Oak Brook Park District

Family Aquatic Center
HVAC & Deck Project

Bid Packet

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INVITATION TO BID
OAK BROOK PARK DISTRICT
FAMILY AQUATIC CENTER HVAC & DECK PROJECT

The Oak Brook Park District (the "District") is accepting bids for the Family Aquatic Center HVAC & Deck Project.

Specifications and Contract Documents may be obtained beginning December 1, 2022, at the Administrative Office at the District's Family Recreation Center, 1450 Forest Gate Road, Oak Brook, IL 60523, Monday - Friday, 9:00 a.m. – 5:00 p.m., or in PDF format at the District's website: http://www.obparks.org/general_information/bid.asp. Specifications and Contract Documents may also be examined at the offices of Kluber Architects + Engineers, 41 W. Benton Street, Aurora, Il 60506.

Each bid must be placed in a sealed opaque envelope with the Bidder's name, the date and time of the bid deadline and marked "**Sealed Bid**: – Oak Brook Park District Family Aquatic Center HVAC & Deck Project," and addressed to the Oak Brook Park District, 1450 Forest Gate Road, Oak Brook, IL 60523, **Attention: Executive Director.** Bids will be received until 10:00 a.m. on December 14, 2022 at which time the bid proposals will be publicly opened and read aloud at the District's Administrative Office, located at the District's Family Recreation Center, 1450 Forest Gate Road, Oak Brook, IL 60523.

A mandatory pre-bid meeting will be held for this Project in the Family Recreation Center, 1450 Forest Gate Road, Oak Brook, IL 60523, on December 6, 2022 at 11:00 a.m.

The Oak Brook Park District Board of Park Commissioners reserves the right to waive all technicalities, to accept or reject any or all bids, to accept only portions of a proposal and reject the remainder without disclosure for any reason. Failure to make such a disclosure will not result in accrual of any right, claim or cause of action by any Bidder against the Oak Brook Park District.

Bids shall not include federal excise tax or state sales tax for materials and equipment to be incorporated in, or fully consumed in the performance of, the work. An Exemption Certificate will be furnished by the Oak Brook Park District on request of the Bidder, for use in connection with this project only.

The Work of this Project is subject to the Illinois *Prevailing Wage Act*, 820 ILCS 130/0.01 *et seq*. A prevailing wage determination has been made by the Illinois Department of Labor for public works projects in DuPage County. The Contract entered into for the Work will be drawn in compliance with said law and proposals should be prepared accordingly and provide for payment of all laborers, workmen, and mechanics needed to perform theWork at no less than the prevailing rate of wages (or the prevailing rate for legal holiday and overtime work) foreach craft, type of worker, or mechanic.

All bid proposals must be accompanied by a bid bond or bank cashier's check payable to the Oak Brook Park District for ten percent (10%) of the amount of the bid as provided in the Instructions to Bidders. No proposals or bids will be considered unless accompanied by such bond or check.

The Contractor selected will also be required to comply with all applicable federal, state and local laws, rules, regulations and executive orders including but not limited to those pertaining to equal employment opportunity. The District encourages women and minority business firms to submit bids and encourages bidders to utilize minority businesses for supplies, equipment and services.

Laure Kosey, Executive Director
Oak Brook Park District

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INSTRUCTIONS TO BIDDERS
OAK BROOK PARK DISTRICT
FAMILY AQUATIC CENTER POOL HVAC & DECK PROJECT

INSTRUCTIONS TO BIDDERS

The Oak Brook Park District and Owner are one and the same. "Architect" or "Engineer" shall mean Kluber, Inc. which shall, through its designated representative, Charli Johnsos, cjohnsos@kluberinc.com, respond to questions and provide interpretations of the Specifications for this Project.

The words "Contractor" and "Bidder" shall mean the party bidding for or entering the Contract for the performance of the Work covered by the written Specifications and Drawings, and his/her legal representatives or authorized agents.

A. BID DOCUMENTS

1. The Bid Documents may be downloaded in PDF format from the Owner's website: https://www.obparks.org/bids-rfps. The Bid Documents are also available in printed format from the Administrative Office at the District's Family Recreation Center, 1450 Forest Gate Road, Oak Brook, IL 60523, Monday - Friday, 9:00 a.m. – 5:00 p.m. Please note the printed Drawings available at the Administration Office will be on 11" x 17" paper.

   The Bid Documents may also be examined at the Architect's office, located at 41 W. Benton, Auror, IL 60506.

2. A mandatory pre-bid meeting will be held for this Project in the Family Recreation Center, 1450 Forest Gate Road, Oak Brook, IL 60523, on December 6, 2022 at 11:00 a.m.

B. BID FORM

1. Each bid shall be made on the "Bid Form" furnished by the District. The Bid Form shall be executed properly and all writing, including all signatures, shall be with black ink. Failure to use the Bid Form provided could result in rejection of the bid.

2. All applicable blank spaces on the "Bid Form" shall be fully completed, including the List of Subcontractors and the Bidder's Reference List, and all amounts shall be in words as well as in figures where applicable.

3. The bid shall bear the legal name of the business organization. The signatures shall be in longhand and executed by a duly authorized official of the Bidder's organization and the name of the official and title shall be typed below the signature.

4. Erasures, interlineations, corrections, or other changes on the "Bid Form" shall be explained or noted over the signature of the Bidder. No bid submitted with deviations or reservations from the full contract called for will be considered.

5. Bidders' prices are to include the delivery of all materials; including plant, equipment, supplies, tools, scaffolding, transportation, insurances, bonds, warranties, and all other items and facilities, and the performance of all labor and services, necessary for the proper completion of the Work except as may be otherwise expressly provided in the Contract Documents. Bids shall not include federal excise tax or state sales tax for materials to be incorporated in, or totally consumed in the prosecution of, the Work. An exemption certificate will be furnished by the Park District upon request of the Bidder.

6. Bidder must acknowledge all Addenda received in the spaces provided on the Contractor Bid Form. By submitting a bid, Bidder indicates that all considerations issued by Addendum are incorporated in the bid.

7. Attached to the Bid Form will be the Contractor's Compliance and Certification Attachment/ Substance Abuse Prevention Program Certification regarding the Bidder's compliance with applicable laws. **Failure of a Bidder to complete/submit a required certification shall be the basis for immediate rejection of that Bidder's bid**. The certification of the successful Bidder shall become a part of the Contract with the Park District.

8. The bids shall be sealed in an opaque envelope, marked with the name of the Bidder, the date and time of the bid, and addressed as follows:

   Sealed Bid: Family Aquatic Center Pool HVAC & Deck Project
   Project No. 22-310-1444
   Oak Brook Park District
   1450 Forest Gate Road
   Oak Brook, IL 60523

9. Bid documents shall be delivered or mailed in time for delivery to the foregoing address no later than December 14, 2022 at 10:00 a.m. Oral bids or oral modifications to bids will not be considered. It is the sole responsibility of the Bidder to see that his bid is received in proper time. **No faxed or e-mail bid or modification of a bid will be considered**. The Park District is not responsible for the premature opening of bids not marked as required. Any bid opened prematurely due to the failure of the Bidder to mark the envelope in accordance with these Bid Documents will be considered non-responsive.

10. No bid can be withdrawn prior to the opening of the bids unless a written request for any such withdrawal, showing good cause for said withdrawal, is first delivered to the District at the foregoing address prior to commencement of the opening of bids. No Bidder may withdraw a bid after opening of the bids.

11. Bids will be publicly opened on the due date.

C. REQUIREMENTS OF BIDDERS

Bidders must be able to demonstrate that they: a) have experience in performing and have successfully performed and are still actively engaged in performing work similar in kind and scope to the Work of the Project; and b) are able to show that they have adequate laborers and materials to successfully complete the Work as indicated in the Bid Documents and within the time required by the Bid Documents. The Contractor shall not have been debarred or determined ineligible for public contracts by any governmental agency.

