric Motors

1.4 QUALITY ASSURANCE

- A. Manufacturer shall be a company specializing in manufacture of electric motors for the intended use and their accessories, with minimum three years documented product development, testing and manufacturing experience.
- B. All motors shall be UL 1004 listed.
- C. Motor efficiencies shall be based on the IEEE 112, Test Method B.

1.5 SUBMITTALS

- A. Preconstruction – Prior to construction provide the following in accordance with Division 01 and Specification 20 0500 – Basic Requirements for Mechanical, Plumbing, and Fire Suppression:
 - 1. Product Data
 - a. Submit manufacturer’s literature indicating:
 - (1) Type and size of motor
 - (2) Name plate data and rating
 - (3) Weight
 - (4) Conduit entry and ground lug locations
 - (5) Enclosure type and mounting arrangement
 - (6) Insulation class
 - (7) Information on coating or finishes
 - (8) Nominal minimum efficiency
 - (a) Provide statement that all motors 1 hp and larger meet “premium efficiency” requirements specified herein.
 - (9) Nominal minimum power factor
 - (10) Sound power levels in dba
 - b. Submit manufacturer’s test results verifying guaranteed minimum efficiency and power factor for all three phase motors larger than 1 hp.
 - c. Submit manufacturer’s literature for bearing protection grounding rings. If not integral to the motor supplied, but field installed as an option, also provide manufacturer’s installation instructions.
 - 2. Manufacturer’s installation and operating manuals.

B. Contract Closeout – At contract closeout provide the following in accordance with Division 01 and Specification 20 0500 – Basic Requirements for Mechanical, Plumbing, and Fire Suppression:

1. Operating and Maintenance Data including:
 - a. Product data
 - b. Installation instructions
 - c. Assembly drawings
 - d. Replacement parts list
 - e. Maintenance and operation instructions
2. Test Reports
 - a. Field installed motor test
 - b. Field installed bearing protection ring tests
3. Warranties

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site.
- B. Protect motors stored on-site from weather and moisture by maintaining factory covers and suitable weather-proof covering. For extended outdoor storage, remove motors from equipment and store separately.

1.7 SPARE PARTS

Not Applicable

PART 2 - PRODUCTS

2.1 MOTORS

- A. Acceptable Manufacturers
 1. Baldor Electric
 2. Emerson Motors
 3. GE Motors
 4. Leeson (Lincoln)
 5. Marathon Electric
 6. Siemens
 7. TECO – Westinghouse
- B. General Motor Requirements Applicable to All Motors
 1. Comply with the requirements in this section except when stricter requirements are specified on the drawings or Division 23 Equipment Sections.
 2. Comply with NEMA MG 1.
 3. Motor Size:
 - a. Motors shall be capable of driving the intended load and not exceeding the design horsepower.

- b. Motors shall be selected such that the brake horsepower (bhp), including drive losses of the driven equipment, does not exceed 90% of the motor nameplate rating at design conditions.
- 4. Visible Nameplate:
 - a. Provide a visible motor nameplate indicating motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model number, and service factor.
 - b. Nameplates for all three-phase motors shall also indicate power factor and efficiency.
 - c. Nameplate shall indicate "Premium Efficiency" where such a motor is provided.
- 5. Motor Characteristics:
 - a. Duty Rating:
 - (1) Continuous duty at ambient temperature of 104°F (40°C) and at altitude of 3,300 feet above sea level.
 - (2) Motors shall be capable of not less than six (6) starts in a twenty-four (24) hour period.
 - b. Capacity and Torque Characteristics:
 - (1) Sufficient to start, accelerate and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or service factor.
- 6. Enclosures:
 - a. Enclosure Material:
 - (1) Cast iron for motor frame 25 hp and larger.
 - (2) Rolled steel for motor frame sizes smaller than 25 hp.
 - b. Open drip proof (ODP) for indoor locations not in an airstream.
 - c. Totally enclosed fan cooled (TEFC) for all motors located within an airstream including within air handling unit housings, ducted airstreams, and ceiling or floor air plenums.
 - (1) Totally enclosed air over (TEAO) motors are acceptable for air handling units with fan arrays provided they meet the efficiency requirements of the TEFC motors.

C. Three Phase Motors

- 1. Efficiency:
 - a. Motor efficiencies shall at a minimum comply with the most recent editions of the International Energy Conservation Code and ASHRAE Standard 90.1.
 - b. All general purpose, three-phase motors from 1 hp up to 200 hp driving Division 21-, 22-, and/or 23-specified equipment (e.g. stand-alone fans, fans within air handling units, heating hot water pumps, chilled water pumps, domestic water pumps) shall be premium efficiency and meet the minimum efficiencies specified in the following table:

HP	TOTALLY ENCLOSED, FAN COOLED MOTORS			OPEN, DRIP-PROOF MOTORS		
	1200 rpm	1800 rpm	3600 rpm	1200 rpm	1800 rpm	3600 rpm
10	91.0	91.7	90.2	91.7	91.7	89.5
15	91.7	92.4	91.0	91.7	93.0	90.2

2. Service Factor

a. Per the following NEMA Service Factor Table

HP	900 RPM	1200 RPM	1800 RPM	3600 RPM
1½ to 150	1.15	1.15	1.15	1.15

b. Do not take advantage of service factors in selection of motors.

3. Rotor: Random-wound, squirrel cage.

4. Bearings:

- a. Grease lubricated anti friction ball bearings with housings equipped with plugged provision for re-lubrication, rated for minimum AFBMA 9, L 10 life of 150,000 hours for direct-coupled applications and 50,000 hours for belted applications. Calculate bearing load with NEMA minimum V belt pulley with belt center line at end of NEMA standard shaft extension. Stamp bearing sizes on nameplate.
- b. Motors not installed in horizontal position shall be provided with suitable bearings.
- c. Grease fittings shall be provided. Both fittings and drain plugs shall be fully accessible while the motor is in operation. Where motors are installed in an inaccessible location, the grease fitting shall be extended to an accessible location. High pressure hydraulic steel tubing and fittings shall be used.

5. Temperature Rise and Insulation:

- a. Motors 1 hp and larger: NEMA Class B temperature rise with Class F insulation.

6. Starting Code Designation:

- a. Motors smaller than 15 hp: Manufacturer's standard starting characteristics.
- b. Motors 15 hp and larger: NEMA starting Code F or Code G.

7. Motor windings shall be first grade copper.

D. Additional Requirements for Three Phase Motors Used with Variable Frequency Drives

- 1. Motor shall be "inverter-ready" by complying with or exceeding the NEMA MG1 Part 31 requirements regarding special purpose motors for use with variable frequency drives.
- 2. Windings shall be copper magnet wire with moisture-resistant insulation, varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses, produced by pulse-width modulated inverters.
- 3. Motors shall be equipped with shaft grounding ring(s) to dissipate potential VFD-induced motor shaft currents by grounding through the motor housing.
 - a. Provide one (1) grounding ring per motor.
 - b. Provide solid ring or split ring, based on grounding ring manufacturer's recommendations.
 - c. Shaft grounding brushes or insulated bearings are not acceptable.
 - d. Shaft Grounding Rings shall be factory-installed or field-installed by the motor manufacturer or field-installed by the contractor.
 - e. Acceptable Product: Aegis SGR Bearing Protection Ring as manufactured by Electric Static Technology.

- f. This provision for grounding devices shall not apply to motors used in environments defined as Class 1 Division 1, Division 2, or Class 1 Zone 1, Zone 2 hazardous locations.
- E. Single Phase Motor
- 1. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:
 - a. Permanent-split capacitor
 - b. Split phase
 - c. Capacitor start, inductor run
 - d. Capacitor start, capacitor run
 - 2. Multispeed Motors: Variable-torque, permanent-split-capacitor type.
 - 3. Bearings: Pre-lubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.

PART 3 - EXECUTION

2.2 APPLICATION

- A. Electrical Service
 - 1. Motors $\frac{3}{4}$ hp and larger shall operate on 480 or 208 volt, three-phase 60 Hertz, alternating current, except as otherwise noted.
- B. Motor speed shall not exceed 1,750 rpm unless otherwise specified.

2.3 INSTALLATION

- A. Factory Installed Motors
 - 1. Not used
- B. Field Installed Motors
 - 1. Examine area to receive field installation for compliance with required tolerances and other conditions affecting performance. Examine roughing-in of conduit systems to verify actual locations. Correct any deficiencies found during examination.
 - 2. Anchor motor assembly to base, adjustable rails or other support according to manufacturers' instructions. Level and align.
 - 3. Clean motors according to manufacturers' written instructions.
- C. Field Installed Bearing Protection Rings
 - 1. Verify applicable maximum and minimum temperature and humidity allowances with manufacturer's technical support.
 - 2. Based on motor application, motor size, motor frame, and bearing types, use shaft grounding ring kit that corresponds to shaft grounding ring manufacturer's installation recommendations and instructions.
 - 3. Based on manufacturer's installation instructions, clean the motor shaft and other motor surfaces to remove any coatings, paint or other nonconductive material to prepare all conducting surfaces.

4. Apply conductive shaft surface coating per manufacturer's recommendations and installation instructions.
5. As required by the installation and per manufacturer's recommendations and installation instructions:
 - a. Drill and tap installation holes in the motor end bracket per manufacturer's installation instructions.
 - b. Apply manufacturer supplied adhesive and hold in place until the adhesive sets.

2.4 TESTING

- A. Field installed motor test
 1. Run each motor. Demonstrate correct rotation, alignment and speed.
 2. Test interlocks and control features for proper operation.
 3. Verify that current in each phase is within nameplate rating.
 4. NETA Acceptance Test
 - a. Perform an acceptance test in accordance with NETA Acceptance Testing Specification, Section 7.15.1.
 - b. Correct any deficiencies found by test and repeat acceptance test.
 5. Provide test result report within two weeks of testing indicating that each of the above tests was completed and the results of those tests.
- B. Field installed bearing protection ring tests
 1. Pre-installation test:
 - a. Place the positive and negative meter leads on the shaft at a place where the grounding ring fibers will contact the shaft and read the resistance.
 - b. If the reading is higher than 2 ohms provide additional cleaning and retest.
 - c. Provide test result report within two weeks of testing indicating the resistance of each motor.
 2. Post-installation test:
 - a. Place one meter lead on the grounding ring and the other on the motor frame and read the resistance. NOTE: Motor must be grounded to common earth ground with drive according to application standards.
 - b. Provide test result report within two weeks of testing indicating the resistance of each motor.

END OF SECTION

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IDENTIFICATION FOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION SYSTEMS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Identification of mechanical products installed under Divisions 20, 21, 22, and 23 as defined below:
 - 1. Equipment labels

1.2 DEFINITIONS

- A. AHU: Air-handling unit
- B. TC: Temperature controls

1.3 CODES AND STANDARDS (USE LATEST EDITION)

- A. American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME)
 - 1. ANSI/ASME A13.1: Scheme for the Identification of Piping Systems.
- B. American Public Works Association (APWA)
 - 1. APWA Uniform Color Code for marking underground utility lines.
- C. ASTM International (ASTM)
 - 1. ASTM D2103: Standard Specification for Polyethylene Film and Sheeting
 - 2. ASTM D2578: Standard Test Method for Wetting Tension of Polyethylene and Polypropylene Films
- D. International Codes
 - 1. International Mechanical Code (IMC)
- E. Underwriters Laboratories Inc. (UL)
 - 1. UL E-84-03: Standard Test Method for Surface Burning Characteristics of Building Materials.

1.4 QUALITY ASSURANCE

- A. For hydronic piping, conform to ANSI/ASME A13.1 requirements for color, length of color field and letter height.
- B. Stencils shall not be used.
- C. Labels/markers listed by the manufacturer as "economy" or "value" shall not be used.

1.5 SUBMITTALS

- A. Preconstruction – Prior to construction provide the following in accordance with Division 01 and Specification 20 0500 – Basic Requirements for Mechanical, Plumbing, and Fire Suppression:
 - 1. Product Data: For each type of product indicated provide:
 - a. Manufacturer's data including colors, materials, wording, symbols, letter size, methods of attachment and color coding for mechanical and electrical identification of piping, ductwork and equipment.
 - b. Submit manufacturer's installation instructions.

- c. Valve Schedule: Submit proposed valve identification for approval prior to installing valve tags. Include valve tag number, location, system served, and function.
- B. Contract Closeout – At contract closeout provide the following in accordance with Division 01 and Specification 20 0500 – Basic Requirements for Mechanical, Plumbing, and Fire Suppression:
 1. Valve Schedule: Provide “as-installed” valve tag schedule indicating valve tag number, location, system served, and function for Owner at completion of project.
 2. Warranties

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Brimar Identification and Safety Products
- B. Kolbi Pipe Marker Co.
- C. Marking Services Inc. (MSI)

2.2 EQUIPMENT LABELS

- A. General Requirements for Equipment Labels
 1. Label Content: Include equipment's Drawing designation or unique equipment number.
 2. Equipment Label Schedule: For each item of equipment to be labeled provide an equipment label schedule on 8½" x 11" bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.
 3. Label Size: Length and width may vary for required label content shall not be less than 2" x 4".
 4. Lettering Size: A minimum letter size of 1½" high. If label must be viewed from greater than 72" away, the minimum text size is 1½". Secondary lettering shall be two-thirds to three-fourths the size of principal lettering.
- B. Indoor Equipment Labels
 1. Multilayer, multicolor, 3-ply plastic labels for mechanical engraving and having predrilled holes for attachment hardware. Able to withstand temperatures up to 160°F. Minimum plastic label thickness shall be as follows:
 - a. ¼" for labels up to and including either a maximum area of 18 square inches or 6" in lengths.
 - b. ⅜" for labels larger than either 18 square inches in area or 6" in length.
 2. Contact-type permanent adhesive, compatible with label and with substrate shall be utilized.
 3. Basis of Design MSI Engraved Plastic Equipment Tags & Signs

2.3 LABELS FOR MISCELLANEOUS ELECTRICAL FOR TEMPERATURE CONTROLS

- A. Self-Adhesive Pipe Labels
 1. Printed plastic with contact-type, permanent-adhesive backing
 2. Black text on orange labels

3. Basis of Design: MSI-900 Conduit and Electrical ID

PART 3 - EXECUTION

A. Additional Requirements for Equipment Labels

1. Provide labeling for all mechanical and plumbing equipment including but not limited to the equipment defined below. Equipment label text shall provide the name and number of the identified equipment, as well as the system or location which the equipment serves. Indicate when equipment is stand-by. Examples of the required text is given below:
 - a. Fans: (e.g.TE-1, toilet exhaust for lobby toilets)
 - b. Variable frequency drives: (VFD-1, VFD for AHU-1 supply fan)
 - c. Temperature control panels and other major control equipment
2. Confirm equipment numbering scheme with Owner; provide different numbering scheme than that shown on drawings if required by Owner. If Owner has no preference, number as shown on drawings.

END OF SECTION

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SECTION 20 2923
VARIABLE FREQUENCY DRIVES FOR MECHANICAL, PLUMBING, AND FIRE SUPPRESSION

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. This Section includes solid-state VFDs as scheduled for speed control of three-phase, squirrel-cage induction motors specifically applicable to Divisions 20, 21, 22, and 23 for mechanical, plumbing, and fire suppression systems (variable torque).

1.2 DEFINITIONS

- A. BMS: Building management system
- B. IGBT: Integrated gate bipolar transistor
- C. LAN: Local area network
- D. PID: Control action, proportional plus integral plus derivative
- E. PWM: Pulse-width modulated
- F. VFD: Variable frequency drive

1.3 CODES AND STANDARDS (USE LATEST EDITION)

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The edition/revision of the referenced publications shall be the latest date as of the date of the Contract Documents, unless otherwise specified.
 - 1. ANSI/IEC 60529: Degrees of Protection Provided by Enclosures (IP Code)
 - 2. CSA C22.2 No. 14-13 (Industrial Control Equipment)
 - 3. FCC CFR 47 Part 15 Subpart B
 - 4. IEC 61800-3 – Adjustable speed electrical power drive systems – Part 3: EMC requirements and specific test methods
 - 5. IEEE Standard 519: Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems
 - 6. NEMA ICS 3.1: Guide for the Application, Handling, Storage, Installation, and Maintenance of Medium-Voltage AC Contactors, Controllers, and Control Centers
 - 7. NEMA ICS 7.1: Safety Standards for Construction and Guide for Selection, Installation, and Operation of Adjustable-Speed Drive Systems
 - 8. NEMA 250: Enclosures for Electrical Equipment (1000 Volts Maximum)
 - 9. OSHPD: California Office of Statewide Health Planning and Development
 - 10. UL 508A: Standard for Industrial Control Panels
 - 11. UL 508C: Standard for Power Conversion Equipment
 - 12. UL 61800-5-1: Standard for Adjustable Speed Electrical Power Drive Systems – Part 5-1: Safety Requirements – Electrical, Thermal and Energy

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Maintain, within 100 miles (160 km) of project site, a service center capable of providing training, parts, and emergency maintenance and repairs.
- B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, with the experience and capability to conduct the testing indicated; NETA member.
- C. Source Limitations: Obtain VFDs of a single type through one source from a single manufacturer.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- E. Product Selection for Restricted Space: Drawings indicate maximum dimensions for VFDs, minimum clearances between VFDs, and adjacent surfaces and other items. Comply with indicated dimensions and clearances.
- F. Comply with NFPA 70.
- G. Minimum meantime between failure (MTBF) ratings of 25 years (219,000 hours).

1.5 SUBMITTALS

- A. Preconstruction – Prior to construction provide the following in accordance with Division 01 and Specification 20 0500 – Basic Requirements for Mechanical, Plumbing, and Fire Suppression:
 - 1. Product Data: For each type of VFD provide:
 - a. Dimensioned plans, elevations, and sections
 - b. Mounting arrangements
 - c. Location for conduit entries
 - d. Shipping and operating weights
 - e. Features
 - f. Performance
 - g. Electrical ratings
 - h. Characteristics
 - i. Finishes
 - j. Required clearances and service space
 - k. Each installed unit's type and details
 - l. Nameplate legends
 - m. Short-circuit current ratings of integrated unit
 - n. Factory settings
 - o. Wiring Diagrams
 - 2. Coordination Drawings: Floor plans showing dimensioned layout, required working clearances, and required area above and around VFDs where pipe and ducts are prohibited. Show VFD layout and relationships between electrical components and adjacent structural and mechanical elements. Show support locations, type of support, and weight on each support. Indicate field measurements.
 - 3. Qualification Data: For testing agency and manufacturer.
 - 4. Manufacturer's installation and operating manuals.

- B. Contract Closeout – At contract closeout provide the following in accordance with Division 01 and Specification 20 0500 – Basic Requirements for Mechanical, Plumbing, and Fire Suppression:
1. Operating and Maintenance Data including:
 - a. Product data
 - b. Installation instructions
 - c. Assembly drawings
 - d. Replacement parts list
 - e. Maintenance and operation instructions
 - f. Instructions for testing and adjusting overcurrent protective devices
 - g. Load-Current and List of Settings of Adjustable Overload Relays: Compile after motors have been installed and arrange to demonstrate that VFD programming settings have been set to suit actual motor to be protected.
 2. Test Reports
 - a. Manufacturer Start-Up Report
 3. Warranties

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store VFDs indoors in clean, dry space with uniform temperature to prevent condensation. Protect VFDs from exposure to dirt, fumes, water, corrosive substances, and physical damage.
- B. If stored in areas subject to weather, cover VFDs to protect them from weather, dirt, dust, corrosive substances, and physical damage. Remove loose packing and flammable materials from inside controllers; install electric heating of sufficient wattage to prevent condensation.

1.7 WARRANTY

- A. Warranty shall be 24 months from the date of certified start-up. The warranty shall include all parts, labor, travel, and expenses.

1.8 MAINTENANCE

- A. Cooperate with the Owner during testing, adjusting, and balancing (TAB), phase of construction, to minimize conflicts.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers and Products: Subject to compliance with specified requirements, provide products from a single manufacturer from the following:
 1. VFDs 75 HP and less (6-pulse with built-in 5% line impedance):
 - a. ABB ACH580
 - b. Eaton HMAX (H-Max)
 - c. Danfoss VLT FC-102
 - d. Yaskawa Z1000

2.2 VARIABLE FREQUENCY DRIVES

- A. Description: NEMA ICS 2, IGBT, PWM, VFD; listed and labeled as a complete unit and arranged to provide variable speed of a standard NEMA MG 1, Parts 30 and 31, three-phase, induction motor by adjusting output voltage and frequency.
- B. PWM Design:
 - 1. For motors 75 HP and less, the drive shall use a minimum of six-pulse PWM technology with 5% built-in line impedance.
 - 2. For motors 100 HP and above 18-pulse PWM or Matrix technology shall be used.
- C. Design and Rating: Match load type such as fans, blowers, and pumps; and type of connection used between motor and load such as direct or through a power transmission connection.
- D. Output Frequency Rating: Three-phase; 0 to 120 Hz.
- E. Unit Operating Requirements
 - 1. Input AC voltage tolerance of $\pm 10\%$ of voltage rating shown on plans
 - 2. Input frequency tolerance of 60 Hz, ± 5 Hz
 - 3. Capable of driving full load, under the following conditions, without derating:
 - a. Ambient Temperature: 14°F to 104°F
 - b. Humidity: Less than 95% (non-condensing)
 - c. Altitude: 3,300 feet (1,000 m); higher altitudes achieved by derating
 - 4. Minimum Efficiency: 96% at half speed; 98% at full speed
 - 5. Minimum Displacement Primary-Side Power Factor: 98%
 - 6. Overload Capability (variable torque): 110% the rated full load current for 60 seconds, 180% of rated full load current
 - 7. Starting Torque: 100% of rated torque or as indicated
 - 8. Speed Regulation: $\pm 3\%$
 - 9. Isolated control interface to allow controller to follow control signal over an 11:1 speed range
- F. Internal Adjustability Capabilities
 - 1. Minimum Speed: 5 to 25% of maximum rpm
 - 2. Maximum Speed: 80 to 100% of maximum rpm
 - 3. Acceleration: Adjustable from 0 to 6,000 seconds
 - 4. Deceleration: Adjustable from 0 to 6,000 seconds
 - 5. Current Limit: 50% to a minimum of 110% of maximum rating
- G. Self-Protection and Reliability Features
 - 1. Input transient protection by means of surge suppressors
 - 2. Under- and over-voltage trips; inverter over-temperature, overload, and overcurrent trips
 - 3. Adjustable Motor Overload Relay, Class 20
 - 4. Instantaneous line-to-line and line-to-ground overcurrent trips

5. Loss-of-phase protection
 6. Reverse-phase protection
 7. Short-circuit protection
 8. Motor over-temperature fault
 9. Dynamic braking
- H. Automatic Reset and Restart: To attempt three restarts after controller fault or on return of power after an interruption and before shutting down for manual reset or fault correction. Bi-directional autospeed search shall be capable of starting into rotating loads spinning in either direction and returning motor to set speed in proper direction, without damage to controller, motor, or load.
- I. Power-Interruption Protection: To prevent motor from re-energizing after a power interruption until motor has stopped.
- J. Torque Boost: Automatically vary starting and continuous torque to at least 1.5 times the minimum torque to insure high-starting torque and increased torque at slow speeds.
- K. Input Line Conditioning: All VFDs shall be provided with a 5% input line reactor/choke.
- L. Output Line Conditioning: Contractor shall coordinate motor and VFD compatibility. Provide a dV/dt filter if the cable distance or motor design requires use of a filter.
- M. Status Pilot Lights: Door-mounted light indicators or keypad indication of the following conditions:
1. Power on
 2. Run
 3. Fault
- N. Panel-Mounted Operator Station: Start-stop and auto-manual selector switches with manual speed control potentiometer and elapsed time meter. Equivalent functionality via the VFD's keypad is acceptable.
- O. Digital Display: The VFD shall provide a LCD display capable of displaying multiple lines of text on the VFD's operating values. The following are to be available at a minimum:
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. Motor Power (kW)
 8. kWh meter
 9. DC-link voltage (VDC)
 10. Set-point frequency (Hz)
 11. Motor output voltage (V)
 12. Analog Input Values

13. Analog Output Values
 14. Digital Input Status
 15. Digital Output Status
- P. Control Signal Interface: Provide VFD with the following:
1. Electric Input Signal Interface: A minimum of two analog inputs (0 to 10 V or 0/4-20 mA) and six programmable digital inputs.
 2. Remote Signal Inputs: Capability to accept any of the following speed-setting input signals from the BMS or other control systems:
 - a. 0 to 10-VDC
 - b. 4-20 mA
 - c. Potentiometer using up/down digital inputs
 - d. Fixed frequencies using digital inputs
 - e. RS485 & RS232
 - f. Keypad display for local hand operation
 3. Output Signal Interface:
 - a. A minimum of two analog output signals (0/4-20 mA), which can be programmed to any of the following:
 - (1) Output frequency (Hz)
 - (2) Output current (load)
 - (3) DC-link voltage (VDC)
 - (4) Motor torque (percent)
 - (5) Motor power
 - (6) Motor voltage
 - (7) Motor speed (rpm)
 - b. A minimum of three programmable dry circuit relay outputs (Form C, 120VAC, 2 amp) for remote indication of the following:
 - (1) Motor running
 - (2) Ready
 - (3) At speed
 - (4) Jogging
 - (5) Fault
 - (6) Over-temperature
- Q. Communications: Coordinate with building BAS provider to provide a VFD compatible with the BAS. At a minimum, VFD shall have one of the following communications capabilities and protocols that are compatible with the building automation system:
1. BACnet
 2. Siemens
- R. The VFD must meet IEC 61800-3 for 1st environment, restricted distribution.

2.3 ENCLOSURES

- A. For Indoor Applications: All standard and optional features shall be housed in a single NEMA 1 plenum-rated enclosure with a U.L. Certification label.

2.4 ACCESSORIES

- A. Devices shall be factory installed in controller enclosure, unless otherwise indicated.
- B. Standard Displays
 - 1. Output frequency (Hz)
 - 2. Set-point frequency (Hz)
 - 3. Motor current (amperes)
 - 4. DC-link voltage (VDC)
 - 5. Motor torque (percent)
 - 6. Motor speed (rpm)
 - 7. Motor output voltage (V)
- C. 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

2.5 FACTORY FINISHES

- A. Manufacturer's standard prime-coat finish ready for field painting.
- B. Finish: Manufacturer's standard paint applied to factory-assembled and factory-tested VFDs before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, surfaces, and substrates to receive VFDs for compliance with requirements, installation tolerances, and other conditions affecting performance.
- B. Examine roughing-in for conduit systems to verify actual locations of conduit and motor connection points before VFD installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

- A. Select features of each VFD to coordinate with ratings and characteristics of supply circuit and motor; required control sequence; and duty cycle of motor, drive, and load.
- B. Select rating of controllers to suit motor controlled.

3.3 INSTALLATION

- A. Anchor each VFD assembly to steel-channel sills arranged and sized according to manufacturer's written instructions. Attach by bolting. Level and grout sills flush with VFD mounting surface.
- B. Install VFDs on concrete bases, where applicable, complying with Division 20 Section 20 0529, "Hangers and Supports for Mechanical, Plumbing and Fire Suppression Systems."
- C. Coordinate layout and installation of VFDs with other construction including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- D. Coordinate size and location of concrete bases where required. Cast anchor-bolt inserts directly into bases.
- E. Where the VFD is mounted above the roof line, coordinate installation of roof curbs, equipment supports, and roof penetrations.
- F. Coordinate features of VFDs, installed units, and accessory devices with pilot devices and control circuits to which they connect.
- G. Coordinate features, accessories, and functions of each VFD and each installed unit with ratings and characteristics of supply circuit, motor, required control sequence, and duty cycle of motor and load.
- H. Motors intended for use with variable frequency drives shall be "inverter-ready" by complying with or exceeding the NEMA MG1 Part 31 requirements regarding special purpose motors for use with variable frequency drives.
 1. Windings shall be copper magnet wire with moisture-resistant insulation, varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses, produced by pulse-width modulated inverters.
 2. Motors shall be equipped with shaft grounding ring(s) to dissipate potential VFD-induced motor shaft currents by grounding through the motor housing.
 - a. Provide one (1) grounding ring per motor.
 - b. Provide solid ring or split ring, based on grounding ring manufacturer's recommendations.
 - c. Shaft grounding brushes or insulated bearings are not acceptable.
 - d. Shaft Grounding Rings shall be factory-installed or field-installed by the motor manufacturer or field-installed by the contractor.
 - e. Acceptable Product: Aegis SGR Bearing Protection Ring as manufactured by Electric Static Technology.
 - f. This provision for grounding devices shall not apply to motors used in environments defined as Class 1 Division 1, Division 2, or Class 1 Zone 1, Zone 2 hazardous locations.
 3. Motors are furnished and installed by mechanical or plumbing contractor, wired by electrical contractor.

3.4 IDENTIFICATION

- A. Identify VFDs, components, and control wiring according to Division 20 Section 20 0553, "Identification for Mechanical, Plumbing, and Fire Suppression Systems."
- B. Operating Instructions: Frame printed operating instructions for VFDs, including control sequences and emergency procedures. Fabricate frame of finished metal, and cover instructions with clear acrylic plastic. Mount on front of VFD units.

3.5 CONTROL WIRING INSTALLATION

- A. Install wiring between VFDs and remote devices according to Electrical Specifications.
- B. Bundle, train, and support wiring in enclosures.
- C. Connect selector switch and other automatic-control devices where available.
 - 1. Connect selector switches with control circuit in both hand and automatic positions for safety-type control devices such as low-pressure and high-pressure cutouts, high-temperature cutouts, and motor overload protectors.

3.6 CONNECTIONS

- A. Conduit installation requirements are specified in Electrical Specifications. Drawings indicate general arrangement of conduit, fittings, and specialties.
- B. Ground equipment per the latest edition of NFPA 70 (NEC).
- C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.7 START-UP SERVICE

- A. Engage a factory-authorized service representative to perform start-up service.
- B. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements in Division 26 Sections.
- C. Complete installation and start-up checks according to manufacturer's written instructions.

3.8 ADJUSTING

- A. Set field-adjustable switches and circuit-breaker trip ranges.

3.9 TESTING

- A. Manufacturer Installation Start-Up
 - 1. Engage a factory-authorized service representative to inspect field assembled components and equipment installation, including pretesting and adjusting VFDs.
 - 2. Provide Start-Up report within two weeks of testing indicating completion of the Manufacturer Start-Up Certification for each VFD.

3.10 CLEANING

- A. Clean VFDs internally, on completion of installation, according to manufacturer's written instructions. Vacuum dirt and debris; do not use compressed air to assist in cleaning.

3.11 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain VFDs.

END OF SECTION

SPECIFICATIONS

DIVISION 23 MECHANICAL

SECTION 23 0100	COMMON WORK REQUIREMENTS FOR MECHANICAL
SECTION 23 0593	TESTING, ADJUSTING, AND BALANCING FOR HVAC
SECTION 23 0900	BASIC TEMPERATURE CONTROL REQUIREMENTS
SECTION 23 0903	TEMPERATURE CONTROL CONDUIT
SECTION 23 0904	TEMPERATURE CONTROL WIRING
SECTION 23 0906	TEMPERATURE CONTROL DEMOLITION
SECTION 23 3113	METAL AND FLEXIBLE DUCT
SECTION 23 3400	FAN MODULES WITH DIRECT DRIVE PLENUM FANS AND VFD CONTROL PANEL

**SECTION 23 0100
COMMON WORK REQUIREMENTS FOR MECHANICAL**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Basic requirements applicable to all Division 23 work.

1.2 RELATED SECTIONS

- A. All specification sections in Division 20 are applicable to Division 23. It is the responsibility of the Division 23 Contractor to obtain all Division 20 specifications and conform to all applicable requirements. Division 20 Sections included are:
 - 1. Section 20 0500: Basic Requirements for Mechanical, Plumbing, and Fire Suppression
 - 2. Section 20 0501: Minor Mechanical, Plumbing, and Fire Suppression Demolition
 - 3. Section 20 0513: Motor Requirements for Mechanical, Plumbing, and Fire Suppression Equipment
 - 4. Section 20 0517: Penetrations for Mechanical, Plumbing, and Fire Suppression
 - 5. Section 20 0553: Identification for Mechanical, Plumbing, and Fire Suppression Systems
 - 6. Section 20 2923: Variable Frequency Drives for Mechanical, Plumbing, and Fire Suppression

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.1 SCOPE

- A. Work included under Divisions 20 and 23 shall include all labor, services, materials, and equipment and performance of all work required for installation of plumbing systems as shown on Drawings and as specified.

END OF SECTION

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SECTION 23 0593
TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. This Section includes testing, adjusting, and balancing to produce design objectives for the following:
 - 1. Air systems

1.2 DEFINITIONS

- A. Adjust: To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.
- B. Balance: To proportion flows within the distribution system, including submains, branches, and terminals, according to indicated quantities.
- C. Barrier or Boundary: Construction, either vertical or horizontal, such as walls, floors, and ceilings that are designed and constructed to restrict the movement of airflow, smoke, odors, and other pollutants.
- D. Draft: A current of air, when referring to localized effect caused by one or more factors of high air velocity, low ambient temperature, or direction of airflow, whereby more heat is withdrawn from a person's skin than is normally dissipated.
- E. NC: Noise criteria.
- F. Procedure: An approach to and execution of a sequence of work operations to yield repeatable results.
- G. RC: Room criteria.
- H. Report Forms: Test data sheets for recording test data in logical order.
- I. Smoke-Control System: An engineered system that uses fans to produce airflow and pressure differences across barriers to limit smoke movement.
- J. Smoke-Control Zone: A space within a building that is enclosed by smoke barriers and is a part of a zoned smoke-control system.
- K. Stair Pressurization System: A type of smoke-control system that is intended to positively pressurize stair towers with outdoor air by using fans to keep smoke from contaminating the stair towers during an alarm condition.
- L. Static Head: The pressure due to the weight of the fluid above the point of measurement. In a closed system, static head is equal on both sides of the pump.
- M. Suction Head: The height of fluid surface above the centerline of the pump on the suction side.
- N. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
- O. System Effect Factors: Allowances used to calculate a reduction of the performance ratings of a fan when installed under conditions different from those presented when the fan was performance tested.
- P. TAB: Testing, adjusting, and balancing.

- Q. Terminal: A point where the controlled medium, such as fluid or energy, enters or leaves the distribution system.
- R. Test: A procedure to determine quantitative performance of systems or equipment.
- S. Testing, Adjusting, and Balancing Firm: The entity responsible for performing and reporting TAB procedures.

1.3 CODES AND STANDARDS (USE LATEST EDITIONS)

- A. ASHRAE 111: Practices for Measurement, Testing, Adjusting, and Balancing of Building Heating, Ventilation, Air-conditioning, and Refrigeration Systems.
- B. Associated Air Balance Council (AABC): National Standards for Total System Balance.
- C. ANSI S12.1: Physical Measurement of Sound
- D. National Environmental Balancing Bureau (NEBB): Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.
- E. National Environmental Balancing Bureau (NEBB): Procedural Standard for Fume Hood Performance Testing.
- F. National Environmental Balancing Bureau (NEBB): Procedural Standards for Certified Testing of Cleanrooms.
- G. National Environmental Balancing Bureau (NEBB): Procedural Standards for Measurement of Sound and Vibration.
- H. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): TAB Procedural Guide.
- I. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): HVAC Sound and Vibration Manual

1.4 QUALITY ASSURANCE

- A. Qualifications
 - 1. Testing agency shall be a certified member of AABC, NEBB, and/or TABB.
 - 2. Testing and Balancing shall be performed by a testing agency who specializes in testing, adjusting, and balancing of heating, ventilating, air-moving equipment, air-conditioning systems and hydronic systems and has a minimum of one year experience.
 - 3. Testing agency shall have successfully completed a minimum of five projects, similar in size and scope.
- B. Certifications - TAB Technician shall be certified by a nationally recognized certifying agency.
- C. Instrumentation Type, Quantity, and Accuracy: As described in AABC's "National Standards for Total System Balance," NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems," Section II, "Required Instrumentation for NEBB Certification," or the TABB Instrument List.
- D. Instrumentation Calibration: Calibrate instruments at least every six months or more frequently if required by instrument manufacturer.
 - 1. Keep an updated record of instrument calibration that indicates date of calibration and the name of party performing instrument calibration.

1.5 SUBMITTALS

- A. Preconstruction – Prior to construction provide the following in accordance with Specification 20 0500 – Basic Requirements for Mechanical, Plumbing, and Fire Suppression:
 - 1. Qualification Data: Within 30 days from Contractor’s Notice to Proceed, submit evidence that TAB firm and this Project’s TAB team members meet the qualifications specified in “Quality Assurance” Article.
 - 2. TAB Contract Document Examination Report: Within 30 days from Contractor’s Notice to Proceed.
 - 3. Strategies and Procedures Plan: Within 60 days from Contractor’s Notice to Proceed.
- B. During Construction – During construction provide and maintain the following in accordance with Specification 20 0500 – Basic Requirements for Mechanical, Plumbing, and Fire Suppression:
 - 1. Deficiency Report
 - 2. Preliminary TAB Reports
- C. Contract Closeout – At contract closeout provide the following in accordance with Specification 20 0500 – Basic Requirements for Mechanical, Plumbing, and Fire Suppression:
 - 1. Certified TAB Reports
 - 2. Warranties.

1.6 PROJECT CONDITIONS

- A. Full Owner Occupancy: Owner will occupy the site and existing building during entire TAB period. Cooperate with Owner during TAB operations to minimize conflicts with Owner’s operations.

1.7 COORDINATION

- A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, HVAC controls installers, and other mechanics to operate HVAC systems and equipment to support and assist TAB activities.
- B. Notice: Provide seven days’ advance notice for each test. Include scheduled test dates and times.
- C. Perform TAB after leakage and pressure tests on air distribution systems have been satisfactorily completed.
- D. Coordinate the following with the Temperature Control Contractor to verify calibration of installed equipment and devices:
 - 1. Field coordinate with the Temperature Control Contractor to validate airflow readings as measured by each fan airflow measuring station.
- E. Include a summary of the above results in the test and balance report.

1.8 WARRANTY

- A. Provide one of the following performance guarantees:
 - 1. AABC National Project Performance Guarantee
 - 2. NEBB Certificate of Conformance Certification
 - 3. TABB Quality Assurance Program Guarantee

- B. Guarantee shall include the following provisions:
 - 1. The certified TAB firm has tested and balanced systems according to the Contract Documents.
 - 2. Systems are balanced to optimum performance capabilities within design and installation limits.

PART 2 - PRODUCTS

2.1 ACCEPTABLE FIRMS

- A. Aero Building Solutions., Franklin Park, IL
- B. International Test & Balance, Northbrook, IL
- C. Superior Test & Balance, Inc., Algonquin, IL

2.2 TESTING SCOPE

- A. The following systems shall be tested in accordance with the procedures defined in Part 3 of this specification:
 - 1. Air systems

PART 3 - EXECUTION

3.1 GENERAL

- A. Provide sufficient time before completion date to complete balancing operations.
- B. Note changes made to the system during construction.
- C. Install required test holes complete with removable and replaceable plugs.
- D. Make and document revisions to controls, fan drives, and consult with equipment manufacturers as required to achieve the specified system's performance.
- E. Take and report testing and balancing measurements in inch-pound (IP) units.
- F. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to insulation Specifications for this Project.
- G. Mark equipment and balancing device settings with paint or other suitable, permanent identification material, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

3.2 EXAMINATION

- A. Examine the Contract Documents to become familiar with Project requirements and to review system designs for deficiencies that may prevent proper TAB.
- B. Examine approved submittal data of HVAC systems and equipment.
- C. Examine equipment performance data including fan and pump curves. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system. Calculate system effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from those presented when the equipment was performance tested at the factory. To

calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems,;" or in SMACNA's "HVAC Systems – Duct Design,“. Compare this data with the design data and installed conditions.

3.3 PREPARATION

- A. Prepare a Strategies and Procedures Plan that includes TAB strategies and step-by-step procedures as specified in Part 3 of these specifications.
- B. Prior to commencing the TAB verify the following conditions. If deficiencies are evident, submit Deficiency Report to Owner. Do not begin TAB until deficiencies have been remedied.
 - 1. Systems are started and operating in a safe and normal condition.
 - 2. Temperature control systems are installed, complete, and operable.
 - 3. Automatic and manual dampers are operable and fully open.
 - 4. Thermal overload protection is in place for fans, pumps, chillers, and other equipment.
 - 5. Startup air filters are removed.
 - 6. Final filters are clean and properly installed.
 - 7. Duct and fan systems are clean.
 - 8. Fans are rotating correctly.
 - 9. Fire and volume dampers are in place and open.
 - 10. Access doors are closed, and duct end caps are in place.
 - 11. Leak testing on duct system has been performed in accordance with Specification 23 3113 – Metal and Flexible Duct.
 - 12. Gauges and/or test ports are properly located for balancing.

3.4 TOLERANCES

- A. Air Systems
 - 1. Air Handling Systems: Adjust to within +10% of outlet total plus allowable leakage rate.
 - 2. Please note that differentials between supply and exhaust/return airflows, are based on existing unit operation.

3.5 AIR SYSTEMS PROCEDURE

- A. Perform testing and balancing procedures on each system according to any of the following:
 - 1. AABC National Standards for Total System Balance
 - 2. NEBB Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems
 - 3. SMACNA TAB Procedural Guide
 - 4. ASHRAE 111 Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems
- B. Minimum air procedures shall include the following:
 - 1. Test and adjust fan RPM to design requirements.
 - 2. Test and record motor full load nameplate rating and actual ampere draw.

3. Test and record system static pressures, fan suction, and discharge.
4. Adjust all main supply and return air duct to within tolerances of proper design CFM.
5. Make air velocity measurements in ducts by Pitot tube traverse across entire cross-sectional area of duct in accordance with SMACNA equal area method or Log Linear method.
6. Vary total system air quantities by adjustment of fan speeds. Provide drive changes recommendations. Vary branch air quantities by damper regulation.
7. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for loading of filters and coils.