The following information must be attached to the bid proposal. Failure to do so may result in disqualification of the Bidder.

1. On a separate sheet, list all construction projects your organization has in progress, giving the name of the project, project description, project address, owner and telephone number, architect and telephone number, contract amount, percent complete, and scheduled completion date.

2. On the Bidder's Reference List form provided herein, list at least three (3) construction projects your organization has completed in the past five (5) years, which are comparable in scope, giving the name of the project, project description, project address, owner and telephone number.

3. On the List of Subcontractors form provided herein, provide a list of anticipated subcontractors, if any, including their firm names, addresses and telephone numbers. All subcontractors to be used shall be approved by the Owner. If the Contractor subcontracts any part of the Work for this project, the Contractor shall not under any circumstances be relieved of his liabilities and obligations; any subcontractor for this project will be recognized only in the capacity of an employee of the Contractor.

4. On a separate sheet, list all administrative proceedings and litigation filed by or against Bidder in the past five (5) years, including the name and case number, name/jurisdiction of the court or administrative agency, and a summary of each claim/case, including current status and if no longer pending, the disposition. The foregoing includes but is not limited to information regarding any proceedings and actions taken by any governmental agency to debar or disqualify the Bidder from bidding on public contracts, including the name of the agency initiating the proceeding/action, the nature of the proceeding/action, the claimed basis for the proceeding/action and the current status or disposition of the proceeding/action.

5. On a separate sheet, provide a list of all contracts to which you were a party and with respect to which you were declared to be in breach of one or more provisions, giving a the type of contract, the project location where applicable, the names and addresses of the parties to the contract, the name of the party declaring the breach, the nature of the claimed

breach and current status or resolution of the claim. If a construction contract, also provide the name, address and telephone number of the architect and, if applicable also the construction manager or Owner's representative.

Other required submittals include: Bid Form; Contractor's Compliance and Certification Attachment/ Substance Abuse Prevention Program Certification. **Failure of a Bidder to complete/submit these documents shall be the basis for immediate rejection of that Bidder's bid**.

The Park District reserves the right to require of any Bidder such information to verify the Bidder's qualifications and financial status and to withhold formal signing of the contract until such information is received.

D. MODIFICATION OF BIDS

Any Bidder may modify his bid by written notice (signed by the Bidder) at any time prior to the scheduled closing time for receipt of bids, provided that such written notice is received by the District prior to the closing time. Modifications of bid submittals sent by facsimile will not be permitted.

E. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

Each Bidder shall visit the site(s) of the proposed Work and fully acquaint himself with conditions, as they exist, and shall undertake such additional inquiry and investigation as he shall deem necessary so that he may fully understand the requirements, facilities, possible difficulties and restrictions attending the execution of the Work under the Contract. Bidder shall thoroughly examine and be familiar with all of the Bid Documents including, but not limited to, the Drawings and the written Specifications. Any conflicts or discrepancies found between or among Bid Documents including, but not limited to, the Drawings and written Specifications and the site conditions, or any errors, omissions or ambiguities in the Drawings or written Specifications shall be immediately reported to the Architect and written clarification requested prior to submission of a bid.

The failure or omission of any Bidder to obtain, receive or examine any form, instrument, or information or to visit the Project site(s), and become knowledgeable with respect to conditions there existing, or to seek needed clarification shall in no way relieve any Bidder from any obligations with respect to his bid. By submitting a bid, the Bidder agrees, represents and warrants that he has undertaken such investigation as he deemed necessary, has examined the site(s) and the Bid Documents, has obtained all needed clarifications and where the Bid Documents indicate in any part of the Work, that a given result be produced, that the Bid Documents are adequate and the required result can be produced as indicated in the Specifications and Drawing(s). Once the award has been made, failure to have undertaken and completed the foregoing tasks shall not be cause to alter the original Contract or to request additional compensation.

F. ACCEPTANCE OR REJECTION OF BIDS

The Park District may accept the bid of, and award the contract for the Work to, the lowest responsive and responsible Bidder as determined by and in the sole discretion of the Park District.

The Owner reserves the right to (1) reject all bids; (2) reject only certain bids which are non-conforming or non-responsive to the bid requirements; (3) accept only a portion, part or specific items of Work of all and reject others, as the Owner shall in its sole discretion determine to be in its best interest; and/or (4) award the Contract to the responsible Bidder submitting the lowest bid responsive to the bidding requirements. 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 Park District upon any debt or contract, or that is a defaulter, as surety or otherwise, upon any obligation to said Park District or that has failed to perform faithfully any previous contract with the Park District.

In the event of a rejection of a portion, part, or certain items of Work of all bids, the bid of each Bidder shall automatically be deemed reduced by the amount of such rejected part or item at the unit price or other cost designated therefore by that Bidder on its submitted Contractor Bid Form. The successful Bidder so selected may not refuse to enter into a Contract with the Owner on the basis that the Owner awarded a Contract for less than all portions or items of the Work specified in the Bid Documents. The Oak Brook Park District Board of Park Commissioners reserves the right to waive any technicalities or irregularities, and to disregard any informality on the bids and bidding, when in its opinion the best interest of the Park District will be served by such actions and in accordance with applicable law.

G. SURETY

All bids must be accompanied by a bid bond or bank cashier's check payable to the Oak Brook Park District for ten percent (10%) of the amount of the bid and drawn on a responsive and responsible bank doing business in the United States. All bids not accompanied by a bid security, when required, will be rejected.

The bid security of all except the three (3) lowest responsible Bidders will be returned after the decision to accept or reject bids by the Oak Brook Park District Board of Park Commissioners. The bid security of the three (3) lowest responsible Bidders will be returned after acceptance by the Park District from the successful Bidder, an acceptable Performance Bond, Labor and Materials/Payment Bond and a certificate of insurance naming the Oak Brook Park District as the certificate holder and as additional insured, and the successful Bidder has executed and returned to the Park District the Contract for the Work presented by the Park District.

Prior to beginning Work, the successful Bidder shall furnish a Performance Bond, and Labor and Materials/Payment Bond in the amount of 110% of the Contract Sum, using a form similar

to the AIA-A312-2010 form, or its current equivalent, or one acceptable to Owner, cosigned by a surety company licensed to conduct business in the State of Illinois and with at least an "A" rating and a financial rating of at least "X" in the latest edition of the Best Insurance Guide. Said bond shall guarantee the faithful performance of the Work in accordance with the Contract, the payment of all indebtedness incurred for labor and materials, and guarantee correction of Work. The cost of each bond shall be included in the Contract Sum. The Bidder and all Subcontractors shall name the Park District as an obligee on all bonds. Said bonds shall meet the requirements of the Illinois Public Construction Bond Act, 30 ILCS 550/0.01 *et seq.* and any further amendments thereto. Bidder shall include in its Performance Bond and Labor and Material Payment Bond such language as shall guarantee the faithful performance of the Prevailing Wage Act as required in these Bid Documents.

The Performance Bond and Labor and Material Payment Bond will become a part of the Contract. The failure of the successful Bidder to enter into the Contract and supply the required bonds and evidence of insurance within ten (10) days after the Contract is presented for signature, or within such extended period as the Park District may grant, shall constitute a default, and the Park District may either award the Contract to the next responsible Bidder, or re-advertise for bids. In the event of a default, the Owner need not return the defaulting Bidder's bid surety and may charge against the defaulting Bidder for the full difference between the amount for the bid and the amount for which a Contract for the Work is subsequently executed, irrespective of whether the amount thus due exceeds the amount of the defaulting Bidder's bid surety, provided that the District's retention of the bid guarantee shall not preclude the District from holding the Bidder fully liable for any and all damages which are in excess of said partial liquidated damages, and which shall otherwise be incurred by the District, including reasonable attorneys' fees, arising from the Bidder's failure to enter into said Contract and to deliver the same back to the District within said ten (10) day period.