3.6 OPERATING TEST

- A. After final adjustments and calibration, component performance check and system balancing have been completed, conduct a continuous 7-hour operating test during normal working hours from 9 a.m. to 4 p.m. in the presence of the Owner.
- B. The 7-hour test shall be continuous without any shutdowns. If any interruptions are required for malfunctions or readjustments, repeat the test from the start.
- C. The operating test, unless otherwise indicated, shall be conducted to verify the operation of the mechanical system and to demonstrate the performance of the total system

3.7 REPORTING

- A. TAB Contract Document Examination Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.
- B. Deficiency Report: Following examination of installed system, prior to balancing, submit report indicating system deficiencies that would prevent proper testing, adjusting, and balancing of systems and equipment to meet specified performance.
- C. Preliminary TAB Reports: Submit one copy of the preliminary testing, adjusting and balancing report without field data, including any drawings indicating air outlets, thermostats, and equipment identified to correspond with data sheets.
- D. Certified TAB Reports
 1. Submit two copies of reports prepared, as specified in this Section, on approved forms certified by TAB firm.
 2. General: Typewritten, or computer printout in letter-quality font, on standard bond paper, in three-ring binder, tabulated and divided into sections by tested and balanced systems.
 3. TAB Report Forms: Use standard forms from AABC, NEBB or TABB/SMACNA.
 4. Minimum Certified TAB Reports shall include the following:
 - a. Certification sheet in front of binder signed and sealed by the certified testing and balancing engineer.
 - b. List of instruments used for procedures, along with proof of calibration.
 - c. Certified TAB field data reports. This certification includes the following:

- (1) Review field data reports to validate accuracy of data and to prepare certified TAB reports.
 - (2) Certify that TAB team complied with approved TAB plan and the procedures specified and referenced in this Specification.
- d. Fan curves
 - e. Manufacturers' test data
 - f. Field test reports prepared by system and equipment installers
 - g. Other information relative to equipment performance, but do not include Shop Drawings and Product Data
 - h. Where specified, vibration and/or sound measurement report in accordance with the requirements of the current edition of the NEBB Procedural Standards for Measurement of Sound and Vibration.

3.8 INSPECTIONS

- A. Final Inspection:
 1. The Owner reserves the option to request at no extra charge a final inspection of the final TAB report.

3.9 ADDITIONAL TESTS

- A. Within 90 days of completing TAB, perform additional testing and balancing to verify that balanced conditions are being maintained throughout and to correct unusual conditions.
- B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional testing, inspecting, and adjusting during near-peak summer and winter conditions.

END OF SECTION

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SECTION 23 0900
BASIC TEMPERATURE CONTROL REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Scope
- B. Quality Assurance
- C. Specifications
- D. Project/Site Conditions
- E. Work by Subcontractors
- F. Coordinated Work
- G. Project Phasing
- H. Hazardous Materials
- I. Design Submittals
- J. Start-up and Testing
- K. Guarantee
- L. Closeout Submittals
- M. Record Documents
- N. Operating and Maintenance (O&M) Manuals
- O. Training

1.2 SCOPE

- A. The purpose of this project is to replace existing Woods fans with new fan wall and VFDs.
- B. The work is identified below:
 - 1. Control for the following systems:
 - a. Base Bid 1
 - (1) Fan wall
 - (2) Single VFD control panel provided by fan wall manufacturer
 - b. Additive Alternate Bid 1
 - (1) Dual VFD control panels, each controlling half of the fan wall fans
- C. Contractor must take special precautions at all times to prevent any damage to Owner's equipment or premises. This Contractor shall be liable for any damage.

1.3 QUALITY ASSURANCE

- A. Materials and equipment shall be the catalogued products of manufacturers regularly engaged in production and installation of automatic temperature control systems and shall be the manufacturer's latest standard design that complies with the specification requirements.

- B. All electronic equipment shall conform to the requirements of FCC Regulation, Part 15, Section 15, "Governing Radio Frequency Electromagnetic Interference" and be so labeled.
- C. The Contractor shall employ specialists in the field of Building Automation Systems including Programming, Engineering, Field Supervision and Installation. Specialists shall have a minimum of 5 years of experience with Building Automation Systems.
- D. The Contractor shall be responsible for all work fitting into place in a satisfactory, neat, workmanlike manner acceptable to the Owner and Engineer.

1.4 SPECIFICATIONS

- A. The Contract Documents are to be considered scope in coverage only and do not necessarily show the exact location and details of the work to be installed. It shall be the responsibility of the Contractor to furnish and install the work in conformity with the requirements of these Specifications, the applicable codes, regulations and standards, the best trade practices and to meet with the approval of Owner. If any departures from the Contract Drawings are deemed necessary by the Contractor, details of such departures and the reasons therefore shall be submitted immediately to Engineer for approval.
- B. If the drawings and/or specifications are in conflict with governing codes, the Contractor shall submit proposal with appropriate modifications to the project to meet code restrictions. If this specification and associated drawings exceed governing code requirements, this specification shall govern.
- C. If the drawings and specifications are in conflict with each other, the more stringent shall apply.

1.5 PROJECT/SITE CONDITIONS

- A. Before submitting Proposal, the Contractor shall visit and carefully examine the individual sites so as to familiarize himself with existing conditions, the amount of work required, the working hours and special auxiliary restrictions of the project requirements including storage and delivery of materials.
- B. The Contractor shall verify all conditions on the job which may affect the installation of the work, and shall familiarize himself with applicable local and state regulations. Any discrepancies or interferences shall be reported immediately to Engineer. Additions to the contract price will not be allowed when they are due to the failure of the Contractor to carefully inspect existing condition.
- C. The submission of a Proposal will be construed as evidence that such examination has been made. Later claims for labor, equipment or material required for difficulties encountered, which could have been foreseen had such examination and evaluation have been, will not be recognized.

1.6 WORK BY SUBCONTRACTORS

- A. All Subcontractors to the Contractor shall be approved by Owner.
- B. The Contractor shall be totally responsible for his work and all work by his Subcontractors.

1.7 COORDINATED WORK

- A. This Contractor shall cooperate with other contractors performing work on this project, or other projects at the site, as necessary to achieve a complete, neatly fitting installation for each condition. To that end, each Contractor shall consult the drawings and specifications, for all trades to determine nature and extent of other work.

1.8 PROJECT PHASING

- A. See Drawings

1.9 HAZARDOUS MATERIALS

- A. If hazardous materials including, but not limited to, asbestos, pollutants, or PCB are in any way suspected, inform Owner immediately and suspend work on that portion of the project.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.1 SUBMITTALS

- A. Refer to Division 01
- B. Submit all design submittals within 30 days after award of contract.
- C. Submittals and drawings shall be sufficient to:
 - 1. Show that the intent of the specification has been met.
 - 2. Provide a document for use by Owner showing all equipment incorporated into the system including both new and existing.
 - 3. Provide a document for use by Owner showing all equipment pneumatic and wiring connections of the system for both new and existing equipment.
- D. Items to be included in hardware drawings at minimum are:
 - 1. Include a complete bill of material of equipment used indicating quantity, manufacturer and model number and other relevant technical data.
 - 2. Include manufacturer's description and technical data, such as performance curves, product specification sheets and installation/maintenance instructions for the items listed in Division 23 Section 23 0901, "Temperature Control Hardware."
 - 3. Provide each electrically operated device with completely coded interconnection wiring diagrams. Show all termination and wiring numbers.
 - 4. Provide schematic wiring diagrams for each control panel. Show all terminations and wiring numbers.
 - 5. Provide schematic wiring diagrams for all field sensors and controllers.
 - 6. All schematic diagrams shall show both new and existing equipment for a complete control system schematic.
 - 7. Provide system schematic diagrams for air handling units. Schematics to indicate every monitored/controlled point associated with that system.
- E. Items to be included in software drawings at minimum are:
 - a. Include a complete description of the existing sequences of operation.
 - (1) Where sequences indicate, imply or suggest the use of "look-up" tables based on testing to be performed during the project, Contractor shall include such tables using

“best-guess” values as place-holders. Contractor shall use actual measured values as they become available.

- b. Provide a controller point list, including both inputs and outputs (I/O), indicating I/O point number, the controlled device associated with the I/O point and the location of the I/O device.
 - c. Provide schedules, lists or other documentation of all operation parameters.
 - d. The Contractor shall provide eight (8) hours of labor at Engineer’s office for the principal program writer to meet with Engineer to interpret/review line by line programming.
- F. Quantities of items submitted will not be reviewed by Engineer and are the responsibility of the Contractor.
- G. When manufacturer’s cut sheets apply to a product series rather than a specific product, the data specifically applicable to the project shall be highlighted or clearly indicated by other means. Clearly note exact models, options and accessories being provided. General catalogs will not be accepted as cut sheets to fulfill submittal requirements.
- H. Drawings and product data not bearing the approval stamp of the Contractor, showing Contractor has reviewed and approved, or containing deviations from the contract documents, will be returned to the Contractor for resubmittal for compliance with above requirements.
- I. Equipment furnished and installed which is not reviewed by Engineer and not conforming to the design concept of the project will have to be removed and replaced with acceptable equipment all at the cost of the Contractor.
- J. Corrections or changes indicated on drawings and product data shall not be considered as extra work order.
- K. Engineer’s checking and reviewing of drawings is a gratuitous assistance and in no way relieves the Contractor from responsibility for errors or omissions which may exist on the drawings. Whenever such error or omissions are discovered, they must be made good by the Contractor, without any additional cost to Owner, irrespective of any review by Engineer.
- L. Provide to Engineer any additional information or data which they deem necessary to determine compliance with these specifications or which they deem valuable in documenting the equipment to be installed.

3.2 START-UP AND TESTING

- A. Check out procedure must include provisions for technicians to specifically check off procedures or tests performed.
- B. At minimum, the following shall be included in the checkout procedure:
- 1. The Contractor shall test and verify proper operation for each control loop.
 - 2. Contractor shall test and verify that correct terminations/designations of I/O are in place for each input and output.
 - 3. Contractor shall test and verify that sensors are properly calibrated, operational, and are within the performance parameters established in this specification.
 - a. Contractor shall have onsite instrumentation to calibrate/verify all analog input sensing. Instruments shall themselves be properly calibrated and be of greater accuracy than the sensors installed.

4. Contractor shall test and verify onsite that operator interface menus and help screens are properly displayed, and that point names and designations are correct.
 5. Contractor shall test and verify communications between controllers.
- C. All tests shall be documented by the Contractor and certified, verifying that the tests have been performed and that all deficiencies have been corrected.
1. Contractor shall demonstrate on site to Engineer that each input and output operates as specified, control loops are tuned, alarms report as specified, failsafe modes are as specified, and other verification as requested by Engineer and/or Owner to demonstrate that the system has been checked by the Contractor.
 2. All testing must be performed and all deficiencies corrected to Engineer's and Owner's satisfaction.

3.3 GUARANTEE

- A. Workmanship and material for work specified shall be guaranteed free from defects for a period of twelve (12) months after final completion and acceptance by Owner of the new portions of the system. Any equipment herein described that is shown to be defective during the guarantee period shall be adjusted, repaired, or replaced at no charge to Owner.
- B. After the final inspection and demonstration, a punchlist of incomplete or unsatisfactory items will be developed by Engineer.
- C. The Contractor shall respond to the punchlist with a date by which all items will be completed/corrected.
- D. Upon completion of all punchlist items, the Contractor shall inform Engineer in writing of this fact. This date will serve as the tentative guarantee start date.
- E. At Owner's request, the Contractor shall visit the building to clarify for the operating personnel any questions as to the proper operation and maintenance of the system during the first year after final acceptance of system.

3.4 CLOSEOUT SUBMITTALS

- A. Refer to Division 01.

3.5 RECORD DOCUMENTS

- A. Refer to Division 01.

3.6 OPERATING AND MAINTENANCE (O & M) MANUALS

- A. Refer to Division 01.
- B. All drawings, applications software and other job documentation will become the property of Owner.

3.7 TRAINING

- A. Contractor shall provide a minimum of two (2) training sessions during the Contract period. Training shall be made available to Owner during multiple working shifts.
- B. The instructor(s) shall be competent and have full knowledge of the system installed and shall provide training specifically oriented to Owner's installed system.

- C. The instructor(s) shall utilize the operating and maintenance manual provided for the system as a reference manual during the training session. Each person attending the training session shall be provided with an O&M manual. At minimum, these sessions shall include the following:
1. Description of the overall control system configuration and physical layout, indicating location of all sensors and controlled devices.
 2. Description of all programs and program features (software).
 3. Description of the control strategies being utilized at the installation.
 4. Description of all key hardware components utilized in the system.
 5. Description of any changes made to existing electric controls which remain.

END OF SECTION

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**SECTION 23 0903
TEMPERATURE CONTROL CONDUIT**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Conduit
- B. Connectors
- C. Junction Boxes

1.2 SCOPE

- A. This section includes conduit requirements for use with wire, cable and pneumatic polyethylene tubing.

1.3 SUBMITTALS

Not Applicable

PART 2 - PRODUCTS

2.1 CONDUIT

- A. All wiring shall be installed in a complete conduit raceway system of a minimum trade size of ½". Conduit shall be installed continuous from terminal to terminal and shall be mechanically and electrically connected. The entire system shall be grounded.
 - 1. Exception: With permission of Owner, metallic surface raceway may be used in finished areas on masonry walls. All surface raceway in finished areas must be color matched to the existing finish within the limitations of standard manufactured colors. Receive authorization from Owner before using surface raceway.
 - 2. Exception: The conduit system shall be complete except that up to 12" of exposed Class 2, 3, or communications wiring may be used from the conduit system to an actuator. Wiring extending beyond the conduit system shall be protected by a plastic bushing at the end of the conduit.
- B. Conduit installed outside or exposed to moisture shall be rigid aluminum. Conduit in other areas shall be electric metallic tubing (EMT).
- C. Conduits installed in dry locations requiring flexible connections for adjustment or vibration isolation shall be provided with a 14" maximum length of flexible galvanized steel (Greenfield) conduit. Flexible conduit installed in wet locations and exterior locations shall be liquid-tight type.

2.2 CONNECTORS

- A. Couplings and connectors for use with rigid aluminum shall be the threaded type. Terminations shall be with double locknut and insulated bushings. Fittings installed outdoors shall be water tight.
- B. Couplings and connectors for electrical metallic tubing (EMT) shall be gland compression.

2.3 JUNCTION BOXES AND PULL BOXES

- A. Provide junction boxes and pull boxes of the proper size and shape.
- B. Junction and pull boxes shall be supported independently of the conduit system.

- C. Junction and pull boxes shall be of galvanized steel construction.
- D. Paint each junction box cover per specification Division 26 Section 26 0505, "Basic Electrical Materials and Methods." Mark cover using permanent marker to indicate that wiring enclosed is associated with the controls system.

PART 3 - EXECUTION

3.1 CONDUIT INSTALLATION

- A. Conduit shall not be smaller than the sizes indicated or specified, and where no size is indicated, the Contractor shall size the conduit in accordance with the requirements of the local/state Electrical Code for the number, size and type of wires indicated and specified for application, except that no conduit shall be less than ½" trade size.
- B. Where conduit enters panel boxes, pull boxes, outlet boxes or wireways, it shall be secured in place by galvanized locknut on the outside and galvanized locknut and bushing on the inside. Bushing shall be insulated throat type with ground lug. Care shall be taken to see that all conduit runs from a permanent and continuous ground return back to the panel ground connection point. All bushings shall be bonded to the junction box, outlet box, cabinet, etc. Where required, bonding jumpers shall be installed between conduit and boxes.
- C. Conduits for branch circuits shall be installed continuous between connections to outlets, boxes and cabinets and shall have a minimum possible number of bends or fittings. Bends shall be made with an approved hickey or conduit-bending machine and shall be smooth and even without flattening or flaking.
- D. Exposed conduit runs shall be run neatly and shall be parallel to the walls of the building.
- E. The actual installation of conduit shall be made in the field to clear all piping, ductwork, equipment fixtures, ceiling inserts, access doors, etc. Bends, turns, and pull boxes, as required, shall be provided in accordance with field conditions.
- F. Conduit ends shall be reamed and shall be thoroughly cleaned before installation. Conduit openings and boxes shall be plugged or covered as required to keep conduit clean during construction. All conduit shall be swabbed clear of obstructions before the pulling of wires.
- G. All threaded joints in rigid aluminum conduit shall be sealed with Thomas & Betts "Alum-Shield" compound on the male thread only.
- H. Conduit runs shall be securely fastened in place with approved straps, and hangers and supports from inserts set in the construction above. Vertical conduit shall be securely clamped to steel members and unistruts, and attached to the structure.
- I. Conduit shall not pierce or interfere with waterproofing, vapor barriers, damp-proofing, etc.
- J. Raceways run through foundation walls, basement slabs, or through any walls for floors that have vapor barriers, waterproofing, or any type of damp-proofing, shall be sealed by use of special wall and floor entrance seals designed for the purpose. Drawings of the proposed seals and clamping arrangements shall be submitted for approval.
- K. Conduits passing from the building exterior to interior or passing between conditioned and non-conditioned spaces shall be sealed to prevent condensation in the conduit.
- L. Conduits crossing building expansion joints shall be provided with expansion fittings and flexible grounded bonds bypassing the fittings to insure ground continuity.

- M. All conduit shall be supported with fasteners designed for the application and must be attached to the building structure and shall not be supported from other conduit, pipes, ductwork, ceiling suspension members or equipment. Existing pipe hangers for multiple conduits with spare capacity may be used.
 - 1. Exception: When conduit is required to terminate at a sensor or control point on ductwork, the conduit may be fastened to the ductwork. This is the only condition in which conduit is allowed to be fastened to ductwork.
 - 2. Note: Perforated metal strap and tie wire are prohibited.
- N. Existing conduit which is in place and has additional wire carrying capacity due to existing wiring being removed or due to original spare capacity may be used for new wiring if the conduit installation meets this Temperature Control conduit specification.
- O. All openings for conduit passing through masonry walls or floor shall be core drilled by this Contractor. Core holes shall be sealed as follows:
 - 1. For the conduits penetrating floor or fire walls, the Contractor shall provide fire stopping equivalent to the construction penetrated.
 - 2. Where conduit passes through floor or exterior walls, caulk at both sides to insure waterproofing around conduit.
 - 3. Where conduit penetrates walls separating quiet areas such as offices from noisy areas such as equipment rooms, the opening around the conduit shall be filled with fiberglass insulation and sealed.

3.2 JUNCTION BOX INSTALLATION

- A. All outlets shall be installed in accessible locations and none shall be installed above ducts, behind furring or in other similar locations. Any outlet designated as providing power for particular piece of equipment shall be accessible for disconnection with said unit in place.

END OF SECTION

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**SECTION 23 0904
TEMPERATURE CONTROL WIRING**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Wire
- B. Cable

1.2 SCOPE

- A. Power wiring, Class 1, 2, or 3 wiring, and communications wiring required for satisfactory installation and operation of all equipment specified under temperature control shall be furnished and installed by this contractor.
- B. Wiring shall be installed in accordance to wiring specification found in this section.
- C. All wiring shall be UL listed and installed in accordance with applicable electrical codes and shall comply with equipment manufacturer's recommendations.

Note: When specified materials or installation methods exceed applicable electrical codes and equipment manufacturer's recommendations, this specification shall govern.

1.3 SUBMITTALS

- A. Submit data and samples of the following:
 - 1. Analog Cable
 - 2. Other low voltage signal cable

PART 2 - PRODUCTS

2.1 WIRE AND CABLE

- A. All wires shall be copper and shall meet the minimum wire size and insulation class listed.

WIRE CLASS	MINIMUM WIRE SIZE	MINIMUM INSULATION CLASS
Power	12 Gauge	600 Volt
Class 1	14 Gauge Stranded	600 Volt
Class 2	18 Gauge Stranded	300 Volt
Class 3	18 Gauge Stranded	300 Volt
Communications	Per Manufacturer	Per Manufacturer

- B. 120V power circuit wiring shall be #12 AWG. Home runs longer than 100 feet shall be #10 AWG.
- C. 24V control power circuit wiring and all wiring to flow switches and relays shall be #14 AWG. Runs greater than 200 feet in length shall be #12 AWG.
- D. Use twisted shielded pair, insulated and jacketed cable, #18 AWG minimum, for wiring to sensors (temperature, humidity, etc.). All sensor wiring shall have a 100% grounded shield.
- E. Network communications wiring shall be in accordance with manufacturer's specifications.

- F. Use THHN wires for power circuit wiring and all control wiring in dry locations; use THWN wires for wet locations.
- G. Conductors shall be continuous from outlet to outlet and no splices or connections shall be made, except within outlet boxes, junction boxes or cabinets.
- H. Permanent wiring shall not be pulled into conduits or raceways until permission is granted by Owner.
- I. Where the space above a ceiling is a supply or return air plenum, the wiring therein shall be plenum rated.

PART 3 - EXECUTION

3.1 WIRING

- A. All sensor wiring shall use crimped or soldered connections; wire nuts are not allowed.
- B. Sensor wiring shall be continuous containing no splices between the digital controller and the field sensor.
- C. Identify all control/signal wires with labeling tape using either words, letters or numbers that can be exactly cross-referenced with as-built drawings.

3.2 INSTALLATION

- A. Wires shall be kept a minimum of 3" from hot water piping, steam piping, condensate piping or any other hot surfaces.
- B. The Contractor shall provide a separate insulated green ground wire inside each power branch circuit conduit. Connect one end of the ground wire to the ground bus or ground terminal in the panel board. Connect the other end of the ground wire to the grounding lug in equipment being served. Provide and install a grounding lug in equipment being served if no grounding lug exists.
- C. Identify all temperature control raceways with labels stating "Control System Wiring." Typed (not handwritten) labels shall be affixed to the covers of all junction boxes and pull boxes.