In addition to the required performance and labor and material payment bonds, the successful Bidder shall furnish a maintenance bond and/or irrevocable letter of credit in the amount of the Contract to guarantee the Work performed under the Contract against defective workmanship and/or defective materials of any nature for a period of not less than twenty-four (24) months from the date of acceptance of the Work, materials or equipment provided. The maintenance bond shall be in a form acceptable to District. A letter of credit furnished in lieu of maintenance bond shall be in a form designated by the District's attorneys. The District reserves the right to waive the maintenance bond in its own interests.

H. WITHDRAWAL OF BID

Bidders may withdraw or cancel their bids at any time prior to the advertised bid opening time by signing and submitting a request for said withdrawal. After the bid opening time, no bid shall be withdrawn or canceled for a period of sixty (60) calendar days.

I. ACCEPTANCE AND CONTRACT

Owner will award the Contract to the lowest most responsible and responsive Bidder, as determined by Owner. In considering the Bidder's responsibility, the Owner may evaluate, among other factors, the ability of the Bidder to provide experienced labor sufficient in numbers to timely and properly complete the services, conformity with the Specifications, serviceability, quality, and the financial capability of the Bidder, and the performance of the Bidder on other projects.

The Owner shall have the right to accept Alternates in any order or combination, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

Bids will be awarded to one Bidder for the entire Project or to any series of Bidders for an appropriate proportion of the Project. If specified in the Bid Form, awards will be based upon the submitted unit prices.

The acceptance of a bid will be by a Notice of Award, signed by a duly authorized representative of the Park District; no other act by the Park District shall constitute the acceptance of a bid. The acceptance of a bid by the Park District shall bind the successful Bidder to execute and perform the Work of the Contract. The successful Bidder to whom the Contract is awarded by the Park District shall sign and deliver to the Park District for execution by the Park District all required copies of the Contract, along with all required insurance and surety documents within ten (10) days after presentation to him of the Contract for signature. In case the Bidder shall fail or neglect to do so, he will be considered as having abandoned the Contract, and as being in default to the Owner. The Owner may thereupon re-advertise or otherwise award said Contract and forfeit the Bid Security.

The Advertisement for Bids, Instructions to Bidders, General Conditions, Supplementary and/or Special Conditions, if any, Drawings, Specifications, Contractor Bid Form, Addenda, if any, Contractors Compliance and Certifications Attachment, and Substance Abuse Certification and the Prevailing Wage Determination and Supersedes Notice comprise the Bid Documents. The Bid Documents, together with the Standard Abbreviated Form of Agreement Between Owner and Contractor, AIA Document A104-2017, as modified by the Park District and included in these Bid Documents, and the Performance Bond and Labor Material Payment Bond and proof of insurance comprise the Contract Documents.

J. INTERPRETATION OF THE CONTRACT DOCUMENTS

The Park District shall in all cases determine the amount or quantity of the several kinds of Work which are to be paid for under this Contract, and shall decide all questions which may arise relative to the execution of the Contract on the part of the Contractor, and all estimates and decisions shall be final and conclusive. The Park District shall have the right to make alterations in the lines, grades, plans, forms, or dimensions of the Work herein

contemplated either before or after the commencement of the Work. If such alterations diminish the quantity of the Work to be done, they shall not constitute a claim for damage or for anticipated profits on the work dispensed with, or if they increase the amount of Work, such increase shall be paid according to the quantity actually done and at the price or prices stipulated for such Work in the Contract. The Park District reserves the right to approve, an equal to or superior to product or equipment required under the Specifications, or to reject as not being and equal to or superior to the product or equipment required under the Specifications. If the Bidder is in doubt as to the interpretation of any part of the Bid Documents, or finds errors, discrepancies or omissions from any part of the Contract Documents, he must submit a written request for interpretation thereof not later than seven (7) days prior to opening of bids to the Park District. Address all communications to the Architect. If an error or omission is discovered in the Bid Documents after the bid opening, the Park District reserves the right: 1) to determine whether to require the submission of new bids; or 2) if the error or omission is of such a nature that it was reasonably discoverable upon a careful review of the Bid Documents, to award the Contract to the lowest responsive and responsible Bidder as determined by the Park District and to require that Contractor to perform the Work in accordance with an issued correction by the Park District and for the amount bid by the Contractor. Such decisions are final and not subject to recourse. Errors and omissions made by the Bidder cannot be corrected after the bid opening.

K. ADDENDA

Any interpretation, correction to, or addition to the Bid Documents will be made by written Addendum and will be delivered to each prime Bidder of record. The written Addenda constitute the only interpretations of the Bid Documents; the Park District accepts no responsibility for any other claimed interpretations or communications.

It is the responsibility of each Bidder to verify that he has received all Addenda prior to submitting a bid. It is also the responsibility of each Bidder to verify that all subcontractors and material suppliers whose prices are incorporated in the Bidder's bid are familiar with the Bid Documents in their entirety, including all Addenda issued up to the time of bid opening.

In the event a conflict or omission is discovered in the Bid Documents after the issuing of the last Addendum such that an interpretation cannot be issued by the Architect or Park District prior to bidding, the Bidder is directed to estimate on and provide the quantity and quality of material and labor consistent with the overall represented and indicated Work so as to provide all materials, equipment, labor, and services necessary for the completion of the Work in accordance with the Bid Documents.

L. SUBSTITUTIONS DURING BIDDING

Unless otherwise indicated, the use of brand names in the Specifications is used for the purpose of establishing a grade or quality. Bidders proposing to use an alternate that is equal to or superior to in every respect to that required by the Specifications must request

approval for the proposed substitution by completing and submitting to the Architect the Substitution Request Form included in the Specifications at least seven (7) business days prior to the bid opening.

Additionally, Bidders requesting approval for use of an alternate must provide certification by the manufacturer that the substitute proposed is equal to or superior in every respect to that required by the Contract Documents, and that its in-place performance will be equal to or superior to the product or equipment specified in the application indicated. The Bidder, in submitting the request for substitution, waives the right to additional payment or an extension of Contract Time because of the failure of the substitute to perform as represented in the request for substitution.

The Architect may request additional information or documentation necessary for evaluation of the request for substitution in accordance with Section 01 60 00 Product Requirements of the Specifications. The Architect will notify all Bidders of acceptance of the proposed substitute by means of an Addendum to the Bid Documents. The Architect's approval of a substitute during bidding does not relieve the Contractor of the responsibility to submit required shop drawings and to comply with all other requirements of the Contract Documents, including but not limited to proper performance of all components of the Work and suitability for the uses specified.

Bids proposing alternates not previously approved by the Architect will be considered non-responsive and rejected. The Architect and Park District reserve the right to determine whether a substituted selection, in their judgment, is equal to or better quality and therefore an acceptable alternate. Such decisions are final and not subject to recourse.

CONDITIONS OF THE CONTRACT
OAK BROOK PARK DISTRICT
FAMILY AQUATIC CENTER POOL HVAC & DECK PROJECT

GENERAL CONDITIONS

The General Conditions are the General Provisions of the Standard Abbreviated Form of Agreement Between Owner and Contractor, AIA Document A104-2017, as modified by the Park District and included in these Bid Documents (the "General Conditions").

SUPPLEMENTARY CONDITIONS

The General Conditions are hereby amended to include the following:

1. COMMENCEMENT AND COMPLETION DATE

The Work for the Contract shall commence on August 30, 2023, or on such earlier date as may be agreed upon by the parties. Contractor shall achieve Substantial Completion on or before September 18, 2023, unless otherwise extended by agreement of the parties pursuant to the General Conditions.

2. USE OF THE SITE

The Contractor shall confine all equipment, the storage of materials and the operations of its workers, to limits indicated by law, ordinances, permits, or directions of the Owner and shall not unreasonably encumber the site with such materials. The site shall not be utilized for the storage of vehicles, materials, equipment, or fixtures not intended for the Work to be performed.

3. COOPERATION WITH UTILITIES

The Contractor shall notify all utility companies, public and private, as necessary in advance of commencing performance of the Work. The responsibility for moving water lines, gas lines, wire lines, service connections, water and gas meter boxes, water and gas valve boxes, light standards, cable ways, signals and all other utility appurtenances which are within the limits of the proposed construction will be assumed by the Contractor, at no additional compensation.

The Contractor shall verify the location of all utilities prior to the start of construction and shall be responsible for the preservation of existing utility installation and the cost of providing precautionary supports, braces, etc. to insure against damage to said utility installation.

The cost to repair and replace any new or existing utilities damaged will be paid for by the Contractor.

It is understood and agreed that the Contractor has considered in its bid all of the permanent and temporary utility appurtenances in their present or relocated positions and that no additional compensation will be allowed for delays, inconvenience, or damage sustained by the Contractor, due to any interference from the said utility appurtenances or the operation of moving them either by the utility company or by the Contractor, or on account of any special construction methods required in performing the Work due to the existence of said appurtenances whether in their present or relocated positions.

4. PROTECTION OF PROPERTY -SAFETY RESPONSIBILITY

In accordance with the Specifications, the Contractor shall protect all existing property and improvements within the Project site and those adjacent to the Owner's property in a manner agreed upon between the Owner and Contractor. The Contractor shall be responsible for the repair cost of any damage created by its operations or the operations of any subcontractors.

Contractor shall comply with State and Federal regulations as outlined in the latest revision of the Federal Construction Safety Standards and with applicable provisions and regulations of Occupation Safety and Health Administration (OSHA), Standards of the William-Steiger Occupational Health and Safety Act of 1970 (revised). The Contractor and Owner shall each be responsible for their respective agents and employees.

The Contractor shall be obligated to indemnify, hold harmless and protect the Owner, its officers, employees and agents, from any actions or suits instituted as a direct or indirect result of any injury or damage consequent upon any failure to use or misuse by the Contractor, its agents and employees and any subcontractor, its agents and employees, of any ladder, support or other mechanical contrivance erected or constructed by any person or any or all kinds of equipment whether or not Owner or furnished by the Owner.

5. INSURANCE

BIDDER'S ATTENTION IS DIRECTED TO THE INSURANCE REQUIREMENTS BELOW. IT IS HIGHLY RECOMMENDED THAT THE BIDDER CONFER WITH ITS INSURANCE CARRIER REGARDING THESE REQUIREMENTS. FAILURE TO MEET THESE REQUIREMENTS IS CAUSE FOR CANCELLATION OF THE CONTRACT.

The successful Bidder shall obtain insurance of the types and in the amounts listed below.

a. Commercial General and Umbrella Liability Insurance

The successful Bidder shall maintain commercial general liability (CGL) and, if necessary, commercial umbrella insurance with a limit of not less then $2,000,000 each occurrence. If such CGL insurance contains a general aggregate limit, it shall apply separately to this project/location.

CGL insurance shall be written on Insurance Services Office (ISO) occurrence form CG 00 01 04 13, or a substitute form providing equivalent coverage, and shall cover liability arising from premises, operations, independent contractors, products-completed operations, personal injury and advertising injury, and liability assumed under an insured contract (including the tort liability of another assumed in a business contract).

The successful Bidder shall purchase insurance to cover claims and expenses, including costs of defense, asserted against Architect, its agents, employees and consultants for bodily injury, sickness, disease or death to the extent caused by any negligent act or omission of the successful Bidder any subcontractor, anyone directly or indirectly employed by them or anyone for whose act of them may be liable.

The District, its elected and appointed officials, employees, agents and volunteers and Architect shall be included as an additional named insured under the CGL, using ISO additional insured endorsement CG 20 26 or a substitute providing equivalent coverage, and under the commercial umbrella, if any. The coverage afforded the additional insureds shall apply as primary insurance for the additional insured with respect to claims arising out of operations performed by or on behalf of the successful Bidder. If the additional insureds have other self-insurance or insurance which is applicable to the loss, such other self-insurance or insurance shall be on an excess or contingent basis. Any self- insurance maintained by the District or insurance maintained by Architect shall be deemed excess of such Bidder's insurance and shall not contribute with it. The amount of the successful Bidder's liability under this insurance policy shall not be reduced by the existence of such other insurance.

b. Continuing Completed Operations Liability Insurance

The successful Bidder shall maintain commercial general liability (CGL) and, if necessary, commercial umbrella liability insurance with a limit of not less than $2,000,000 each occurrence for at least three years following Substantial Completion of the Work.

Continuing CGL insurance shall be written on ISO occurrence form CG 00 01 04 13, or substitute form providing equivalent coverage, and shall, at minimum, cover liability arising from products-completed operations and liability assumed under an insured contract.

Continuing CGL insurance shall have a products-completed operations aggregate of at least two times its each occurrence limit.

Continuing commercial umbrella coverage, if any, shall include liability coverage for damage to the insured's completed work equivalent to that provided under ISO form CG 00 01.

c. Business Auto and Umbrella Liability Insurance

The successful Bidder shall maintain business auto liability and, if necessary, commercial umbrella liability insurance with a limit of not less than $1,000,000 each accident. Such insurance shall cover liability arising out of any auto including owned, hired and non-owned autos.

Business auto insurance shall be written on Insurance Services Office (ISO) form CA 00 01, CA 00 05, CA 00 12, CA 00 20, or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to that provided in the 1990 and later editions of CA 00 01.

d. Workers Compensation Insurance

The successful Bidder shall maintain workers compensation and employers liability insurance. The commercial umbrella and/or employers liability limits shall not be less than $1,000,000 each accident for bodily injury by accident or $1,000,000 each employee for bodily injury by disease.

Such Bidder waives all rights against District and its officers, officials, employees, volunteers and agents for recovery of damages arising out of or incident to such Bidder's activities.

e. General Insurance Provisions

i. Evidence of Insurance: The successful Bidder shall furnish the District with a certificate(s) of insurance and applicable policy endorsement(s), executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements set forth above.

All certificates shall provide for 30 days' written notice to the District prior to the cancellation or material change of any insurance referred to therein. Written notice to the District shall be by certified mail, return receipt requested.

Failure of the District to demand such certificate, endorsement or other evidence of full compliance with these insurance requirements, or failure of the District to identify a coverage deficiency from evidence that is provided, shall not be construed as a waiver of such Bidder's obligation to maintain such insurance.

The District shall have the right, but not the obligation, of prohibiting such Bidder from entering the premises until such certificates or other evidence that insurance has been placed in complete compliance with these requirements is received and approved by District.

Failure to maintain the required insurance may result in termination of the Contract entered by the parties at the District's option.

Such Bidder shall provide certified copies of all insurance policies required above within 10 days of the District's written request for said copies.

ii. Acceptability of Insurers: All insurance companies shall maintain a rating no less than A-VII from A.M. Best, based on the most recent edition of the A.M. Best's Key Rating Guide. If the Best's rating is less than A-VII or a Best's rating is not obtained, the District has the right to reject insurance written by an insurer it deems unacceptable.

iii. Deductibles and Self-Insured Retentions: Any deductibles or self-insured retentions must be declared to the District. At the option of the District, the successful Bidder may be asked to eliminate such deductibles or self-insured retentions as respects the District, its officers, officials, employees, volunteers and agents, or such Bidder may be required to procure a bond guaranteeing payment of losses and other related costs, including, but not limited to, investigations, claims administration and defense expenses.

f. Subcontractors

Contractor shall cause each subcontractor employed by Contractor to purchase and maintain insurance of the type specified above. When requested by the Owner, Contractor shall furnish copies of certificates of insurance evidencing coverage for each subcontractor.