3.3 RACEWAY SYSTEM

- A. Power and Class 1 wiring may be run in the same conduit. Class 2 and 3 wiring and communications wiring may be run in the same conduit. Power and Class 1 may not be run together with Class 2, Class 3, or communications wiring.
- B. No sensor wiring shall be run in the same conduit with power or Class 1 wiring.
- C. Where different wiring classes terminate within the same enclosures, maintain clearances and install barriers per National Electric Code.
- D. Pneumatic tubing may not be run in wiring conduit.
- E. Wiring within air handling units shall be in a complete conduit system.

END OF SECTION

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**SECTION 23 0906
TEMPERATURE CONTROL DEMOLITION**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Miscellaneous Existing Controls
- B. Demolition of Controls

1.2 SCOPE

- A. Demolition of DDC and pneumatic control panels, devices and associated wiring, tubing and conduit for mechanical systems specified in this section.

1.3 SUBMITTALS

Not Applicable

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.1 MISCELLANEOUS EXISTING CONTROLS

- A. Existing control equipment that is to remain is to be calibrated/adjusted for proper operation.
- B. Any equipment found to be defective and requiring replacement shall be brought to the attention of Owner. Owner will be responsible for repairs to same.
- C. Existing control equipment that is to remain shall be relocated to a new enclosure.
- D. The following devices and sensors may be reused provided they meet the requirements of Division 23 Section 23 0901, "Temperature Control Hardware":
 - 1. Fan status (differential pressure - air)

3.2 DEMOLITION

- A. Demolition of the existing control systems shall be limited to those systems in which the temperature controls are to be replaced by this Project.
- B. Demolition shall include removal of all existing direct digital controls and pneumatic controls not specifically identified to remain. This includes but is not limited to:
 - 1. Field control panels
 - 2. Temperature control panels
 - 3. Pneumatic/electric controls associated with mechanical systems equipment
 - 4. Pneumatic tubing
 - 5. Electric devices, wiring and conduit
 - a. **Note:** Abandoned tubing and wiring, including conduit, shall be removed completely except where tubing or conduit are installed in inaccessible locations, such as within walls or floors. All tubing ends shall be capped. Above drop ceilings is considered to be

inaccessible except that wiring and pneumatic tubing within or outside conduit is to be pulled out. Conduit is to remain in place.

- C. Demolition of temperature control panels includes removal of all associated wiring.
- D. Owner will inform the Contractor of any equipment to be removed that will remain the property of Owner. All other equipment removed shall be disposed of by the Contractor.
- E. The Contractor shall insure that removed controls do not compromise the operation of the existing controls which remain.
- F. The Contractor shall be required to make minor modifications to the existing control system such that when a portion of a control system is removed, the remaining system is left in a neat and orderly condition similar to the original installation.
 - 1. It is the intent of this project to eliminate existing DDC pneumatic control panels where much of the internal equipment is no longer needed. Consolidate equipment that is to remain into one new field panel.
 - 2. Caution is necessary in this consolidation/clean-up mode, since there is potential for existing wiring which passes through these panels and does not terminate at the panel.
 - a. Where control panels, once so demolished of controls, devices, etc., render the remaining function of the panel to be a junction box or pull box, Contractor shall so remove the control panel and install a junction box and necessary conduit, where allowed by code.
 - b. Contractor shall maintain all fire and smoke control system interlocks on units where such exists.
- G. Patch and seal any holes left in ductwork, walls, etc. after the existing controls have been removed. A stainless or Owner-approved equal cover plate may be used in finished spaces.
- H. Temporary work necessary to maintain air flow, space temperature and relative humidity during demolition of existing controls shall be provided by this Contractor.

END OF SECTION

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SECTION 23 3113
METAL AND FLEXIBLE DUCT

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Duct and duct-associated materials and procedures in this section include:
 - 1. Sheet metal materials
 - 2. Single-wall rectangular ducts and fittings
 - 3. Sealants and gaskets
- B. Services provided
 - 1. Duct leak testing
 - 2. Removal of existing duct lining
 - 3. Duct cleaning

1.2 DEFINITIONS

- A. Duct Size: Duct sizes indicated herein or on associated drawings shall be the inside clear dimensions of actual air path for both unlined and lined ducts.
- B. Pressure Class: A "SMACNA - HVAC Duct Construction Standards, Metal and Flexible" pressure classification system designating static pressure values (in inches w.g.) equal to the maximum operating pressure to which the ductwork can safely be subjected.

1.3 CODES AND STANDARDS (USE LATEST EDITIONS)

- A. American Society for Testing Materials (ASTM)
 - 1. ASTM A 36/A 36M: Specification for Carbon Structural Steel
 - 2. ASTM A 366/A 366M: Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality
 - 3. ASTM A 480/A 480M: Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
 - 4. ASTM A 653/A 653M: Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 5. ASTM B 209: Specification for Aluminum and Aluminum-Alloy Sheet and Plate
 - 6. ASTM C 203: Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation
 - 7. ASTM C209: Standard Test Methods for Cellulosic Fiber Insulating Board
 - 8. ASTM C 411: Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation
 - 9. ASTM C 534: Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form
 - 10. ASTM C 916: Specification for Adhesives for Duct Thermal Insulation
 - 11. ASTM C 920: Specification for Elastomeric Joint Sealants

12. ASTM E 84: Test Method for Surface Burning Characteristics of Building Materials
- B. National Fire Protection Association (NFPA)
 1. NFPA 90A: Installation of Air Conditioning and Ventilating Systems
 2. NFPA 90B: Installation of Warm Air Heating and Air Conditioning Systems
 3. NFPA 96: Ventilation Control and Fire Protection of Commercial Cooking Operations
 4. NFPA 255: Standard Method of Test of Surface Burning Characteristics of Building Materials
 - C. North American Insulation Manufacturers Association (NAIMA)
 1. NAIMA AH124: Fibrous Glass Duct Liner Standard
 - D. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)
 1. SMACNA: Duct Cleanliness for New Construction
 2. SMACNA: HVAC Air Duct Leakage Test Manual
 3. SMACNA: HVAC Duct Construction Standards - Metal and Flexible (excluding all amendments and proposed revisions)
 4. SMACNA: IAQ Guidelines for Occupied Buildings Under Construction
 - E. Underwriters Laboratory
 1. UL® 94: Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances
 2. UL® 181: Factory-Made Air Ducts and Air Connectors
 3. UL® 723: Test for Surface Burning Characteristics of Building Materials

1.4 QUALITY ASSURANCE

- A. Construct ductwork to NFPA 90A standards.
- B. Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall, at a minimum, comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," excluding all amendments and proposed revisions, and performance requirements and design criteria indicated.
 1. All further references to conformance with the requirements of SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" shall always mean with the exclusion of all amendments and proposed revisions.
 2. Where the requirements of this specification exceed the requirements of the SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," the specifications shall govern.
- C. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.
- D. Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1.5 SUBMITTALS

- A. Preconstruction – Prior to construction provide the following in accordance with Specification 20 0500 – Basic Requirements for Mechanical, Plumbing, and Fire Suppression:

1. Product Data: Submit for each type of the following products:
 - a. Liners and adhesives.
 - b. Sealants and gaskets: submit manufacturer's data sheets including performance data, pressure ratings, surface burning characteristic and installation instruction.
2. Shop Drawings: For all new duct systems submit layout drawings at $\frac{1}{4}'' = 1'-0''$ scale in both hard-copy and AutoCAD compatible format. Shop drawings shall include, but not be limited to:
 - a. Metal and flexible ductwork and fittings including both factory- and shop-fabricated
 - b. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work
 - c. Duct layout indicating sizes, configuration, liner material, and static-pressure classes
 - d. Elevation of ducts
 - e. Dimensions of main duct runs from building grid lines
 - f. Fittings
 - g. Reinforcement and spacing
 - h. Seam and joint construction
 - i. Penetrations through fire-rated and other partitions
 - j. Equipment installation based on equipment being used on Project
 - k. Locations for duct accessories including dampers, turning vanes, and access doors and panels
 - l. Hangers and supports, including methods for duct and building attachment, and vibration isolation
 - m. Provide detail or schedule of:
 - (1) Sheet metal thicknesses
 - (2) Joint and seam construction and sealing
 - (3) Reinforcement details and spacing
 - (4) Materials, fabrication, assembly, and spacing of hangers and supports
 - n. Indicate all duct mounted equipment including fan coil units, reheat coils, terminal units, and humidifiers and indicate:
 - (1) Elevations, sections, details of components, manifolds
 - (2) Support types, locations, and weight on each support
 - (3) Required clearances
 - o. Shop drawings shall show other building and building system components for coordination purposes. Input from other installers shall be obtained. Any proposed changes to duct layout required for coordination purposes shall be indicated. Coordination items shown shall include but not be limited to:
 - (1) Any pipe (e.g., sprinkler, heating hot water, chilled water, plumbing pipes, roof drawings, etc.) in vicinity of duct
 - (2) Electrical duct banks and conduit
 - (3) Structural members including structural members to which duct will be attached
 - (4) Items penetrating finished ceiling including the following:
 - (a) Lighting fixtures
 - (b) Air outlets and inlets

- (c) Speakers
 - (d) Sprinklers
 - (e) Access panels
- 3. Duct Testing Plan: Submit duct pressure testing plan with duct shop drawings, including list of ducts to be tested and duct testing schedule. Plan shall be color coded indicating areas to be tested in each phase of testing.
 - a. Notify engineer and owner of duct leakage testing schedule. Engineer shall be present at first duct leakage test per system.
- 4. Manufacturer's installation and operating manuals.
- 5. Welding Certificates
- B. During Construction – During construction provide and maintain the following in accordance with Specification 20 0500 – Basic Requirements for Mechanical, Plumbing, and Fire Suppression:
 - 1. Site Record Drawings - Maintain a set of drawings on site during construction showing the exact routing and location of duct systems being installed. The drawing shall be updated neatly by hand on a daily basis and account for routing modifications made in the field. Contractor shall use these drawing as a basis for generating the project as-built drawings.
- C. Contract Closeout – At contract closeout provide the following in accordance with Specification 20 0500 – Basic Requirements for Mechanical, Plumbing, and Fire Suppression:
 - 1. Operation and Maintenance Data including:
 - a. Product data
 - b. Installation instructions
 - c. Assembly views
 - d. Replacement parts list
 - e. Maintenance and operation instructions
 - 2. As-Built Drawings
 - a. Upon completion of project, Contractor shall furnish as-built drawings showing in scale the exact routing and locations of all newly installed duct systems. Submit in both hard-copy and electronic AutoCAD format.
 - 3. Test Reports
 - a. Duct Testing Reports: Submit documentation of duct performance testing and submit performance testing result reports within two weeks of testing.
 - (1) Contractor shall be responsible for any corrective action required due to a failed duct leakage test.
 - 4. Warranties

1.6 DELIVERY, STORAGE AND HANDLING

- A. Protect new duct interiors from moisture, construction debris and dust, and other foreign materials. If inside of new duct becomes dirty, Contractor shall clean duct per Duct Cleaning specifications.
- B. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Intermediate Level.

1.7 WARRANTY

- A. One year warranty on products and complete installation commencing at the time of Substantial Completion.

PART 2 - PRODUCTS

2.1 SHEET METAL MATERIALS

- A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
1. Galvanized Sheet Steel: Comply with ASTM A 653. Lock forming quality with G-90 galvanized coating designation (not less than 1.25 oz. of zinc on each side of each square foot of sheet).
 2. Paint Grip Steel; mill-phosphatized "Paintgrip" or "Zincgrip" finish suitable for field painting.
 3. Minimum ducts gauges shall be in accordance with the following tables. This table shall be used in conjunction with SMACNA table for application of appropriate reinforcement in accordance with proper pressure class.

MINIMUM GALVANIZED STEEL RECTANGULAR DUCT GAUGE WITHOUT REINFORCEMENT					
DUCT DIMENSION (IN.)	1" W.G.	2" W.G.	3" W.G.	4" W.G.	6" W.G.
8 and under	26	26	24	24	24
9 - 10	26	26	24	22	24
11 - 12	26	26	24	22	20
13 - 14	26	24	22	20	20
15 - 16	26	24	22	20	18
17 - 18	24	22	20	18	18
19 - 20	24	20	18	18	16
21 - 22	22	18	18	18	16
23 - 24	22	18	18	18	16
25 - 26	20	18	18	16	
27 - 28	18	18	18	16	
29 - 30	18	18	18	16	
31 - 36	18	16	16		
37 - 42	16				
43 - 48	16				
49 - 54					
55 - 60					
61 - 72					
73 - 84					
85 - 96					
97 - 108					
109 - 120					

REINFORCEMENT REQUIRED
REFER TO SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE

MINIMUM GALVANIZED STEEL ROUND DUCT GAUGE WITHOUT REINFORCEMENT

Duct Diameter (in.)	+10" w.g. Long Seam	+10" w.g. Spiral Seam	-2" w.g. Long Seam	-2" w.g. Spiral Seam	-4" w.g. Long Seam	-4" w.g. Spiral Seam	-6" w.g. Long Seam	-6" w.g. Spiral Seam
4	28	28	28	28	28	28	28	28
6	28	28	28	28	28	28	28	28
8	28	28	28	28	28	28	26	28
10	28	28	28	28	26	28	24	26
12	28	28	26	28	24	26	24	24
14	28	28	24	28	22	24	22	24
16	26	26	24	26	22	24	20	22
18	26	26	22	24	20	22	20	22
20	24	26	22	24	20	22	18	20
22	24	26	22	22	18	20	18	20
24	24	26	20	22	18	20	18	18
30	22	24	18	20	16	18	16	18
36	22	24	16	18		16		16
42	22	24	16	18		16		
48	20	22		16				
54	20	22		16				
60	20	22						
66	18	22						
72	18	20						
78	18	20						
84	18	20						
90	18	20						
96	18	20						

REINFORCEMENT REQUIRED
REFER TO SMACNA HVAC DUCT
CONSTRUCTION STANDARDS - METAL AND FLEXIBLE

2.2 SINGLE WALL RECTANGULAR DUCTS AND FITTINGS (SHOP AND FACTORY FABRICATED)

- A. Acceptable Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Lindab Inc.
 - 2. McGill AirFlow LLC.
 - 3. SEMCO Inc.
 - 4. Sheet Metal Connectors, Inc.
 - 5. Shop fabricated duct is acceptable for ducts with a pressures class rating of 6" w.g. or less provided compliance with the requirements herein are met.
- B. General Fabrication Requirements
 - 1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
 - 2. Comply with SMACNA's "Industrial Duct Construction Standards" where indicated.
- C. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-4, "Transverse (Girth) Joints," for static-pressure class,

applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" except as otherwise noted.

1. No duct shall be constructed to less than 2" w.g.
- D. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-5, "Longitudinal Seams - Rectangular Ducts," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," except as otherwise noted:
 1. Button Punch Snap Lock is not acceptable.
- E. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 2, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," except as otherwise noted.

2.3 SEALANT AND GASKETS

- A. Acceptable Manufacturers for Duct Sealant:
 1. Hardcast
 2. United McGill
 3. Ductmate
- B. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
- C. Duct Sealant:
 1. Water-based non hardening, water resistant, mold and mildew resistant sealant classified compounded specifically for sealing joints and seams in ductwork.
 - a. Maximum Static-Pressure Class: 10" w.g., positive and negative.
 - b. Service: Indoor or outdoor.
 - c. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets for specific applications.
 2. Duct tapes are not allowed.
- D. Flanged Joint Sealant: Comply with ASTM C 920. General: Single-component, acid-curing, silicone, electrometric. Type S, Grade NS, Class 25, Use O.
- E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.
 1. Gaskets used in chemical, laboratory, or process exhaust duct systems shall be suitable for exposure to substances in the air stream. Contractor shall verify the compatibility with Engineer prior to installation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General

1. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Where interferences develop in field, offset or reroute ductwork as required for clearing such interference.
2. Contractor shall modify specified duct sizes as required to fit. Modified duct size shall have cross-sectional area and pressure drop equivalent to that of the specified duct size.
3. All ducts shall be airtight and free from pulsation and vibration at normal operating conditions.
4. Contractor shall submit sheet metal shop drawings to the Test and Balance Contractor for review, and provide any additional volume dampers that the Test and Balancing Contractor needs to perform final balancing.
5. Install round ducts in maximum practical lengths.
6. Install ducts with fewest possible joints.
7. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
8. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
9. Install ducts with a minimum clearance of 1", plus allowance for insulation thickness.
10. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
11. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.
12. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1½".
13. Where ducts pass through fire and smoke rated interior partitions and exterior walls, install fire, smoke, and/or combination fire/smoke dampers. Contractor shall obtain a copy of architectural drawings showing the fire and smoke rated partitions and exterior walls at the time of bid and provide the appropriate damper (at all ducts penetrating fire and smoke rated partitions and walls whether shown on mechanical plans or not). Comply with requirements in Division 23 Section "Ductwork Accessories" for fire and smoke dampers.
14. Provide openings in ducts where required to accommodate thermometers and controllers. Provide pitot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ducts, install insulation material inside a metal ring.
15. Fabricate continuously welded medium and high pressure round duct fittings two gauges heavier than duct gauges indicated in SMACNA Standard. Joints shall be minimum 4" cemented slip joint, brazed or electric welded. Prime coat welded joints.
16. Where ducts of different metals meet, joint shall use a gasket, seal or compound to prevent the two different metals from coming in contact.
17. Galvanized surfaces altered or damaged (including the damage due to welding) shall be painted with a galvanized paint.

18. For paint grip steel ducts, place identification stickers in side ducts off of the surface to be painted.
19. Gaskets shall not protrude into airstream.

END OF SECTION

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SECTION 23 3400
FAN MODULES WITH DIRECT DRIVE PLENUM FANS AND VFD CONTROL PANEL

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Product(s) in this specifications:
 - 1. Fan Modules with Direct Drive Plenum Fans
- B. Products/materials provided under this section but specified under another section:
 - 1. Section 20 0500 – Basic Requirements for Mechanical, Plumbing, and Fire Suppression
 - 2. Section 20 0513 – Motor Requirements for Mechanical, Plumbing, and Fire Suppression Equipment
 - 3. Section 20 2923 – Variable Frequency Drives for Mechanical, Plumbing, and Fire Suppression
 - 4. Section 23 0100 – Common Work Requirements for Mechanical
 - 5. Section 23 0593 – Testing, Adjusting, and Balancing for HVAC
 - 6. Section 23 0903 – Temperature Control Conduit
 - 7. Section 23 0904 – Temperature Control Wiring
 - 8. Section 23 7313 – Modular Indoor Central Station Air Handling Units
- C. Services provided:
 - 1. Fan operational test
 - 2. Manufacturer's field services

1.2 CODES AND STANDARDS (USE LATEST EDITION)

- A. Air-Conditioning Heating, & Refrigeration Institute (AHRI)
 - 1. AHRI 260: Sound Rating of Ducted Air Moving and Conditioning Equipment
- B. Air Movement and Control Association International, Inc. (AMCA)
 - 1. AMCA 99-10: Standards Handbook
 - 2. ANSI/AMCA 204 – Balance Quality and Vibration Levels for Fans
 - 3. AMCA 210: Laboratory Methods of Testing Fans for Aerodynamic Performance Rating (ANSI)
 - 4. AMCA 300: Reverberant Room Method for Sound Testing of Fans
 - 5. AMCA 301: Methods for Calculating Fan Sound Ratings from Laboratory Test Data
 - 6. AMCA 610: Laboratory Methods of Testing Airflow Measurement Stations for Performance Rating
 - 7. AMCA 611: Certified Ratings Program – Airflow Measurement Performance
- C. American National Standards Institute (ANSI)/American Bearing Manufacturers Association (ABMA)
 - 1. ANSI/ABMA 9: Load Ratings and Fatigue Life for Ball Bearings
 - 2. ANSI/ABMA 11: Load Ratings and Fatigue Life for Roller Bearings

- D. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
 - 1. ASHRAE/IESNA 90.1: Energy Standard for Buildings except Low-Rise Residential Buildings (ANSI)
- E. American Society for Testing and Materials (ASTM) International
 - 1. ASTM A 666: Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar
 - 2. ASTM B117: Standard Practice for Operation Salt Spray Apparatus
 - 3. ASTM C 916: Specification for Adhesives for Duct Thermal Insulation
- F. National Electrical Manufacturers Association (NEMA)
 - 1. NEMA AB 1: Molded Case Circuit Breakers, Molded Case Switches, and Circuit-Breaker Enclosures
 - 2. NEMA ICS 2: Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC
 - 3. NEMA KS 1: Enclosures and Miscellaneous Distribution Equipment Switches (600 Volts Maximum)
 - 4. NEMA MG 1: Motors and Generators
- G. National Fire Protection Association (NFPA)
 - 1. NFPA 70-2005: National Electrical Code
 - 2. NFPA 90A-2002: Installation of Air Conditioning and Ventilating Systems
- H. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)
 - 1. SMACNA HVAC Duct Construction Standards. 1995.
- I. Underwriters Laboratories Inc. (UL)
 - 1. UL 181: Factory-Made Air Ducts and Air Connectors
 - 2. UL 1995: Heating and Cooling Equipment

1.3 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum five years documented experience.
- B. AHRI Certification: Fan modules utilizing single fans shall be rated and certified in accordance with AHRI Standard.
- C. Damper pressure drop ratings shall be based on tests and procedures performed in accordance with AMCA 500.
- D. Fan Performance Rating: Factory test fan performance for airflow, pressure, power, air density, rotation speed, and efficiency. Rate performance according to AMCA 210, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating." Fan shall bear AMCA Certified Rating Seal.
- E. Fan 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.

- F. Equipment and motor efficiencies shall meet or exceed the requirements of ASHRAE/IESNA90.1-2004.
- G. Airflow measuring station: Certify airflow measurement station performance in accordance with AMCA 611.

1.4 SUBMITTALS

- A. Fan manufacturer shall provide the following information with each shop drawing/product data submission:
 - 1. All electrical, piping, and ductwork requirements, including sizes, connection locations, and connection method recommendations.
 - 2. Each component of the unit shall be identified and mechanical specifications shall be provided for unit and accessories describing construction, components, and options.
 - 3. All performance data, including capacities and airside pressure drops, for components.
 - 4. Fan curves shall be provided for fans with the design operating points indicated. Data shall be corrected to actual operating conditions, temperatures, and altitudes.
 - 5. An electrical MCA – MOP schedule shall be provided for each electrical circuit to which field power must be supplied. Schedule to detail equipment tag, circuit description, voltage/phase/hertz, MCA, and MOP.
 - 6. Fan manufacturer shall provide appropriate sets of submittals and shall submit electronic copies of IOM.
 - 7. Fan manufacturer shall list and exceptions to the specification.
 - 8. Fan Data:
 - a. Unit dimensions and weight
 - b. Required clearances
 - c. Cabinet material, metal thickness, finishes, insulation, and accessories
 - d. Fans
 - (1) Certified fan-performance curves with system operating conditions indicated. Performance shall be for all fans operating together as an array. Single fan performance only will not be acceptable.
 - (2) Certified fan-sound power ratings for fan inlet, outlet and casing radiated at the specified capacity
 - (3) Fan construction and accessories
 - (4) Motor ratings, electrical characteristics, and motor accessories
 - 9. Damper Data:
 - (1) Leakage
 - (2) Pressure drop
 - (3) Maximum pressure
- B. Manufacturer's Installation Instructions
 - 1. Indicate specific installation instructions per the manufacturer of all products, and indicate how the system will be assembled. Instructions should include:

- a. Electrical: Requirements for power supply wiring; wiring diagrams for interlock and control wiring (clearly indicating factory installed and field installed wiring).
 - b. Equipment: Provide complete instructions for field disassembly and reassembly of fans.
- C. Operation and Maintenance Data
1. Include instructions for lubrication of motors, if required, as well as motor and drive replacement, spare parts lists, wiring diagrams and assembly drawings.

1.5 REGULATORY REQUIREMENTS

- A. Agency Listings and Certifications
1. Unit shall be manufactured to conform to UL 1995 and shall be listed by either UL/CUL or ETL. Units shall be provided with listing agency label affixed to unit. In the event the unit is not UL/CUL or ETL approved, the contractor shall, at his/her expense, provide for a field inspection by a UL/CUL or ETL representative to verify conformance. If necessary, contractor shall perform modifications to the unit to comply with UL/CUL or ETL as directed by the representative, at no additional expense to the Owner.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Protect equipment such as motors and fans from the weather and moisture by providing weather-proof coverings. Protect while in transit and while stored on the project site.
- B. Pack, protect and secure loose shipped items.
- C. Protect equipment such as fans, dampers, etc. from dirt and debris.
- D. Do not operate units for any purpose, temporary or permanent, until ductwork is clean, filters are in place, bearings lubricated and fans have been test run under observation.
- E. Follow manufactures' written instructions for rigging, off-loading and use of rigging tools such as spreaders bars, forklifts, come-alongs and shackles.

1.7 WARRANTY

- A. Fan module manufacturer shall provide, at no additional cost, a standard parts warranty that covers a period of one year from unit start-up. This warrants that all products are free from defects in material and workmanship and shall meet the capacities and ratings set forth in the equipment manufacturer's catalog and bulletins.

PART 2 - PRODUCTS

2.1 FAN, DRIVE AND MOTOR SECTION

- A. Manufacturers
1. Approved manufacturers shall be:
 - a. AcoustiFLO
 - b. Nortek Air Solutions or subbrands
 - c. Trane/Thybar with New York Blower Fans
- B. General Requirements
1. Fans shall be of AMCA Class II or III as required to provide the airflow and pressure specified.

2. Fans shall be constructed of galvanized steel with a baked enamel finish.
3. Fan and Drive Assemblies: Statically and dynamically balanced and designed for continuous operation at maximum-rated fan speed and motor horsepower. Complete fan assembly shall be dynamically balanced to minimum grade of ANSI/AMCA 210 at design operating speed using contract drive and motor.
 - a. Shafts: Designed for continuous operation at maximum-rated fan speed and motor horsepower, and with field-adjustable alignment.
 - (1) Turned, ground, and polished hot-rolled steel with keyway. Ship with a protective coating of lubricating oil.
 - (2) Fan shafts shall be sized so that the first critical speed is at least 125% of the maximum operating speed for each pressure class.
4. Fan Mounting and Vibration Isolation: Fans shall be factory mounted with spring or neoprene vibration isolation devices as per ASHRAE recommendations.
5. Balancing: Fans that are selected with inverter balancing shall first be dynamically balanced at design RPM. Fans will then be checked in factory from 25% to 100% of design RPM to ensure operation across entire range is within vibration tolerance specifications, and that there are no resonant frequency issues throughout this operating range. Inverter balancing requiring lockout frequencies inputted into VFD in order to bypass resonant frequencies is not acceptable.
6. Access: Access panels shall be provided in all fan modules to allow easy access to fans, isolators, motors, and bearings as required for cleaning, inspection, and maintenance. Access panels shall be fully removable without the use of specialized tools to allow complete access of interior surfaces.

C. Fan Type

1. Fans shall be aluminum, direct drive, arrangement IV plenum type with airfoil wheel, class II or III as required to meet flow and pressure requirements. Fan shall have smooth curved inlet flange, heavy back plate die formed hollow airfoil shaped blades continuously welded at tip flange and back plate.
2. Refer to Fan Schedule and Fan Inlet And Outlet Sound Power Schedule on drawings and this specification for performance requirements.
3. Fan(s) shall be factory mounted on a structural steel platform/assembly which shall be internally isolated from the outer casing with factory installed vibration isolators.
4. Provide permanently lubricated bearings.
5. Provide factory ceiling mounted I-beam for removal of fan motors.
6. The quantity of fans, motors and variable frequency drives shall match what is shown on the plans and scheduled.
7. The fan array shall consist of multiple, direct driven, arrangement 4 plenum fans constructed per AMCA requirements for the duty specified. The fan array shall be selected to operate at a system total static pressure that does not exceed 90% of the specified fan's peak static pressure producing capability at the specified fan/motor speed. All motors shall be standard pedestal mounted type, TEFC, T-frame motors. All motors shall include isolated bearings or shaft grounding to prevent bearing damage associated with stray electrical current. Each fan and

motor assembly shall be statically and dynamically balanced to meet AMCA standard 204-96, category BV-5, to meet or exceed Grade 1.0 residual unbalance.

8. Wheel and Inlet: Airfoil Wheel: Class III aluminum construction with smooth curved inlet flange, heavy back plate die formed hollow airfoil shaped blades continuously welded at tip flange and back plate.
 - a. Inlet cone of each fan shall include inlet piezometer ring for airflow measurement.
9. The fan array shall consist of multiple fan and motor cubes with individual backdraft dampers, spaced in the airway tunnel cross section to provide a uniform air flow and velocity profile across the entire air way tunnel cross section and components contained therein. Provide gravity-driven backdraft dampers on the discharge of the fans.
10. Submitted sound and performance data for preapproval showing only single fan performance for multiple fan arrays will be returned without review.
11. All variable frequency drives shall be factory wired in a UL-508A electrical panel and shall be listed as such. Wire sizing shall be determined in accordance with NEC standards. The supply fan array shall have its own individual unit mounted and wired control panel. The control panel shall incorporate individual thermal overloads/disconnects for each motor. Each overload will have an auxiliary contact wired in series. The dry contact will be used as an alarm for the building automation system indicating that there has been a fan motor failure. In addition, the unit control panel shall be provided with individual door mounted pilot lights showing the status (ON/OFF) of each motor. If the motors are enabled and functioning properly, the lights shall be "ON."
12. Motor and Drive:
 - a. Refer to Specification 20 0513 - Motor Requirements for HVAC and Plumbing Equipment.
 - b. Variable frequency drives: Temperature Controls contractor shall provide one variable frequency drive for each fan motor. Drives shall be provided in a factory NEMA 1 enclosure. Refer to Section 20 2923.

D. Controls

1. Provide PLC controller with open protocol integration.
2. Hard-wire VFD analog control points to single terminal block for connection by controls contractor to control all fans.

E. Fan Motors

1. Motors shall be premium efficiency and meet the requirements of Division 20 Section 20 0513, "Motor Requirements for Mechanical, Plumbing, and Fire Suppression Equipment."
2. Enclosure Type: Totally enclosed, fan cooled (TEFC).

F. Gravity Backdraft Dampers

1. Gravity backdraft dampers shall be internally mounted. Dampers shall be premium ultra low leak, parallel blade on discharge of fans, with a maximum pressure drop of 0.1" w.g. Dampers shall be Ruskin CD-60 double-skin airfoil design or equal for minimum air leakage and pressure drop. Leakage rate shall not exceed 3 cfm/square foot at 1" w.g. (AMCA Class 1A). All leakage testing and pressure ratings shall be based on AMCA Standard 500-D. Manufacturer shall submit brand and model of damper(s) being furnished, if not Ruskin CD-60.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine location for fans and control panel to be installed with installer present for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine electrical services to verify actual locations of connections prior to installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install all shipped loose materials.
- C. All field penetrations through casing shall be neatly performed by drilling or saw cutting.
 - 1. All casing penetrations shall be sealed be airtight. Provide sealed sleeves or grommets with metal or plastic escutcheons for all field-penetrations through the casing including but not necessarily limited to power wiring and control wiring.
- D. Connections
 - 1. Electrical
 - a. Coordinate all electrical power wiring and connections.

3.3 FIELD QUALITY CONTROL

- A. Tests and Inspections
 - 1. Fan Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
 - 1. Provide written report prepared by the manufacturer's representative stating that the systems are installed and services provided under this section are in accordance with manufacturer's recommendations and are operating properly.
- C. Air handling unit or components will be considered defective if unit or components do not pass tests and inspections.

3.4 ADJUSTING, CLEANING AND DEMONSTRATION

- A. Adjusting
 - 1. Adjust damper linkages for proper damper operation.
 - 2. Comply with requirements of specifications for "Testing, Adjusting, and Balancing for HVAC" for air handling system testing, adjusting, and balancing.

B. Cleaning

1. After completing system installation and testing, adjusting, and balancing air handling unit and air-distribution systems and after completing startup service, clean air handling units internally to remove foreign material and construction dirt and dust. Clean fan wheels, cabinets, and dampers.

3.5 START UP

A. Final Checks Before Start-Up

1. Complete installation and startup checks according to manufacturer's written instructions.
2. Verify that shipping, blocking, and bracing are removed.
3. Verify that mating flanges at shipping splits are installed, sealed and bolted per manufacturers recommendations
4. Verify that unit is secure on mountings and supporting devices.
5. Verify that connections to electrical systems are complete.
6. Verify that proper thermal-overload protection is installed in motors, controllers, and switches.
7. Verify proper motor rotation direction, free fan wheel rotation, and smooth bearing operations.
8. Verify that bearings and other moving parts are lubricated with factory-recommended lubricants.
9. Verify that backdraft dampers are operational.

B. Starting procedures include the following:

1. Energize motor; verify proper operation of motor, drive system, and fan wheel. Adjust fan to indicated rpm.
2. Measure and record motor electrical values for voltage and amperage.

C. Provide factory trained technician to perform startup procedures per manufacturer's instructions.

3.6 DEMONSTRATION

A. Train Owner's Maintenance Personnel

1. Procedures and schedules related to start-up and shut-down, troubleshooting, servicing, preventative maintenance and how to obtain replacement parts.

B. The manufacturer shall provide a minimum of four (4) hours of training to Owner's personnel per unit.

1. Contractor shall coordinate and schedule training by manufacturer's representative to occur immediately following fan replacement, before Contractor has left site.

END OF SECTION



Grumman/Butkus Associates
Energy Efficiency Consultants and Sustainable Design Engineers

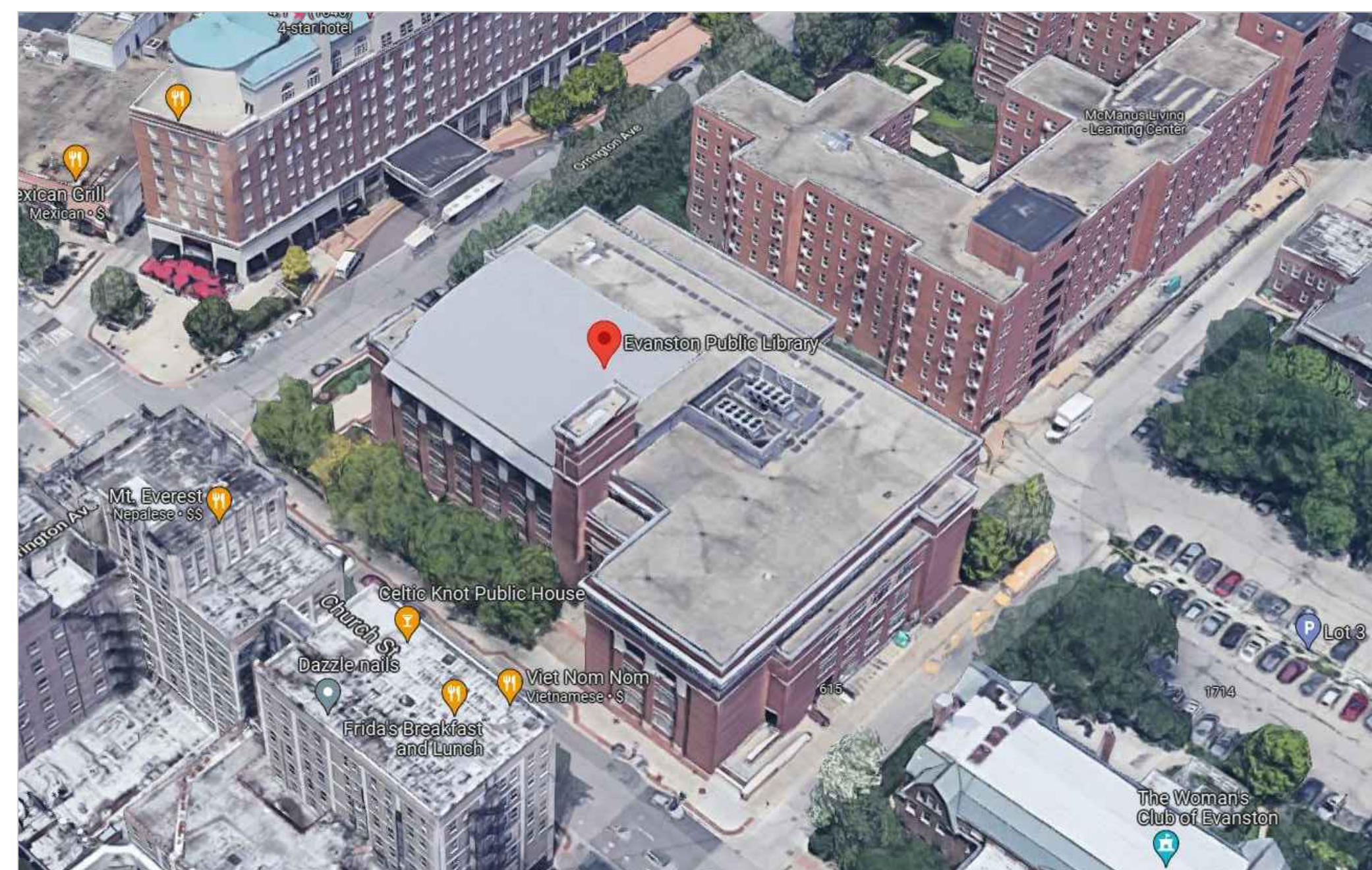
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CONSULTANTS

SEAL

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SITE PLAN



DRAWING INDEX

- CS COVER SHEET
- M001 MECHANICAL SYMBOLS AND ABBREVIATIONS
- M002 MECHANICAL SCHEDULES
- MD100 MECHANICAL PLAN - DEMOLITION
- M100 MECHANICAL PLAN - NEW WORK
- M200 TEMPERATURE CONTROLS
- E001 ELECTRICAL SYMBOLS AND SPECIFICATIONS
- E002 ELECTRICAL DETAILS, SCHEDULES AND DIAGRAMS
- ED100 ELECTRICAL PLAN - DEMOLITION
- E100 ELECTRICAL PLAN - NEW WORK

GENERAL PROJECT NOTES

1. EVANSTON LIBRARY POINT OF CONTACT:
JOHN DEVANEY, MANAGER.
JDEVANEY@CITYOFEVANSTON.ORG.
847.448.8622
2. FACILITY OPERATING HOURS:
SUNDAY 12 PM - 6 PM
MONDAY-THURSDAY 10 AM - 8 PM
FRIDAY-SATURDAY 9 AM - 6 PM
3. THE MECHANICAL CONTRACTOR SHALL BE THE PRIME CONTRACTOR FOR THE PROJECT. THE MECHANICAL CONTRACTOR SHALL INCLUDE ALL COSTS ASSOCIATED WITH THE WORK OF SUBCONTRACTORS AND THE COORDINATION AND ADMINISTRATION OF THAT WORK IN THE BID SUBMITTED.
4. TEMPERATURE CONTROLS WORK SHALL BE A SUBCONTRACT TO THE PRIME CONTRACTOR. SIEMENS BUILDING TECHNOLOGIES SHALL BE THE TEMPERATURE CONTROLS CONTRACTOR. CONTACT ERIC GREUBEL. ERIC.GREUBEL@SIEMENS.COM
5. RELOCATE ANY DUCT, SPRINKLER, FIRE ALARM DEVICE, LIGHT, CONDUIT, PIPE, SWITCH, VENT, WIRE, ETC. REQUIRED FOR DEMOLITION OR INSTALLATION OF NEW WORK.
6. PROVIDE TESTING, ADJUSTING AND BALANCING OF AIR FLOWS AS SPECIFIED.
7. PROVIDE EQUIPMENT AND SYSTEM STARTUP AND TESTING. FAN ARRAY VENDOR SHALL VISIT THE SITE AND PROVIDE DOCUMENTATION REPORT PER 01 7700.
8. PROVIDE WARRANTY, O&M MANUALS, RECORD AS-BUILT DRAWINGS AND ALL OTHER SPECIFIED CLOSEOUT DOCUMENTATION PER 01 7700.
9. REMOVE EVERYTHING FROM THE JOB SITE MADE OBSOLETE OR NOT NEEDED BY THIS WORK.
10. FOR BUILDING SYSTEM EMERGENCIES, CONTACT BUILDING MANAGER.
11. PRIME CONTRACTOR TO APPLY FOR PERMIT AND PROVIDE CONTRACTOR LICENSING, PERMIT FEES WILL BE PAID FOR BY THE CITY OF EVANSTON.