6. INDEMNIFICATION

To the fullest extent permitted by law, the successful Bidder shall waive any right of contribution and shall indemnify and hold harmless the Owner and its officers, officials, employees, volunteers and agents and Architect and its employees and consultants from and against all claims, damages, losses and expenses including but not limited to legal fees (attorney's and paralegals' fees and court costs), arising out of or resulting from the performance of the successful Bidder's work, provided that any such claim, damage, loss or expense (i) is attributable to bodily injury, sickness, disease or death, or injury to or destruction of tangible property, other than the work itself, including the loss of use resulting there from and (ii) is caused in whole or in part by any wrongful or negligent act or omission of the successful Bidder, any subcontractor, anyone directly or indirectly employed by any of them

or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Paragraph. The successful Bidder shall similarly protect, indemnify and hold and save harmless the Owner, its officers, officials, employees, volunteers and agents against and from any and all claims, costs, causes, actions and expenses including but not limited to legal fees, incurred by reason of the successful Bidder's breach of any of its obligations under, or the successful Bidder's default of, any provision of the Contract.

In any and all claims against the Owner or Architect, their employees or consultants, by any of successful Bidder's employee, any subcontractor, or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this paragraph of the Contract shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the successful Bidder or any subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefits acts.

Claims, damages, losses and expenses' as these words are used in the Contract shall be construed to include, but not to limited to (1) injury or damage consequent upon the failure of or use or misuse by the successful Bidder, its subcontractors, agents, servants or employees, of any hoist, rigging, blocking, scaffolding or any and all other kinds of items of equipment, whether or not the same be owned, furnished or loaned by Owner; (2) all attorneys' fees and costs incurred in bringing an action to enforce the provisions of this indemnity or any other indemnity contained in the General Conditions, as modified by any Supplementary General Conditions; and (3) time expended by the party being indemnified and their employees, at their usual rates plus consists of travel, long distance telephone and reproduction of documents.

Nothing contained herein shall be construed as prohibiting the District, its officers, employees or agents from defending, through the selection and use of their own agents, attorneys and experts, any claims, suits, demands, proceedings or actions brought against them. The District's participation in its defense shall not remove the successful Bidder's duty to indemnify, defend and hold the District harmless as set forth herein.

The indemnification required hereunder shall not be limited by reason of the enumeration of insurance coverage herein provided.

The successful Bidder's indemnification of the District shall survive the termination or expiration of the Contract.

7. WARRANTY

A. The Work performed and the materials and equipment installed under this Contract shall be in compliance with the Contract Documents and must be guaranteed by the Contractor and the Surety for a period of twenty four (24) months from Substantial

Completion against defective workmanship and material of any nature. On all material or equipment incorporated, the Contractor and its Surety must guarantee that the type, quality, design and performance will fully meet the requirements of the Specifications and Drawings.

B. The Contractor shall provide the Owner with manufacturer's warranties for all materials and equipment installed under the Contract.

C. A Maintenance Bond or Irrevocable Letter of Credit meeting the requirements set forth in the Instructions to Bidders shall be furnished by the Contractor to guarantee the Work performed, and the materials and equipment provided under the Contract.

SPECIAL CONDITIONS

1. The Family Recreation Center shall remain open to the public for the duration of the Project. As such, Contractor shall maintain the Project site in a manner that ensures safe access to the Family Recreation Center amenities by the public, Park District staff and others requiring access to the Family Recreation Center. Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

BID FORM
OAK BROOK PARK DISTRICT
FAMILY AQUATIC CENTER POOL HVAC & DECK PROJECT

(Please complete in ink, and print or type)

TO: Oak Brook Park District
1450 Forest Gate Road
Oak Brook, IL 60523

FROM: _____
NAME OF BIDDER

_____
STREET ADDRESS

_____
CITY STATE ZIP

_____ _____
PHONE EMAIL ADDRESS

FOR: Family Aquatic Center Pool HVAC & Deck Project

By submission of its bid, the Bidder acknowledges, agrees, represents, declares and warrants:

A. That he has carefully examined the written Specifications and Drawings and is thoroughly familiar therewith, and that he has visited the site of the proposed Work to arrive at a clear understanding of the conditions under which the Work is to be done, and that he has compared the site with the Drawings and Specifications and has satisfied himself as to all conditions affecting the execution of the Work;

B. That all modifications have been submitted with this bid;

C. That he has checked carefully the bid figures and understands that he shall be responsible for any errors or omissions based on these Specifications and alternates as submitted on the Bid Proposal Form;

D. That it is understood and agreed that the Oak Brook Park District reserves the right to accept or reject any or all bids, or to combine or separate any section or work, and to waive any technicalities;

E. To hold the bid open for sixty (60) days subsequent to the date of the bid opening;

F. To enter into and execute a Contract with the Owner within ten (10) days after the date of the Notice of Award, if awarded on the basis of this bid, and in connection therewith to:
(a) Furnish all bonds and insurance required by the Contract Documents;
(b) Accomplish the Work in accordance with the Contract Documents; and
(c) Complete the Work within the time requirements as set forth in the Bid Documents.

G. That if this bid is accepted, the Bidder is to provide all of the necessary equipment, tools, apparatus, labor, and other means of construction, and to do all of the Work and to furnish all of the materials specified in

the Bid Documents in the manner and at the time therein prescribed, and in accordance with the requirements set forth;

H. To commence Work as specified in the Instructions to Bidders, and to prosecute the Work in such a manner, and with sufficient materials, equipment and labor as will ensure its completion within reasonable time, it being understood and agreed that the completion within such reasonable time is an essential part of this Contract;

I. That any and all prices stated in the proposal include all costs of labor, materials, equipment, insurance, bonds, overhead and profit, and any and all other costs normal to doing business.

The undersigned Bidder agrees to perform the Work for the following lump sum price:

Base Bid	**Amount**
	$

Total Lump Sum Bid: _____

Bids will be awarded to one Bidder for the entire Project or to any series of Bidders for an appropriate proportion of the Project. The Owner shall have the right to accept Alternates in any order or combination, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

The undersigned Bidder hereby acknowledges the receipt of the following addenda (if any) distributed by the Park District.

Addendum No. _____ Date:_____
Addendum No. _____ Date:_____

The Work for the Contract shall commence on August 23, 2023, or on such earlier date as may be agreed upon by the parties. Substantial Completion of the Project shall be on or before September 18, 2023, unless otherwise extended by agreement of the parties pursuant to the General Conditions.

The undersigned Bidder agrees that if this bid is accepted by the Park District, it will perform all Work in accordance with the requirements of the Contract.

DATED THIS _____ DAY OF _____, 2022.

_____
Full Name of Bidder (Print)

(a) Individual ( )
(b) Partnership ( )
(c) Corporation ( )

Name and Title of Authorized Agent
if Corporation or Partnership (Print): _____

_____
Full Name and Title of Bidder (Signature)

_____
Street Address

_____
City/State/Zip
Email: _____ Phone _____

LIST OF SUBCONTRACTORS

Bidder submits a list of subcontractors for each trade relative to the Work to be performed under the Contract with the District, and agrees that if selected the successful Contractor, the Bidder will promptly confer with the District's agents on the question of which subcontractors the Bidder proposes to use, including submission of their qualifications. It is agreed that the District may substitute for any proposed subcontractor, another subcontractor for the trade against whose standing and ability the Bidder makes no objection in writing, and the Bidder will use all such finally selected subcontractors at the amount named in their respective subcontracts, and be in every way responsible for them and their work as if they had been originally named in the Bidder's bid, the unit, total and alternate Contract prices being adjusted to confirm thereto.

Subcontractor Name & Address	Classification of Work	Amount of Subcontract
1.		
2.		
3.		
4.		

BIDDER'S REFERENCE LIST

Each Bidder must list the name, address, phone number and project name for at least three (3) projects performed for governmental entities of similar scope and complexity as this Project in the past five (5) years. Bidder may include, as a separate attachment, additional information or references on projects completed.

1. _____
Name of Park District, School District, or Municipality

_____
Contact Person

_____
Phone Number E-Mail

_____
Description of Work performed Project Value

2. _____
Name of Park District, School District, or Municipality

_____
Contact Person

_____
Phone Number E-Mail

_____
Description of Work performed Project Value

3. _____
Name of Park District, School District, Municipality

_____
Contact Person

_____
Phone Number E-Mail

_____
Description of Work performed Project Value

CONTRACTOR COMPLIANCE AND CERTIFICATIONS ATTACHMENT

Note: The following certifications form an integral part of the Agreement between the Owner and Contractor. Breach by Contractor of any of the certifications may result in immediate termination of the Contractor's services by Owner.

THE UNDERSIGNED CONTRACTOR HEREBY ACKNOWLEDGES, CERTIFIES, AFFIRMS AND AGREES AS FOLLOWS:

A. Contractor has carefully read and understands the contents, purpose and legal effect of this document as stated above and hereafter in this document. The certifications contained herein are true, complete and correct in all respects.

B. Contractor shall abide by and comply with, and in contracts which it has with all persons providing any of the services or Work on this Project on its behalf shall require compliance with, all applicable Federal, State and local laws and rules and regulations including without limitation those relating to 1) fair employment practices, affirmative action and prohibiting discrimination in employment; 2) workers' compensation; 3) workplace safety; 4) wages and claims of laborers, mechanics and other workers, agents, or servants in any manner employed in connection with contracts involving public funds or the development or construction of public works, buildings or facilities; and 5) steel products procurement.

C. All contracts for this Project are subject to the provisions of the Illinois Prevailing Wage Act (820 ILCS 130/0.01 *et seq.*), providing for the payment of the prevailing rate of wage to all laborers, workmen and mechanics engaged in the Work. Contractor shall pay prevailing rates of wages in accordance with the Illinois Department of Labor's wage determination and any subsequent determinations issued by the Illinois Department of Labor, all in accordance with applicable law. These revisions may be accessed by computer at http://labor.illinois.gov/. Contractor is responsible for determining the applicable prevailing wage rates at the time of bid submission and at the time of performance of the Work. Failure of Contractor to make such determination shall not relieve it of its obligations in accordance with the Contract Documents. Contractor shall also comply with all other requirements of the Act including without limitation those pertaining to inclusion of required language in subcontracts, job site posting, maintenance and submission of certified payroll records and inspection of records. Contractor is not barred from entering into public contracts under Section 11a of the Illinois Prevailing Wage Act due to its having been found to have disregarded its obligations under the Act.

D. To the best of Contractor's knowledge, no officer or employee of Contractor has been convicted of bribery or attempting to bribe an officer or employee of the State of Illinois, or any unit of local government, nor has any officer or employee made an admission of guilt of such conduct which is a matter of record.

E. Contractor is not barred from bidding on or entering into public contracts due to having been convicted of bid-rigging or bid rotating under paragraphs 33E-3 or 33E-4 of the Illinois Criminal Code. Contractor also certifies that no officers or employees of the Contractor have been so convicted and that Contractor is not the successor company or a new company created by the officers or owners of one so convicted. Contractor further certifies that any such conviction occurring after the date of this certification will be reported to the Owner, immediately in writing, if it occurs during the bidding process, or otherwise prior to entering into the Contract therewith.

F. Pursuant to the Illinois Human Rights Act (775 ILCS 5/2-105), Contractor has a written sexual harassment policy that includes, at a minimum, the following information: (i) a statement on the illegality of sexual harassment; (ii) the definition of sexual harassment under State law; (iii) a description of sexual harassment utilizing examples; (iv) the Contractor's internal complaint process including penalties; (v) the legal recourse, investigative and complaint process available through the Illinois Department of Human Rights and the Human Rights Commission and directions on how to contact both; and (vi) protection against retaliation as provided by Section 6-101 of the Illinois Human Rights Act. Contractor further certifies that such policy shall remain in full force and effect. A copy of the policy shall be provided to the Illinois Department of Human Rights upon request.

G. (i) Contractor's bid proposal was made without any connection or common interest in the profits anticipated to be derived from the Contract by Contractor with any other persons submitting any bid or proposal for the Contract; (ii) the Contract terms are in all respects fair and the Contract will be entered into by Contractor without collusion or fraud; (iii) no official, officer or employee of the Owner has any direct or indirect financial interest in Contractor's bid proposal or in Contractor, (iv) the Contractor has not directly or indirectly provided, and shall not directly or indirectly provide, funds or other consideration to any person or entity (including, but not limited to, the Owner and the Owner's employees and agents), to procure improperly special or unusual treatment with respect to this Agreement or for the purpose of otherwise improperly influencing the relationship between the Owner and the Contractor. Additionally, the Contractor shall cause all of its officers, directors, employees, (as the case may be) to comply with the restrictions contained in the preceding sentence.

H. Contractor knows and understands the Equal Employment Opportunity Clause administrated by the Illinois Department of Human Rights, which is incorporated herein by this reference, and agrees to comply with the provisions thereof. Contractor further certifies that Contractor is an "equal opportunity employer" as defined by Section 2000 (e) of Chapter 21, Title 42 of the United States Code Annotated and Executive Orders #11246 and #11375 as amended, which are incorporated herein by this reference.

I. Neither Contractor nor any substantially owned affiliated company is participating or shall participate in an international boycott in violation of the provisions of the U.S. Export Administration Act of 1979 or the regulations of the U.S. Department of Commerce promulgated under that Act.

J. Contractor is not barred from contracting with the Owner because of any delinquency in the payment of any tax administrated by the Illinois Department of Revenue, unless it is being contested. Contractor further certifies that it understands that making a false statement regarding delinquency in taxes is a Class A misdemeanor and, in addition, voids the Contract and allows the Owner, a municipal entity, to recover in a civil action all amounts paid to the Contractor.

K. If Contractor has 25 or more employees at the time of letting of the Contract, Contractor knows, understands and acknowledges its obligations under the Illinois Drug Free Workplace Act (30 ILCS 580/1 *et seq*.) and certifies that it will provide a drug-free workplace by taking the actions required under, and otherwise implementing on a continuing basis, Section 3 of the Drug Free Workplace Act. Contractor further certifies that it has not been debarred and is not ineligible for award of this Contract as the result of a violation of the Illinois Drug Free Workplace Act.

L. Contractor knows, understands and acknowledges its obligations under the Substance Abuse Prevention on Public Works Act, 820 ILCS 265/1 *et seq.* A true and complete copy of Contractor's

Substance Abuse Prevention Program Certification is attached to and made a part of this Contractor Compliance and Certification Attachment.

M. The Contractor shall comply with the requirements and provisions of the Freedom of Information Act (5 ILCS 140/1 *et. seq*.) and, upon request of the Oak Brook Park District's designated Freedom of Information Act Officer (FOIA Officer), Contractor shall within two (2) business days of said request, turn over to the FOIA Officer any record in the possession of the Contractor that is deemed a public record under FOIA.

CONTRACTOR

By: _____
Its: _____

STATE OF _____)
)SS
COUNTY OF _____)

I, the undersigned, a notary public in and for the State and County, aforesaid, hereby certify that _____ appeared before me this day and, being first duly sworn on oath, acknowledged that he/she executed the foregoing instrument as his/her free act and deed and as the act and deed of the Contractor.