PHASING NOTES

1. THE INTENT OF THE PROJECT PHASING IS TO ALLOW FOR THE AIR HANDLING UNIT TO BE AVAILABLE FOR OPERATION SHOULD IT BE REQUIRED.
2. CONSTRUCTION WILL REQUIRE WORK DURING NORMAL BUSINESS HOURS, AND OUTSIDE OF NORMAL BUSINESS HOURS. CONTRACTOR TO INCLUDE FEE FOR UP TO 240 MAN-HOURS OF NIGHT AND WEEKEND WORK. ALL OTHER WORK SHALL OCCUR DURING NORMAL BUSINESS HOURS. COORDINATE SHUTDOWNS WITH FACILITIES MANAGER.
3. FANS CAN BE SHUT OFF AT ONE HOUR BEFORE CLOSING UNTIL ONE HOUR BEFORE OPENING THE FOLLOWING DAY.
4. ALL FANS SHALL BE OFF DURING DEMOLITION AND CONSTRUCTION ACTIVITIES INSIDE OF THE AIR HANDLING UNIT.
5. CONSTRUCTION SITE SHALL BE SWEEPED CLEAN AFTER EACH DAY OF CONSTRUCTION.
6. CONTRACTOR SHALL STAGE ANCILLARY EQUIPMENT AS REQUIRED TO MEET PHASING.
7. THE FOLLOWING OUTLINES THE GENERAL PROJECT PHASING. THE CONTRACTOR SHALL COORDINATE THE PHASE WITH ALL SUBCONTRACTORS.
 - A. NORTH FAN SHALL BE DEMOLISHED. EXISTING CONCRETE PAD SHALL REMAIN.
 - B. CONTRACTOR SHALL POUR 4" HOUSEKEEPING PAD UNDER NORTH SIDE OF FAN WALL.
 - C. INSTALL THE FIRST FOUR FANS OF THE FAN WALL ARRAY. STAGE THE INSTALLATION OF THE VFD CONTROL PANEL(S) SO THAT IT CAN BE ENERGIZED AFTER FIRST FOUR FANS ARE INSTALLED.
 - D. CONTRACTOR SHALL ERECT SHEET METAL PARTITION IN BETWEEN NORTH AND SOUTH HALF OF FAN ARRAY.
 - E. PARTIAL FAN ARRAY SHALL BE ENABLED IN HAND PRIOR TO THE DEMOLITION OF SOUTH FAN.
 - F. SOUTH FAN SHALL BE DEMOLISHED. EXISTING CONCRETE PAD SHALL REMAIN.
 - G. CONTRACTOR SHALL POUR 4" HOUSEKEEPING PAD UNDER SOUTH SIDE OF FAN WALL.
 - H. INSTALL THE LAST FOUR FANS OF THE FAN WALL ARRAY. CONTRACTOR TO INSTALL SECOND FAN ARRAY CONTROL PANEL (IF ALTERNATE ACCEPTED). FAN SHALL OPERATE IN HAND PRIOR TO NEXT DAY OCCUPANCY.
 - I. PROVIDE TEMPERATURE CONTROL AND TEST AND BALANCE AFTER FAN WALL CONSTRUCTION IS COMPLETE.
8. ALL OTHER WORK REQUIRED BY THE CONSTRUCTION DOCUMENTS NOT SPECIFICALLY INDICATED AS BEING PROVIDED IN THE PROJECT PHASING SEQUENCE SHALL BE COORDINATED, SCHEDULED AND PROVIDED BY THE CONTRACTOR.

COVER SHEET
EVANSTON PUBLIC LIBRARY VENTILATION FAN
UPGRADES BID 22-07
1703 ORRINGTON, EVANSTON IL

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NO.	DESCRIPTION	DATE

REVISION		

SCALE		
NO SCALE		
DRAWN	CHECKED	APPROVED
GXI	MSB	JET
PROJECT NO.		
P21-0304-00		

CS

GENERAL	
DESIGNATION	DESCRIPTION
	DETAIL OR ENLARGED PLAN (SAME DRAWING)
	DETAIL OR ENLARGED PLAN (DIFFERENT DRAWING)
	SECTION OR ELEVATION (SAME DRAWING)
	SECTION OR ELEVATION (DIFFERENT DRAWING)
	(HEAVY LINES) - NEW PIPING/DUCTWORK/EQUIPMENT
	(THIN LINES) - EXISTING PIPING/DUCTWORK/EQUIPMENT TO REMAIN
	(HEAVY DASHED LINES) - EXISTING PIPING/DUCTWORK/EQUIPMENT TO BE DEMOLISHED
	POINT OF CONNECTION BETWEEN NEW/DEMOLISH WORK AND EXISTING MATCH LINE

RISER TAGS	
DESIGNATION	DESCRIPTION
	CONDENSATE DRAIN
CD	CONDENSATE DRAIN
CHW	CHILLED WATER
CR	CONDENSATE (STEAM)
CW	CONDENSER WATER
FO	FUEL OIL
GLY	GLYCOL
HW	HOT WATER
MGV	MEDICAL GAS/VACUUM
PCHW	PRIMARY CHILLED WATER
R	REFRIGERANT
SCHW	SECONDARY CHILLED WATER
STM	STEAM

DUCTWORK SYMBOLS	
DESIGNATION	DESCRIPTION
	ACCESS DOOR OR PANEL, VERTICAL OR HORIZONTAL
	ACOUSTICAL LINING, DIMENSIONS SHOWN ARE CLEAR AIR PATH
	DUCT OFFSET (DOWN) IN DIRECTION OF FLOW
	DUCT OFFSET (UP) IN DIRECTION OF FLOW
	RECTANGULAR SUPPLY DUCT ELBOW TURNED DOWN
	RECTANGULAR SUPPLY DUCT ELBOW TURNED UP
	RECTANGULAR EXHAUST/RETURN DUCT ELBOW TURNED DOWN
	RECTANGULAR EXHAUST/RETURN DUCT ELBOW TURNED UP
	ROUND DUCT ELBOW TURNED DOWN
	ROUND DUCT ELBOW TURNED UP
	DIRECTION OF FLOW
	DUCT AIR PATH SIZE, FIRST FIGURE IS SIDE SHOWN
	FLEXIBLE CONNECTION
	FLEXIBLE DUCT
	DUCT SECTION, POSITIVE PRESSURE, FIRST FIGURE IS TOP
	DUCT SECTION, NEGATIVE PRESSURE, FIRST FIGURE IS TOP
	TRANSITION WITH DUCT SIZE
	RECTANGULAR ELBOWS WITH TURNING VANES
	RECTANGULAR ELBOWS WITHOUT TURNING VANES
	DUCT PENETRATION THROUGH BEAM
	CAPPED DUCT - RECTANGULAR OR ROUND
	MOTOR OPERATED DAMPER
	CEILING-MOUNTED SUPPLY AIR TERMINAL DEVICE (4-WAY THROW)
	CEILING-MOUNTED SUPPLY AIR TERMINAL DEVICE (3-WAY THROW, SHADED AREA INDICATES BLANKED OFF SIDE)
	CEILING-MOUNTED SUPPLY AIR TERMINAL DEVICE (2-WAY THROW, SHADED AREAS INDICATE BLANKED OFF SIDES)
	CEILING-MOUNTED EXHAUST/RETURN AIR TERMINAL DEVICE
	WALL OR DUCT MOUNTED EXHAUST/RETURN AIR TERMINAL DEVICE
	WALL OR DUCT MOUNTED SUPPLY AIR TERMINAL DEVICE
	TRANSFER AIR DOOR GRILLE
	UNDERCUT DOOR
	WALL MOUNTED TRANSFER AIR ASSEMBLY INCLUDING SHEETMETAL SLEEVE AND TWO (2) REGISTERS
	LINEAR SUPPLY AIR DIFFUSER
	LINEAR RETURN AIR DIFFUSER
	CENTRIFUGAL FAN
	PROPELLER FAN
	AXIAL FAN
	VOLUME DAMPER
	SMOKE DAMPER
	FIRE DAMPER
	COMBINATION SMOKE/FIRE DAMPER
	HUMIDIFIER

EQUIPMENT TAGS	
DESIGNATION	DESCRIPTION
AB	AIR BLENDER
AC	AIR COMPRESSOR
ACC	AIR-COOLED CONDENSER
ACCU	AIR-COOLED CONDENSING UNIT
ACU	AIR CONDITIONING UNIT (AIR-COOLED OR WATER-COOLED)
AHU	AIR HANDLING UNIT
AP	MEDICAL GAS/VACUUM AREA ALARM PANEL
B	BOILER
BB	BASEBOARD RADIATION (STEAM, HOT WATER OR ELECTRIC)
CC	CHILLED WATER COOLING COIL
COHR	CLOSED CIRCUIT HEAT REJECTOR
CH	CHILLER
CT	COOLING TOWER
CV	CONTROL VALVE
DX	DIRECT EXPANSION COOLING COIL
E	EXHAUST FAN
EC	EVAPORATIVE CONDENSER
ER	EXHAUST/RETURN FAN
FCU	FAN COIL UNIT
FIL	FILTER
HC	HEATING COIL
HP	HEAT PUMP (AIR-SOURCED OR WATER-SOURCED)
HUM	HUMIDIFIER
HX	HEAT EXCHANGER
IO	MEDICAL GAS/VACUUM INLET/OUTLET
IU	INDUCTION UNIT
KE	KITCHEN EXHAUST FAN
MU	GAS-FIRED MAKEUP AIR UNIT
P	PUMP
PH	INTAKE & EXHAUST PENTHOUSE
PRV	PRESSURE REDUCING VALVE
RCP	RADIANT CEILING HEATING/COOLING PANEL
RTU	PACKAGED ROOFTOP UNIT
S	SUPPLY FAN
SA	SOUND ATTENUATOR
SC	SHELL AND TUBE STEAM CONVERTOR
T	TANK
TD	TERMINAL DEVICE
TE	TOILET EXHAUST FAN
TU	TERMINAL UNIT
UH	UNIT HEATER
VFD	UNIT HEATER
VP	VACUUM PUMP
ZVB	MEDICAL GAS/VACUUM ZONE VALVE BOX

PIPEWORK FITTINGS	
DESIGNATION	DESCRIPTION
	CAP
	CONNECTION, BOTTOM
	CONNECTION, TOP
	ELBOW, 90°
	ELBOW TURNED UP
	ELBOW TURNED DOWN
	ELBOW, REDUCING (SHOW SIZES)
	ELBOW, LONG RADIUS
	ELBOW, SIDE OUTLET, OUTLET UP
	ELBOW, SIDE OUTLET, OUTLET DOWN
	LATERAL BRANCH
	REDUCER, CONCENTRIC
	INCREASER, CONCENTRIC
	REDUCER, ECCENTRIC STRAIGHT INVERT
	REDUCER, ECCENTRIC STRAIGHT CROWN
	TEE
	TEE, OUTLET UP
	TEE, OUTLET DOWN
	TEE, REDUCING (SHOW SIZES)
	TEE, SIDE OUTLET, OUTLET UP
	TEE, SIDE OUTLET, OUTLET DOWN
	UNION, SCREWED
	PITCH OF PIPE - RISE (R), DROP (D)

ABBREVIATIONS	
DESIGNATION	DESCRIPTION
ABV	ABOVE
ACT	ACOUSTIC CEILING TILE
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
BAS	BUILDING AUTOMATION SYSTEM
BDD	BACKDRAFT DAMPER
BHP	BRAKE HORSEPOWER
BTU	BRITISH THERMAL UNIT
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
CONC	CONCRETE
CFSD	COMBINATION FIRE/SMOKE DAMPER
DB	DRY BULB
DDC	DIRECT DIGITAL CONTROL
DIA	DIAMETER
DWG	DRAWING
EL	ELEVATION
ELEC	ELECTRICAL
EQ	EQUIPMENT
EXH	EXHAUST
F OR °F	FAHRENHEIT
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FLR	FLOOR
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FSM	FEET PER MINUTE
FT	FEET OR FOOT
GA	GAUGE
GAL	GALLONS
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
HTG	HEATING
HVAC	HEATING VENTILATING AND AIR CONDITIONING
ID	INSIDE DIAMETER
KW	KILOWATT
LCP	LOCAL CONTROL PANEL
LRA	LOCK ROTOR AMPS
MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MHP	MOTOR HORSEPOWER
MIN	MINIMUM
MOD	MOTOR OPERATED DAMPER
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTDOOR AIR
OD	OUTSIDE DIAMETER
PSIG	POUNDS PER SQUARE INCH (GAUGE)
RH	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
SD	SMOKE DAMPER
SQ	SQUARE
TP	TOTAL PRESSURE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
WB	WET BULB
W	WITH
W/O	WITHOUT
WG	WATER GAUGE



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MECHANICAL SYMBOLS AND ABBREVIATIONS
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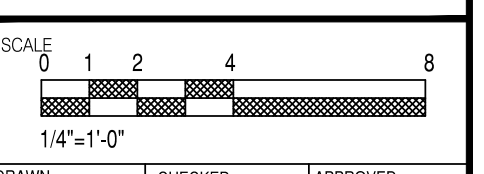
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MECHANICAL PLAN - DEMOLITION

EVANSTON PUBLIC LIBRARY VENTILATION FAN
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ISSUES & REVISIONS		
NO.	DESCRIPTION	DATE
1	ISSUED FOR BIC	1/8/22

MECHANICAL PLAN - DEMOLITION

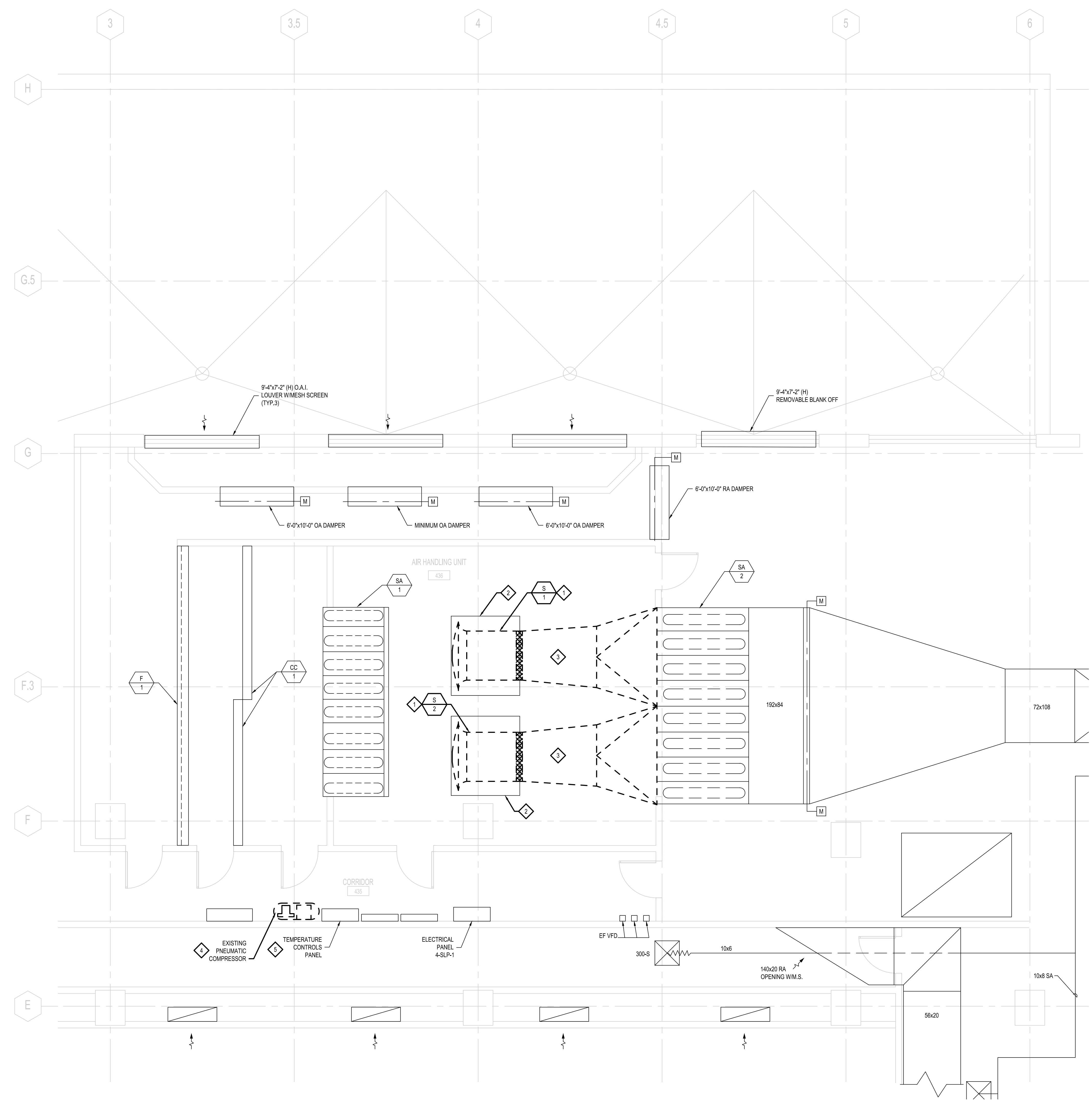


PROJECT NO. P21-0304-00

MD100

- GENERAL NOTES**
- ANY WORK ASSOCIATED WITH REMOVAL OF ANY HAZARDOUS MATERIAL IS BEYOND SCOPE OF THIS CONTRACT. CONTRACTOR SHALL SUSPEND WORK AND NOTIFY OWNER IF PRESENCE OF HAZARDOUS MATERIALS IN WORK AREA IS SUSPECTED.
 - ANY INTERRUPTION OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE FACILITY MANAGER SO AS NOT TO INTERFERE WITH THE PRESENT BUILDING OPERATION. SHUTDOWN TIMES AND DURATIONS WILL BE BASED ON BUILDING OCCUPANCY AND EXPECTED WEATHER.
 - THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
 - CONTRACTOR SHALL COORDINATE THE INSTALLATION OF PIPING, DUCTWORK AND EQUIPMENT WITH THE WORK OF ALL OTHER TRADES.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR RELOCATION OF ANY EXISTING INTERFERENCES AS REQUIRED, INCLUDING EXISTING EQUIPMENT, MATERIALS, PIPING, CONDUIT, HANGERS, DEVICES, ETC., AT NO ADDITIONAL COST.
 - THE CONTRACTOR SHALL INCLUDE ALL OTHER ITEMS OR WORK REQUIRED TO COMPLETE THE WORK INCLUDING EQUIPMENT MOVING AND RIGGING, CAULKING, SEALING, INSERTS, SUPPORTS, HANGERS, SLEEVES, AND WALL PLATES.
 - THE CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL REQUIRED FOR THE PROPER INSTALLATION OF ALL MECHANICAL SYSTEMS.
 - SHOP DRAWINGS AT 1/4"=1'-0" SCALE INDICATING DUCT AND EQUIPMENT LOCATIONS SHALL BE SUBMITTED BY INSTALLING CONTRACTORS FOR ENGINEER'S REVIEW PRIOR TO INSTALLATION. FAILURE TO DO SO MAY RESULT IN THE INSTALLING CONTRACTOR BEING REQUIRED TO RELOCATE SUCH ITEMS AT THE DIRECTION OF THE ENGINEER OR OWNER AT THE CONTRACTOR'S EXPENSE.

- DEMOLITION PLAN NOTES**
- DEMOLISH EXISTING SUPPLY FAN INCLUDING VIBRATION ISOLATORS, ELECTRICAL BACK TO SOURCE, CONTROLS BACK TO SOURCE, AND PNEUMATIC CONTROLS BACK TO AIR COMPRESSOR. SEE DRAWING CS FOR PHASING PLAN AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
 - EXISTING CONCRETE PAD SHALL REMAIN.
 - DEMOLISH EXISTING SUPPLY DUCTWORK FROM SUPPLY FAN TO SOUND ATTENUATOR. PREPARE SOUND ATTENUATOR CONNECTION FOR NEW DUCTWORK. SEE DRAWING CS FOR PHASING PLAN.
 - DEMOLISH EXISTING PNEUMATIC COMPRESSOR INCLUDING ELECTRICAL BACK TO SOURCE AND PNEUMATIC TUBING. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
 - DEMOLISH EXISTING TEMPERATURE CONTROLS MADE OBSOLETE BY THIS PROJECT INCLUDING PNEUMATIC TUBING, FAN ELECTRO-PNEUMATIC PRESSURE TRANSDUCERS, AND AIRFLOW MEASURING STATIONS. EXISTING STATIC PRESSURE SENSOR TO REMAIN. SEE TEMPERATURE CONTROLS DRAWINGS FOR ADDITIONAL INFORMATION.
 - CONTRACTOR SHALL RELOCATE EXISTING SPRINKLER PIPING AS NEEDED TO ACCOMMODATE NEW FAN WALL AND FAN WALL HOIST.