Dated:_____

_____
(Notary Public)

(SEAL)

SUBSTANCE ABUSE PREVENTION PROGRAM CERTIFICATION

The Substance Abuse Prevention on Public Works Projects Act, 820 ILCS 265/1 et seq., ("Act") prohibits any employee of the Contractor or any Subcontractor on a public works project to use, possess or be under the influence of a drug or alcohol, as those terms are defined in the Act, while performing work on the project. The Contractor/Subcontractor **[circle one],** by its undersigned representative, hereby certifies and represents to the Oak Brook Park District that **[Contractor/Subcontractor must complete either Part A or Part B below]**:

A. The Contractor/Subcontractor **[circle one]** has in place for all of its employees not covered by a collective bargaining agreement that deals with the subject of the Act a written substance abuse prevention program, a true and correct copy of which is attached to this certification, which meets or exceeds the requirements of the Substance Abuse Prevention on Public Works Act, 820 ILCS 265/*1 et seq.* **[Contractor/Subcontractor must attach a copy of its substance abuse prevention program to this Certification.]**

_____
Name of Contractor/Subcontractor (print or type)

_____
Name and Title of Authorized Representative (print or type)

_____ Dated: _____
Signature of Authorized Representative

B. The Contractor/Subcontractor **[circle one]** has one or more collective bargaining agreements in effect for all of its employees that deal with the subject matter of the Substance Abuse Prevention on Public Works Projects Act, 820 ILCS 265/1 *et seq.*

_____
Name of Contractor/Subcontractor (print or type)

_____
Name and Title of Authorized Representative (print or type)

_____ Dated: _____
Signature of Authorized Representative

IMPORTANT NOTICE OF RESPONSIBILITY FOR PERIODIC REVISIONS TO PREVAILING WAGE RATES

Revisions of the Prevailing Wage Rates are made periodically by the Illinois Department of Labor (IDOL). As required by the Illinois Prevailing Wage Act, the contractor/subcontractor has an obligation to check IDOL's web site for revisions to prevailing wage rates. These revisions may be accessed by computer at http://labor.illinois.gov/. Bidders and contractors performing work on this Project are responsible for determining the applicable prevailing wage rates at the time of bid submission and performance of the Work. Failure of a bidder/contractor to make such determination shall not relieve it of its obligations in accordance with the Contract Documents. In consideration for the award to it of the contract for this Project, the contractor agrees that the foregoing notice satisfies any obligation of the public body in charge of this Project to notify the contractor of periodic changes in the prevailing wage rates and the contractor agrees to assume and be solely responsible for, as a material obligation of the contractor under the contract, the obligation to determine periodic revisions of the prevailing wage rates, to notify its subcontractors of such revisions, to post such revisions as required for the posting of wage rates under the Act, and to pay and require its subcontractors to pay wages in accordance with such revised rates.

Owner/Contractor Agreement

Please refer to Bid Packet Section 2 - Owner Contractor Agreement for Family Aquatic Center HVAC and Pool Deck.

Technical Specifications

PROJECT MANUAL
FOR

FAMILY REC. CENTER POOL DECK & HVAC RENOVATIONS

OAK BROOK, ILLINOIS

OWNER

OAK BROOK PARK DISTRICT
1450 FOREST GATE ROAD
OAK BROOK, ILLINOIS 60523

ARCHITECT / ENGINEER

KLUBER, INC.
41 WEST BENTON STREET
AURORA, ILLINOIS 60506

DATE: November 28, 2022
PROJECT NO. 22-310-1444

SECTION 00 01 01
PROJECT TITLE PAGE

PROJECT MANUAL

FOR

FAMILY REC CENTER POOL DECK & HVAC RENOVATIONS
1450 OAK FOREST GATE ROAD
OAK BROOK, ILLINOIS

OWNER

OAK BROOK PARK DISTRICT
1450 FOREST GATE ROAD
OAK BROOK, ILLINOIS 60523

ARCHITECT / ENGINEER

KLUBER ARCHITECTS + ENGINEERS
41 W. BENTON STREET
AURORA, ILLINOIS 60506

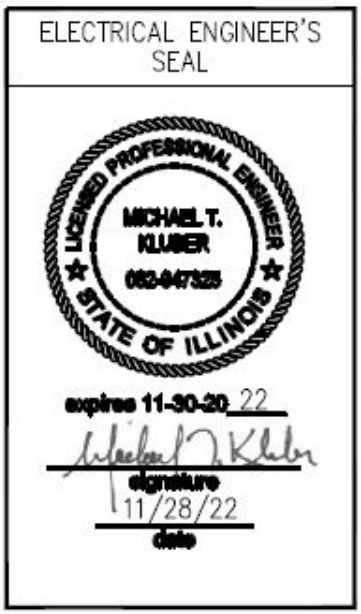
END OF DOCUMENT

SECTION 00 01 07
SEALS PAGE

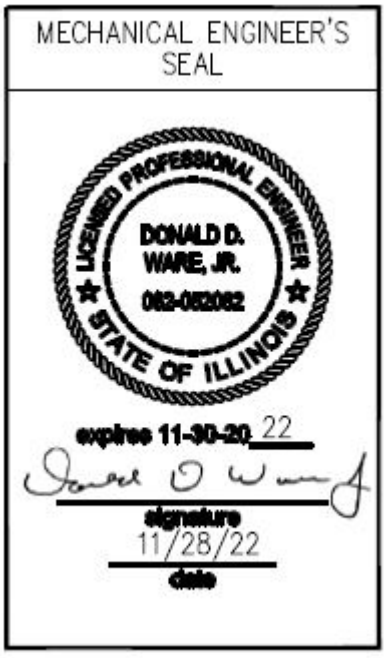
1.01 DESIGN PROFESSIONALS' SEALS

A. ARCHITECT

C. ELECTRICAL ENGINEER



ENGINEER



END OF DOCUMENT

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END OF SECTION

SECTION 00 01 15
DRAWING INDEX

1.01 GENERAL

G100 COVER SHEET

1.02 ARCHITECTURAL

A210 ALTERNATE #1 ARCHITECTURAL DEMOLITION PLAN
A310 ALTERNATE #1 OR #2 ARCHITECTURAL FLOOR PLAN

1.03 ARCHITECTURAL / MECHANICAL

AM220 ARCHITECTURAL AND MECHANICAL DEMOLITION ROOF PLAN

1.04 MECHANICAL

M310 MECHANICAL FIRST FLOOR PLAN
M320 MECHANICAL ROOF PLAN
M410TEMPERATURE CONTROLS
M420 MECHANICAL DETAILS

1.05 ELECTRICAL

E310 FIRST FLOOR PLAN ELECTRICAL PLAN
E600 ELECTRICAL ONE-LINE RISER DIAGRAMS

END OF DOCUMENT

SECTION 00 11 13
ADVERTISEMENT FOR BIDS

PROJECT: FAMILY REC CENTER POOL DECK & HVAC RENOVATIONS
1450 OAK FOREST GATE ROAD
OAK BROOK, ILLINOIS

OWNER: OAK BROOK PARK DISTRICT
1450 FOREST GATE ROAD
OAK BROOK, ILLINOIS 60523

ARCHITECT/ ENGINEER: KLUBER ARCHITECTS + ENGINEERS
41 WEST BENTON STREET
AURORA, ILLINOIS 60506

DESCRIPTION OF THE WORK:

The Owner will receive bids for the construction of replacement of the pool HVAC unit. The Work will include: demolition of the existing unit, roof top HVAC unit, temperature controls and associated electrical work, roofing work, roof curbs and rails.

BASIS OF BIDS:

Bids will be a single contract, stipulated sum.

TIME OF COMPLETION:

The Work will commence on August 30, 2023, and be performed such that the Project will be Substantially Complete as indicated in the September 18, 2023.

BID OPENING:

Sealed bids for all Contracts will be received by the Owner until 10:00 a.m. on December 14, 2022 in a sealed envelope addressed with the name of the Bidder, Owner, name and number of Contract, and the date and time of the Bid. Deliver to the Oak Brook Park District Family Recreation Center, 1450 Forest Gate Road, Oak Brook, IL 60523. Bids will be publicly opened and read aloud at that time.