1 MECHANICAL PLAN - DEMOLITION

DATE PLOTTED: 1/11/2022 10:04:00 AM PLOTTER: HP DesignJet T1100e



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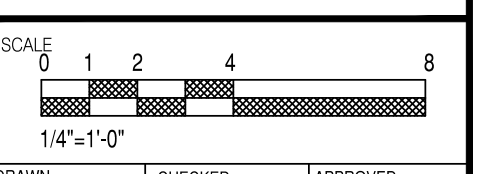
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MECHANICAL PLAN - NEW WORK

EVANSTON PUBLIC LIBRARY VENTILATION FAN UPGRADES BID 22-07
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NO.	DESCRIPTION	DATE

MECHANICAL PLAN



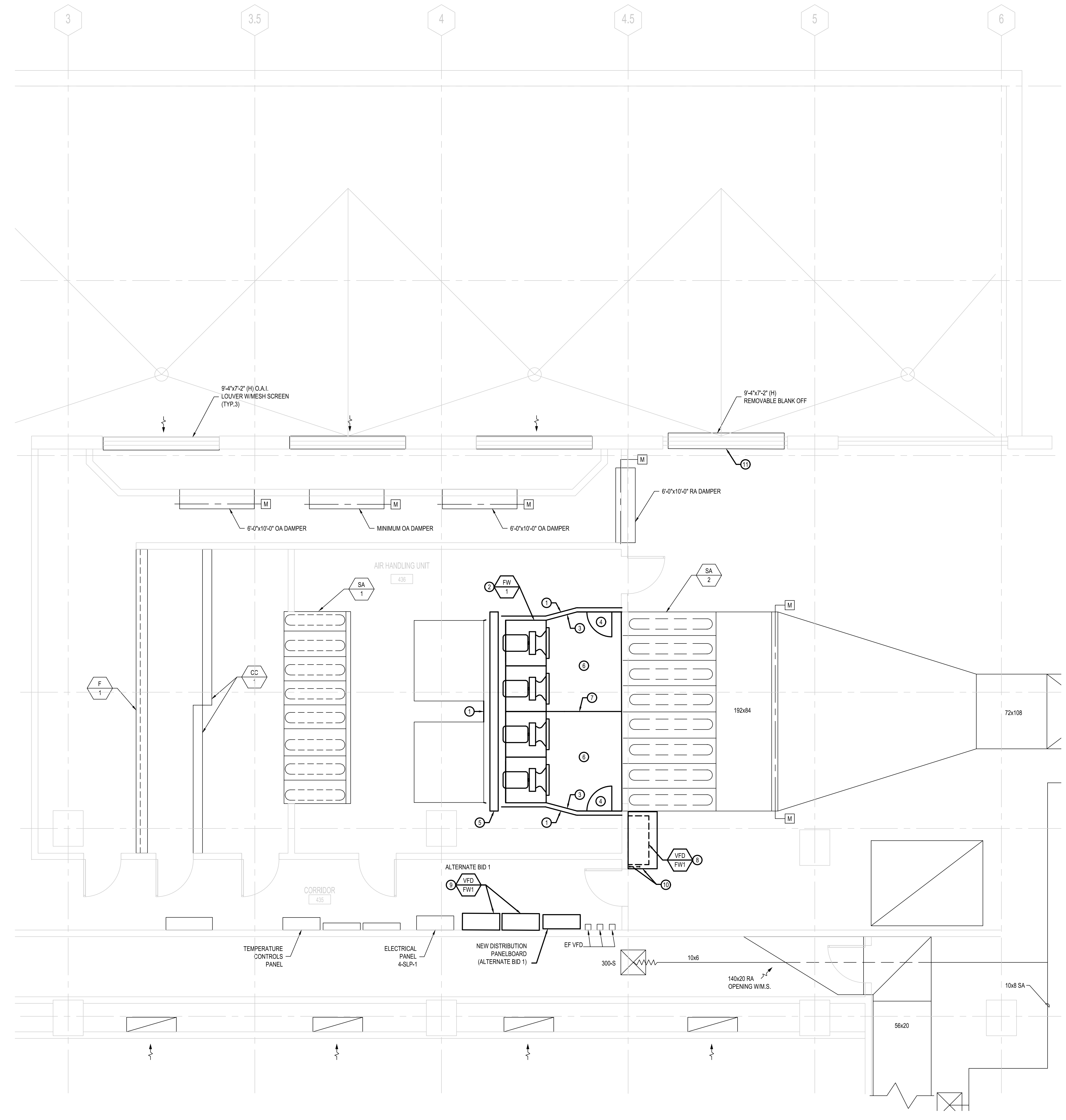
DRAWN: GJM
CHECKED: MSB
APPROVED: JET

PROJECT NO.: P21-0304-00

M100

- GENERAL NOTES**
- ANY WORK ASSOCIATED WITH REMOVAL OF ANY HAZARDOUS MATERIAL IS BEYOND SCOPE OF THIS CONTRACT. CONTRACTOR SHALL SUSPEND WORK AND NOTIFY OWNER IF PRESENCE OF HAZARDOUS MATERIALS IN WORK AREA IS SUSPECTED.
 - ANY INTERRUPTION OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE FACILITY MANAGER SO AS NOT TO INTERFERE WITH THE PRESENT BUILDING OPERATION. SHUTDOWN TIMES AND DURATIONS WILL BE BASED ON BUILDING OCCUPANCY AND EXPECTED WEATHER.
 - THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
 - CONTRACTOR SHALL COORDINATE THE INSTALLATION OF PIPING, DUCTWORK AND EQUIPMENT WITH THE WORK OF ALL OTHER TRADES.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR RELOCATION OF ANY EXISTING INTERFERENCES AS REQUIRED, INCLUDING EXISTING EQUIPMENT, MATERIALS, PIPING, CONDUIT, HANGERS, DEVICES, ETC., AT NO ADDITIONAL COST.
 - THE CONTRACTOR SHALL INCLUDE ALL OTHER ITEMS OR WORK REQUIRED TO COMPLETE THE WORK INCLUDING EQUIPMENT MOVING AND RIGGING, CAULKING, SEALING, INSERTS, SUPPORTS, HANGERS, SLEEVES, AND WALL PLATES.
 - THE CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL REQUIRED FOR THE PROPER INSTALLATION OF ALL MECHANICAL SYSTEMS.
 - SHOP DRAWINGS AT 1/4"=1'-0" SCALE INDICATING DUCT AND EQUIPMENT LOCATIONS SHALL BE SUBMITTED BY INSTALLING CONTRACTORS FOR ENGINEER'S REVIEW PRIOR TO INSTALLATION. FAILURE TO DO SO MAY RESULT IN THE INSTALLING CONTRACTOR BEING REQUIRED TO RELOCATE SUCH ITEMS AT THE DIRECTION OF THE ENGINEER OR OWNER AT THE CONTRACTOR'S EXPENSE.

- CONSTRUCTION PLAN NOTES**
- PROVIDE 4" HIGH CONCRETE PAD UNDER FAN WALL AND SUPPLY PLENUM. CONCRETE PAD SHALL EXTEND FROM EXISTING SUPPLY FAN PADS TO INLET OF SOUND ATTENUATOR. TIE NEW PAD TO EXISTING PADS WITH REBAR. SEE PHASING PLAN ON DRAWING CS.
 - PROVIDE FAN WALL WITH 2X4 FAN ARRANGEMENT INCLUDING ELECTRICAL, PNEUMATIC TUBING FOR AIRFLOW MEASUREMENT AND CONTROLS. FAN WALL SHALL BE FIELD ERECTED. SECURE FAN WALL TO STRUCTURE BELOW SUFFICIENT TO COUNTER FAN THRUST THROUGH ALL OPERATING CONDITIONS. CAULK SEAL FAN HOUSING SEAMS IN BETWEEN FANS ON INLET AND OUTLET SIDE AND AROUND PERIMETER OF FAN ARRAY. SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS, PHASING PLAN ON DRAWING CS, TEMPERATURE CONTROLS AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
 - PROVIDE MINIMUM 16 GA. REINFORCED G90 GALVANIZED SUPPLY PLENUM TO BE FIELD ASSEMBLED TO ENCLOSE FAN WALL AND FORM SUPPLY DUCT FROM FAN WALL TO SOUND ATTENUATOR. ENCLOSURE SHALL BE SECURED TO STRUCTURE BELOW AND COMPLETELY SEALED AND PRESSURE TESTED. SEE PHASING PLAN ON DRAWING CS.
 - PROVIDE 24"X60" ACCESS DOOR WITH INSPECTION WINDOW EQUAL TO RUSKIN GPAD. DOOR SHALL OPEN AGAINST 6" W.G. PRESSURE.
 - PROVIDE I-BEAM HOIST RAIL FOR FAN/MOTOR SERVICE SIZED TO SUPPORT SINGLE FAN/MOTOR ASSEMBLY OF APPROXIMATELY 500 LBS. SECURE TO STRUCTURE ABOVE. CONTRACTOR TO PROVIDE 1-TON I-BEAM TROLLEY AND CHAIN HOIST.
 - PROVIDE MINIMUM 3/16" STEEL DIAMOND TREAD FLOOR INSIDE OF SUPPLY DUCT. SECURE TO STRUCTURE BELOW.
 - PROVIDE PARTITION TO MATCH SUPPLY PLENUM CONSTRUCTION TO ALLOW FOR PHASING. SEE PHASING PLAN ON DRAWING CS.
 - BASE BID LOCATION FOR SINGLE VFD CONTROL PANEL. SEE PHASING PLAN ON DRAWING CS AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
 - ALTERNATE BID 1 LOCATION FOR TWO VFD CONTROL PANEL CONFIGURATION WITH EACH PANEL CONTROLLING FOUR FANS EACH. SEE PHASING PLAN ON DRAWING CS AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
 - PROVIDE 16 GA. GALVANIZED DRAIN PAN ABOVE NEW VFD CONTROL PANEL. PROVIDE 3/4" DRAIN CONNECTION AND EXTEND PIPING TO FLOOR.
 - CONTRACTOR MAY REMOVE BLANK OFF LOUVER FOR RIGGING OF MATERIALS.



1 MECHANICAL PLAN - NEW WORK

DATE PLOTTED: 11/14/2023 10:58:11 AM PLOTTER: HP DesignJet T1100e



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Energy Efficiency Consulting and Sustainable Design Engineers

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SCALE

TEMPERATURE CONTROLS
 EVANSTON PUBLIC LIBRARY VENTILATION FAN
 UPGRADES BID 22-07
 1703 ORRINGTON, EVANSTON IL

ISSUES & REVISIONS		
NO.	DESCRIPTION	DATE

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PROJECT NO. P21-0304-00

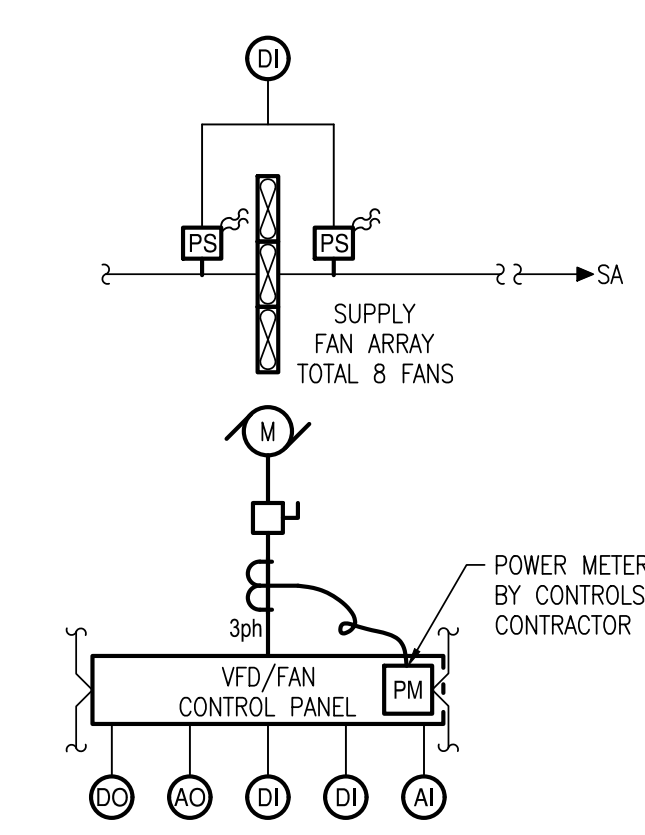
M200

TEMPERATURE CONTROL NOTES

- GENERAL CONTROLS NOTES:
- CONTROLS SHALL BE PROVIDED BY THE EXISTING BUILDING AUTOMATION SYSTEM VENDOR. CONTROLS CONTRACTOR SHALL PROVIDE AS REQUIRED SENSORS, TRANSMITTERS, DIGITAL CONTROL COMPONENTS, AND WIRING/CONDUIT. DIGITAL CONTROL COMPONENTS INSTALLED WITHIN THE LAST FIVE YEARS MAY BE REUSED.
 - ALL POINTS SHALL BE ADDRESSABLE AT THE EXISTING FRONT END COMPUTER LOCATED IN THE ENGINEER'S OFFICE. PROVIDE CONTROL GRAPHICS FOR RENOVATED FAN LAYOUT INSIDE EXISTING AIR HANDLING SYSTEM.
 - WHEN THE SUPPLY FANS ARE DE-ENERGIZED, ALL VALVES AND DAMPERS SHALL ASSUME THEIR NORMAL POSITION.
 - COMPLETELY DEMOLISH ALL EXISTING CONTROL DEVICES, EQUIPMENT AND MATERIALS THAT ARE NOT BEING REUSED FOR EXISTING AIR HANDLING UNIT.
 - EXISTING DEVICES INDICATED SHALL BE REMOVED/REINSTALLED AS REQUIRED FOR DEMOLITION AND INSTALLATION OF NEW WORK.
 - ALL TEMPERATURE CONTROL WIRING SHALL BE IN CONDUIT.
 - EXISTING PROGRAMMED START/STOP FROM EXISTING CENTRAL DDC BUILDING AUTOMATION SYSTEM SHALL CONTINUE TO BE UTILIZED.
 - WHEN THE SYSTEM IS OFF, SUPPLY FAN ARRAY WILL BE COMMANDED OFF AND ALL VALVES AND DAMPERS WILL RETURN TO THEIR NORMAL POSITIONS.
 - PNEUMATIC TUBING FOR AIRFLOW MEASURING SHALL BE RUN IN EMT CONDUIT.
 - TEMPERATURE CONTROL WORK BY SIEMENS SHOULD BE INCLUDED AS A SUBCONTRACT TO THE PRIME (MECHANICAL) CONTRACT.

TEMPERATURE CONTROLS: S-1 FAN ARRAY

- CONTROL PANEL WITH INTEGRATED VFDs TO BE PROVIDED BY FAN ARRAY VENDOR. PANEL SHALL HAVE ONE VFD PER FAN. MAINTAIN CLEARANCE AS REQUIRED FOR NED AND SERVICE/ACCESS. CONTROL PANEL SHALL INCLUDE AT A MINIMUM:
 - ONE VFD PER FAN MOTOR.
 - CONTROL PANEL ENCLOSURE TO BE MOUNTED AS SHOWN ON DRAWINGS. PLC OR SIMILAR TECHNOLOGY WILL COLLECT INFORMATION FROM EACH VFD AND DISPLAY AT A SINGLE LOCATION ON A HUMAN INTERFACE PANEL VISIBLE FROM THE FRONT OF THE PANEL. INTERFACE SHALL INDICATE FAN/MOTOR STATUS OF EACH FAN IN THE ARRAY; IT SHALL BE POSSIBLE FOR ANY COMBINATION OF FANS/MOTORS TO BE ENABLED/DISABLED FROM THE INTERFACE. ALL INFORMATION AVAILABLE AND ADJUSTABLE FROM THE CONTROL PANEL INTERFACE SHALL ALSO BE AVAILABLE AND ADJUSTABLE FROM THE FRONT END OF THE BUILDING AUTOMATION SYSTEM.
- CONNECT CONTROL DEVICES AFTER FAN ARRAY IS INSTALLED, INCLUDING EXISTING AND NEW DEVICES. NEW DEVICES INCLUDE VFD SPEED (INPUT AND OUTPUT), VFD FAULT, VFD START/STOP, AND PNEUMATIC TUBING FOR AIRFLOW MEASUREMENT TO EACH FAN.
- BASIS OF DESIGN CONTROL PANEL INCLUDES PRESSURE TRANSDUCERS FOR EACH FAN FACTORY-WIRED TO CONTROL PANEL FOR AIRFLOW MEASUREMENT. TOTAL FAN AIRFLOW SHALL BE VIA GATEWAY INTERFACE.
- COMMISSIONING OF ALL POINTS ASSOCIATED WITH THE FAN ARRAY INCLUDING STATUS POINTS, VFD POINTS, PIEZOMETER AIRFLOW MEASURING RINGS, STATIC PRESSURE SENSORS, ETC.



POINTS LIST

DESCRIPTION	POINT TYPE						REMARKS
	DI	DO	AI	AO	BACNET/	TREND	
	DIGITAL INPUT	DIGITAL OUTPUT	ANALOG INPUT	ANALOG OUTPUT	MODBUS		
SUPPLY FAN HIGH AND LOW PRESSURE SWITCH STATUS	X						EXISTING HARD-WIRED
VFD CONTROL PANEL STATUS	X						HARD-WIRED
INDIVIDUAL SUPPLY FAN FAILURE ALARM STATUS	X						HARD-WIRED
VFD CONTROL PANEL ALARM	X						HARD-WIRED
SUPPLY FAN ARRAY VFD SPEED CONTROL				X		X	SEE NOTE 1.
SUPPLY FAN ARRAY START/STOP		X					HARD-WIRED
SUPPLY AIRFLOW RATE					X	X	SEE NOTE 2.
INDIVIDUAL FAN/VFD STATUS					X		VIA VFD CONTROL PANEL INTEGRATION
INDIVIDUAL FAN/VFD FAULTS					X		VIA VFD CONTROL PANEL INTEGRATION
TOTAL FAN KW					X	X	VIA MODBUS INTEGRATION. SEE NOTE 3
TOTAL FAN KWH					X	X	VIA MODBUS INTEGRATION. SEE NOTE 3

- NOTES:
- CONTROL PANEL BASIS OF DESIGN INCLUDES WIRING OF ALL VFD SPEED CONTROL POINTS TO SINGLE TERMINAL BLOCK.
 - MAP AT THE FRONT END ALL AIR VELOCITY MEASUREMENTS AS SENSED BY MANUFACTURER PROVIDED AFMS BELL HOUSING AIRFLOW MEASURING STATION SENSORS VIA BACNET INTERFACE.
 - PROVIDE DIN-STYLE POWER METER EQUAL TO SCHNEIDER PM3250. MOUNT INSIDE VFD CONTROL PANEL(S).
 - TEMPERATURE CONTROLS CONTRACTOR TO REWIRE EXISTING SAFETIES ONTO NEW FAN WALL VFD PANEL(S). SAFETIES INCLUDE:
 - SMOKE/FIRE DEVICES
 - HIGH AND LOW STATIC PRESSURE SAFETIES
 - LOW TEMPERATURE CUTOFF
 - ISOLATION DAMPER END SWITCHES
 - TEMPERATURE CONTROL CONTRACTOR SHALL INCLUDE FEE TO WIRE AND RUN ONE PANEL (BASE BID) OR TWO PANELS (ALTERNATE BID). ADDITIONAL POINTS/DEVICES SHALL BE PROVIDED AS NEEDED (EG. POWER METER, PANEL INTEGRATION, ETC.)

ELECTRICAL SYMBOL LEGEND

Table with columns for symbols and descriptions. Includes sections for POWER, LOW VOLTAGE, LIGHTING, FIRE ALARM, MISCELLANEOUS, and ANNOTATION.

ELECTRICAL ABBREVIATIONS

Table with columns for abbreviations and descriptions. Includes sections for Document 1, Document 2, and Document 3.

Table with columns for abbreviations and descriptions. Includes sections for Document 4, Document 5, and Document 6.

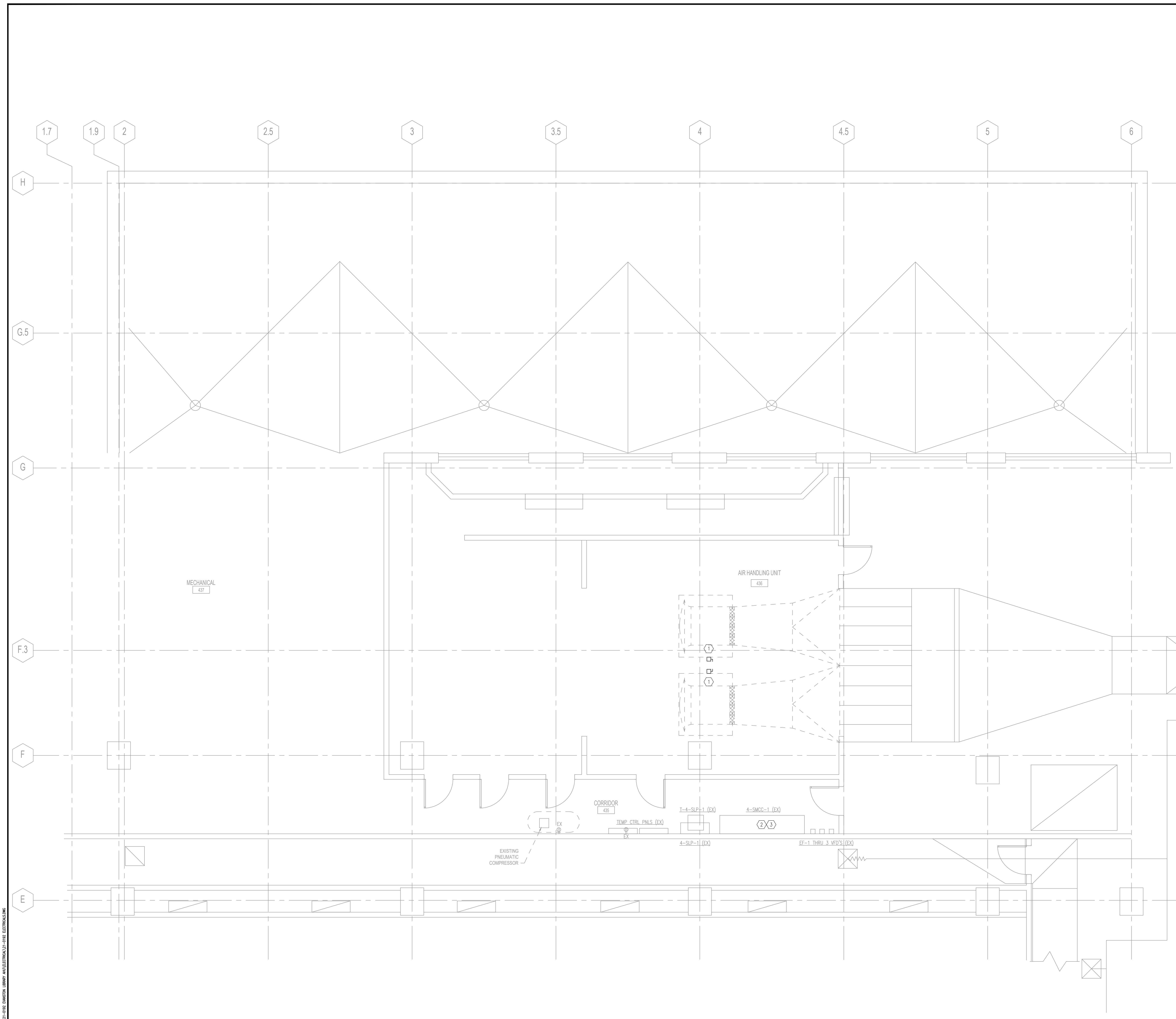
Table with columns for abbreviations and descriptions. Includes sections for Document 7, Document 8, and Document 9.

Table with columns for abbreviations and descriptions. Includes sections for Document 10, Document 11, and Document 12.

Table with columns for abbreviations and descriptions. Includes sections for Document 13, Document 14, and Document 15.

Grumman/Butkus Associates logo and contact information. Includes address, phone, and website details.

E001 project identification code.



KEYED ELECTRICAL NOTES

1. DISCONNECT AND MAKE SAFE FOR REMOVAL BY OTHERS. REMOVE DISCONNECT SWITCH AND FEEDER BACK TO EXISTING 4-SMCC-1. SEAL OPENINGS THRU PLENUM ENCLOSURE LEFT BY DEMOLITION. TYP.
2. BASE BID: DISCONNECT EXISTING SUPPLY FANS (5-1 & 5-2) FROM EXISTING MCC.
3. ALTERNATE BID: REMOVE MCC IN ITS ENTIRETY. REPLACE WITH NEW DISTRIBUTION PANEL DPMECH-4 AND DUAL VFD PLC PANELS.
4. BASE BID: LOCATION OF NEW SINGLE VFD PLC. CONNECT TO EXISTING MCC.
5. 3P-60A, LOCAL, PLENUM APPROVED, INDIVIDUAL MOTOR DISCONNECTS. PROVIDE UNISTRUT MOUNTING TO EXISTING COLUMN AS REQUIRED.
6. ALTERNATE BID: NEW LOCATION OF DPMECH-4 & DUAL VFD PLC'S IN PREVIOUS MCC LOCATION.
7. ALL WIRING METHODS WITHIN THE AIR HANDLING UNIT PLENUM SHALL BE APPROVED FOR INSTALLATION WITHIN AN AIR HANDLING UNIT PLENUM PER ARTICLE 300.22 OF THE NEC.
8. ALL WIRING BETWEEN VFD CONTROL PANEL AND MOTORS SHALL BE MADE WITH VFD CABLE. ROUTE FEEDER AS DIRECT AS POSSIBLE.
9. GC TO PROVIDE DRAIN PAN ABOVE VFD CONTROL PANEL.

Grumman/Butkus Associates
 Energy Efficiency Consultants and Sustainable Design Engineers
 620 Davis St. Ste 300
 Evanston, Illinois 60201 4446
 847.328.3555 grummanbutkus.com



ELECTRICAL PLAN - DEMOLITION
EVANSTON LIBRARY VENTILATION FAN
UPGRADES BID 22-07
1703 ORRINGTON, EVANSTON, IL

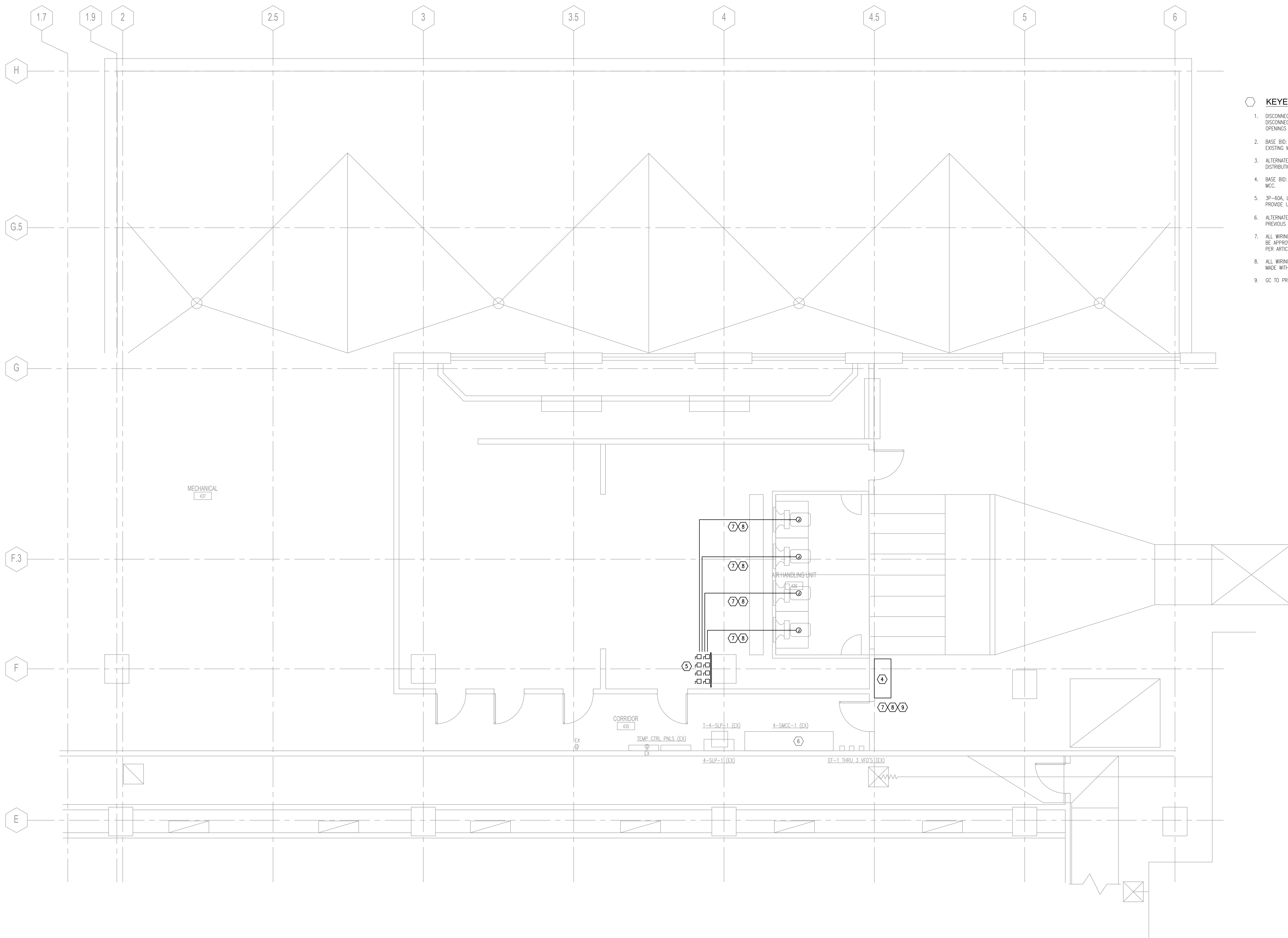
ISSUES & REVISIONS		
NO.	DESCRIPTION	DATE
	ISSUED FOR BID	1/28/22

REVISED
 SCALE

DRAWN ELB	CHECKED ELB	APPROVED ELB
PROJECT NO. P21-0304-00		

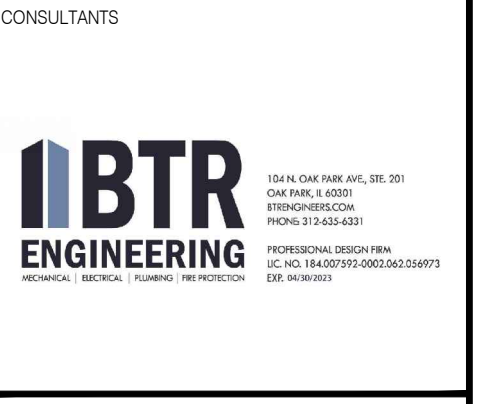
1 ELECTRICAL DEMOLITION PLAN
 SCALE: 1/4"=1'-0"

ED100



- KEYED ELECTRICAL NOTES**
- DISCONNECT AND MAKE SAFE FOR REMOVAL BY OTHERS. REMOVE DISCONNECT SWITCH AND FEEDER BACK TO EXISTING 4-SMCC-1. SEAL OPENINGS THRU PLENUM ENCLOSURE LEFT BY DEMOLITION. TYP.
 - BASE BID: DISCONNECT EXISTING SUPPLY FANS (S-1 & S-2) FROM EXISTING MCC.
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 - ALTERNATE BID: NEW LOCATION OF DPMECH-4 & DUAL VFD PLC'S IN PREVIOUS MCC LOCATION.
 - ALL WIRING METHODS WITHIN THE AIR HANDLING UNIT PLENUM SHALL BE APPROVED FOR INSTALLATION WITHIN AN AIR HANDLING UNIT PLENUM PER ARTICLE 300.22 OF THE NEC.
 - ALL WIRING BETWEEN VFD CONTROL PANEL AND MOTORS SHALL BE MADE WITH VFD CABLE. ROUTE FEEDER AS DIRECT AS POSSIBLE.
 - GC TO PROVIDE DRAIN PAN ABOVE VFD CONTROL PANEL.

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 Evanston, Illinois 60201 4446
 847.328.3555 grummanbutkus.com



ELECTRICIAN PLAN - NEW WORK
EVANSTON LIBRARY VENTILATION FAN
UPGRADES BID 22-07
1703 ORRINGTON, EVANSTON, IL

ISSUES & REVISIONS		
NO.	DESCRIPTION	DATE
	ISSUED FOR BID	1/28/22

REVISED

SCALE		
DRAWN	CHECKED	APPROVED
ELB	ELB	ELB
PROJECT NO. P21-0304-00		

1 ELECTRICAL NEW WORK PLAN
 SCALE: 1/4"=1'-0"

E100

P:\PROJECTS\2021\PROJECTS\21-0304 EVANSTON LIBRARY VENTILATION FAN\ELECTRICIAN\11-28-22\ELECTRICIAN.DWG

Registering for DemandStar



We are pleased to announce our membership in the DemandStar network. DemandStar is an online marketplace that connects our suppliers directly to the bids, quotes and RFPs that matter to them.

DemandStar is open and accessible to all businesses and provides instant access to our solicitations. By registering for your complimentary DemandStar account, you will receive:

- **Instant** access to bids, quotes and RFPs
- **Automatic** notifications, right to you inbox, of bids that match the commodity codes you select
- The ability to **quickly view** the contractual terms and scope of work
- All the **forms and documents** you need in one place
- Access to **more government bids** in neighboring cities, counties and states

It's EASY! Get started with these 3 easy steps!

1 REGISTER

Go to:

<https://www.demandstar.com/registration>

Create an Account with DemandStar

You are one step away from picking your free government agency

Email Address

Company Name

I accept the DemandStar [Terms of Use](#) and [Privacy Policy](#)

Next



2 CHOOSE YOUR FREE AGENCY

Type in the name of the government agency you'd like to add, for example "City of Metropolis" in the Search Box

3 CHECK OUT

Check out with your **FREE AGENCY** Registration by clicking "Skip for now" on the page where it gives you options to add additional counties and States

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Receive full access to the government agency of your choice and receive advance notifications of new opportunities.

City of Metropolis ✕

Narrow down your search by selecting a state and county.

State	County
Select State ▼	Select County ▼

- City of Metropolis – Board of Commisioners
- City of Metropolis Purchasing
- Metropolis Technical College

You have chosen **Metropolis Technical College** as your free agency.
Add additional government agencies below for \$25 per County,
Statewide and National subscriptions available.

My Subscriptions  [0]

Nation (0)

States (0)

Counties (0)

		Your Current Rate
Total	(0 subscriptions)	\$0/year

Proceed to Checkout

Skip for Now

SIGN UP

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DEMANDSTAR

B u i l d i n g C o m m u n i t i e s .

(E-bidding) Electronic Bidding Instructions

Introduction

To submit a bid electronically (e-bidding) on DemandStar

- The project **MUST** be setup for e-bidding by the government agency advertising the opportunity

Bid Identifier	Agency Name	Bid Status	Broadcast Date	Date Due ▼	Name	Actions
RFP-2019-01-0-2019/df	Town of Malabar	Active	5/15/2019	5/31/2019	Malabar Parks and Recreation Board Memorial Wall Project	Planholders, Download/Order, Details
EBID-20190077-0-2019/HF	City of Port St. Lucie, Procurement Management Department	Active	4/25/2019	5/31/2019	Purchase Breaching "Backpack" Gas Masks and Gas Mask Cartridges for the Police Department JAG Grant Funded	E-Bidding, Planholders, Download/Order, Details



How to check if it is an e-bidding opportunity

- Not all opportunities posted on DemandStar by government are available for e-bidding
- Those that are available for you to electronically bid will list "e-bidding" as an available "ACTION" when you look at the project details

In order to do
e-bidding

1. Click on “E-bidding” in
the actions column

Bid Identifier	Agency Name	Bid Status	Broadcast Date	Date Due ▼	Name	Actions
RFP-2019-01-0-2019/df	Town of Malabar	Active	5/15/2019	5/31/2019	Malabar Parks and Recreation Board Memorial Wall Project	Planholders, Download/Order, Details
EBID-20190077-0-2019/HF	City of Port St. Lucie, Procurement Management Department	Active	4/25/2019	5/31/2019	Purchase Breaching “Backpa Gas Masks and Gas Mask Cartridges for the Police Department JAG Grant Funded	E-Bidding, Planholders, Download/Order, Details



In order to do
e-bidding

2. Enter your contact information and enter in all required fields

Note: You **MUST** put a number of the “BID AMOUNT” box. However, that number can be 0 so as to allow for a more detailed description of your bid through your uploaded documents.

Contact Information

**indicates required fields*

Company Name *

Address 1 *

Address 2

City *

State *

Postal Code *

Phone *

Fax

Country *

Bid Amount *

Alternate Bid Amount

Notes



In order to do e-bidding

- In the agency required documents section – check the documents you intend on uploading and fulfilling. By checking these boxes this is **ONLY** an acknowledgement of how you will fulfill the requirement. You still have to upload the documents.

Required Documents



The following documents are required by the agency for this project. Please select which documents you will be submitting electronically (online) and which ones you will submit directly to the agency (offline).

Agency Required Documents

Document	None	Online/ Electronic	Offline/ Manual	Not submitting
-	❗	✓	📄	•
Bid Reply	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Checklist	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Subcontractor List	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Current Workload, List of Projects and Completion Dates	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Questionnaire	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drug Free Workplace Form	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In order to do e-bidding

Upload your response documents in an accepted file format

Make sure that you have covered and uploaded all the required documents

E-Bid Response Documents

Agency Name	City of Port St. Lucie, Procurement Management Department
Bid Number	EBID-20190077-0-2019/HF
Bid Name	Purchase Breaching "Backpack" Kits, Gas Masks and Gas Mask Cartridges for the Police Department JAG Grant Funded
Bid Due Date	5/31/2019 3:00:00 PM Eastern time
Bid Opening	14 days, 21 hours, 45 minutes, 5 seconds

No response documents uploaded

Agency Accepted File Formats



Formats

Adobe Acrobat (*.PDF)
Microsoft Excel (*.XLS)
Microsoft Excel (*.XLSX)
Microsoft PowerPoint (*.PPT)
Microsoft Word (*.DOC)
Microsoft Word (*.DOCX)

Upload Electronic Documents

** indicates required fields*



Document Title *

Specify Upload Document *

Choose File No file chosen

(Type the path of the document, or click the Browse button.)


Upload

In order to do e-bidding

Once you decide you've uploaded all your documents that you would like to submit, make sure you click the **NEXT** button at the bottom of the screen

E-Bid Response Documents

Agency Name City of Port St. Lucie, Procurement Management Department
Bid Number EBID-20180218-0-2018/jer
Bid Name Sculpture on Lawn at City Hall Temporary Art Installation
Bid Due Date 1/9/2019 2:00:00 PM Eastern time
Bid Opening 100 days, 1 hour, 20 minutes, 11 seconds

	Document Title	Format	Size	Uploaded	Status	Action
1	 E-Bidding for Suppliers	Microsoft Word	12 Kb	10/1/2018 9:39:50 AM	Complete	View , Remove

Agency Accepted File Formats

Formats
Adobe Acrobat (*.PDF)
Microsoft Excel (*.XLS)
Microsoft Excel (*.XLSX)
Microsoft PowerPoint (*.PPT)
Microsoft Word (*.DOC)
Microsoft Word (*.DOCX)

Upload Electronic Documents

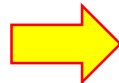
* indicates required fields

Document Title *

Specify Upload Document *

(Type the path of the document, or click the Browse button.)

Your document has successfully uploaded but your response is not yet complete. You must still click 'Submit Response' on Bid Response Details page in order to complete your response and receive a confirmation



Completing your e-bid submittal

- Please **VERIFY** that you have attached **ALL** the required documents
- Click on the **Submit Response** button to complete your e-bid

Agency Required Documents

EDIT

1. **Bid Reply** (Electronic/Online) ✓
2. **Checklist** (Electronic/Online) ✓
3. **Subcontractor List** (Electronic/Online) ✓
4. **Current Workload, List of Projects and Completion Dates** (Electronic/Online) ✓
5. **Questionnaire** (Electronic/Online) ✓
6. **Drug Free Workplace Form** (Electronic/Online) ✓
7. **Current Certificate of Insurance** (Electronic/Online) ✓
8. **License/Certification to do Described Work** (Electronic/Online) ✓
9. **Reference Check Form** (Electronic/Online) ✓
10. **E-Bid Reply Excel Spreadsheet** (Electronic/Online) ✓
11. **E-Bid Bond** (Electronic/Online) ✓
12. **Vendor Code of Ethics** (Electronic/Online) ✓
13. **W-9 form** (Electronic/Online) ✓

Uploaded Documents

EDIT

1. test document upload to ensure e-bidding active

E-Bid Confirmation

After clicking "Submit Response" the following process will begin:

- We will verify that your response is complete as entered.
- You will see a confirmation page with your confirmation number and date/time stamp of your upload.
- You will receive a confirmation e-mail indicating a successful response submittal.
- You may track your response submission under the View Responses page.

If you do not receive any of the above, please call Supplier Services at (206) 940-0305.

<< Return

Submit Response

Confirmation of Response

- When you complete you will receive a confirmation
- This is a confirmation that what you uploaded will be visible to the agency when the bid closes, **this is not** a confirmation that all your documents were fill out or submitted correctly

E-Bid Response Details

Agency Name City of Port St. Lucie, Procurement Management Department

Bid Number EBID-20180218-0-2018/er

Bid Name **Sculpture on Lawn at City Hall Temporary Art Installation**

Bid Due Date 1/9/2019 2:00:00 PM Eastern time

Bid Opening 100 days, 1 hour, 6 minutes, 46 seconds

Response # 15104

Results Your bid response is submitted.

<< Return

Post Submission Edits

If you feel like you missed something or need to make a change you can go back to your submittal response and edit your e-bid. By clicking on “DETAILS” then “EDIT” the section you wish

Bid Identifier	Agency Name	Bid Status	Broadcast	Date Due ▼	Name	Status	Actions
EBID-20190077-0-2019/HF	City of Port St. Lucie, Procurement Management Department	Active	4/25/2019	5/31/2019	Purchase Breaching “Backpack” Kits, Gas Masks and Gas Mask Cartridges for the Police Department JAG Grant Funded	Incomplete	Details, Bid, History

Contact Information

[EDIT](#)

Company Name Sample DBE Company
Address 1 509 Olive Way
Address 2
City Seattle
State Washington
Postal Code 98101
Phone 2063739233
Fax 2063739233
Country United States of America
Bid Amount \$0.00
Alternate Bid Amount
Notes



Agency Required Documents

[EDIT](#)

1. Bid Reply (Electronic/Online) ✓



DemandStar E-Bidding: Frequently Asked Questions

- Do suppliers need to be registered with DemandStar to participate in e-bidding?
Yes. But if they don't already have an account with DemandStar, they can sign up and either
 - Be a subscriber for only your agency, at no charge, and be able to download documents at no charge and then receive notifications that match their commodity codes
 - Be a "basic supplier" for free - who researches on our platform and then pays \$5 to download all documents, thus becoming a plan holder
 - Be a paid subscriber for a county, state, national and receive notifications from all included agencies
- Can suppliers respond with document uploads or do they simply fill in forms?
Yes, they may respond with document uploads that are available to you via the DemandStar platform.
- What type of E-Bidding Documents can be uploaded?
Acceptable file formats for sending back documents that the city will accept:

E-Bidding Documents

Document Types	Bidding Documents - Exhibits Pricing Bid Bond
File Formats	Adobe Acrobat (*.PDF) Microsoft Excel (*.XLS) Microsoft Excel (*.XLSX) Microsoft PowerPoint (*.PPTX) Microsoft PowerPoint (*.PPT) ZIP Compressed Archive (*.ZIP)

- Is there a maximum file size that I can upload?
Vendors can simply upload a single file or multiple documents as long as it doesn't exceed 100 MBs (single or multiple files)
- After a bid opening, what document(s) are made public by DemandStar?
None. Only the agency can see the vendor responses so you are the only ones who will determine what you want to download and make public.
- Who do I call if I have questions or problems with the DemandStar?
The City strongly encourages each respondent to setup their account and to explore the eBidding module at least a couple of days before the bid due date.

If you have questions or issues creating your account, accessing the eBidding module or submitting your bid prior to the bid due date, please contact DemandStar at 866.273.1863 or by email at hello@demandstar.com.