EXAMINATION AND PROCUREMENT OF DOCUMENTS:

The Bidding Documents will consist of one full set of Drawings and one Project Manual.
The Bidding Documents may be downloaded in PDF format from the Owner's website: https://www.obparks.org/bids-rfps. The Bidding Documents are also available in printed format from the Administrative Office at the District's Family Recreation Center, 1450 Forsest Gate Road, Oak Brook, IL 60523, Monday - Friday, 9:00 am - 5:00 pm. Please note the printed drawings available at the Administrative Office will be on 11"x17" paper.

The Bidding Documents may be examined at the Architect's office:
Aurora, Illinois Office: 41 W. Benton, Aurora, IL 60506.

BID SECURITY:

All bid proposals must be accompanied by a bid bond or bank cashier's check payable to the Oak Brook Park District for Bid security in the amount of 10 percent (10%) of the amount of the bid as provided in the Instructions to Bidders. No proposals or bids will be considered unless accompanied by such bond or check.

PRE-BID MEETING:

A mandatory pre-bid meeting will be held at 1450 Forest Gate Road, Oak Brook, Illinois 60523 at 11:00 a.m.on December 6, 2022.

RIGHT TO REJECT BIDS:

The Owner reserves the right to accept or reject any and all bids, to accept only portions of a proposal and reject the remainder, and to waive any errors, omissions or irregularities in the bids when, in the opinion of the Owner, such action will serve its best interests. Any bid which is not accompanied by the required bid security or by any other documents or certifications required by the Bidding Documents, and any bid which is in any way incomplete or irregular, is subject to rejection at the sole discretion of the Owner.

GOVERNING LAWS AND REGULATIONS:

The Work of this Project is subject to the Illinois Prevailing Wage Act, 820 ILCS 130/0.01 et seq. A prevailing wage determination has been made by the Illinois Department o Labor for public works projects in DuPage County. Prevailing wage rates must be included in the Bid amount.

The Contractor selected will also be required to comply with all applicable federal, state and local laws, rules, regulations and executive orders including but not limited to those pertaining to equal employment opportunity.

END OF DOCUMENT

SECTION 00 43 23
BID FORM SUPPLEMENT - LIST OF ALTERNATES

1.01 PARTICULARS

A. The following is the list of Alternates referenced in the bid submitted by:
(Bidder) _____
Dated _____ and which is an integral part of the Bid Form.

1.02 ALTERNATES LIST

A. The following amounts shall be added to or deducted from the Bid Amount. Refer to Section 01 23 00 - Alternates: Schedule of Alternates.

1. Alternate #1: Pool Deck Flooring Replacement-Rubber Copolymer: (Add) $ _____

2. Alternate #2: Pool Deck Flooring Replacement-Copolymer Modified Cementitious Texture Finish (Add) $ _____

END OF DOCUMENT

SECTION 01 10 00
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: FAMILY REC. CENTER POOL DECK & HVAC RENOVATIONS.
B. Architect/Engineer's Name: Kluber Architects + Engineers.
C. The Project consists of the construction of HVAC roof top equipment, temperature controls and the associate electrical work, roof curbs and rails.

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 52 00 - Agreement Form.

1.03 DESCRIPTION OF ALTERATIONS WORK

A. Scope of demolition and removal work is indicated on drawings.
B. Scope of alterations work is indicated on drawings.
C. HVAC: Replace existing system with new construction, keeping existing in operation until ready for changeover.
D. Electrical Power and Lighting: Alter existing system and add new construction, keeping existing in operation.

1.04 OWNER OCCUPANCY

A. Owner intends to continue to occupy adjacent portions of the existing building during the entire construction period.
B. Owner intends to occupy the Project upon Substantial Completion.
C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
D. Schedule the Work to accommodate Owner occupancy.

1.05 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.
   1. Locate and conduct construction activities in ways that will limit disturbance to site.

B. Arrange use of site and premises to allow:
   1. Owner occupancy.

C. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.

D. Existing building spaces may not be used for storage.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 23 00
ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Description of Alternates.
B. Procedures for pricing Alternates.
C. Documentation of changes to Contract Sum and Contract Time.

1.02 ACCEPTANCE OF ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Owner shall have the right to accept Alternates in any order or combination, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.
Accepted Alternates will be identified in the Owner-Contractor Agreement.
B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.03 SCHEDULE OF ALTERNATES

A. Alternate No. 01 - Pool Deck Flooring Replacement - Rubber Copolymer:

State the amount to be added to or deducted from the Base Bid cost to demolish the existing ceramic tile and grout pool deck flooring and provide rubber copolymer flooring as specified.

B. Alternate No. 02 - Pool Deck Flooring Replacement - Copolymer Modified Cementitious Texture Finish:

State the amount to be added to or deducted from the Base Bid cost to demolish the existing ceramic tile and grout pool deck flooring and provide copolymer modified cementitious texture as specified.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.
B. Preconstruction meeting.
C. Progress meetings.
D. Construction progress schedule.
E. Submittals for review, information, and project closeout.
F. Number of copies of submittals.
G. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 60 00 - Product Requirements: General product requirements.
B. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.
C. Section 01 78 00 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
B. Make the following types of submittals to Architect/Engineer:
   1. Requests for Interpretation (RFI).
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Applications for payment and change order requests.
   5. Progress schedules.
   6. Correction Punch List and Final Correction Punch List for Substantial Completion.
   7. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

A. Architect/Engineer will schedule a meeting after Notice of Award.
B. Attendance required:
   1. Owner.
   2. Architect/Engineer.
   3. Contractor.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.

5. Designation of personnel representing the parties to Contract and Architect/Engineer.
6. Procedures and processing of field decisions, Submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
7. Scheduling.
8. Scheduling activities of a Geotechnical Engineer.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect/Engineer, Owner, participants, and those affected by decisions made.

3.02 PROGRESS MEETINGS

A. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
B. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect/Engineer.
   4. Special consultants.
   5. Contractor's superintendent.

C. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of Submittals schedule and status of Submittals.
   6. Maintenance of progress schedule.
   7. Corrective measures to regain projected schedules.
   8. Planned progress during succeeding work period.
   9. Maintenance of quality and work standards.
   10. Effect of proposed changes on progress schedule and coordination.
   11. Other business relating to work.

D. Record minutes and distribute copies within 2 days after meeting to participants, with copies to Architect/Engineer, Owner, participants, and those affected by decisions made.

3.03 CONSTRUCTION PROGRESS SCHEDULE

A. Within 7 days after date of the Agreement, submit preliminary schedule.
B. If preliminary schedule requires revision after review, submit revised schedule within 7 days.
C. Submit updated schedule with each Application for Payment.

3.04 REQUESTS FOR INFORMATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
      a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
      b. Do not forward requests which solely require internal coordination between subcontractors.
   2. Prepare in a format and with content acceptable to Owner.
      a. Use AIA G716 - Request for Information .
   3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
   1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
   2. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
      a. Approval of submittals (use procedures specified elsewhere in this section).
      b. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
      c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
      d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
   3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
   4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
      a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect/Engineer, and any of its consultants, due to processing of such RFIs.

E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
   1. Official Project name and number, and any additional required identifiers established in Contract Documents.
   2. Owner's, Architect/Engineer's, and Contractor's names.
   3. Discrete and consecutive RFI number, and descriptive subject/title.
   4. Issue date, and requested reply date.
   5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
   6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
   7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances,

and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
   1. Indicate current status of every RFI. Update log promptly and on a regular basis.
   2. Note dates of when each request is made, and when a response is received.
   3. Highlight items requiring priority or expedited response.
   4. Highlight items for which a timely response has not been received to date.
   5. Identify and include improper or frivolous RFIs.

H. Review Time: Architect/Engineer will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 3:00 PM will be considered as having been received on the following regular working day.
   1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
   1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
   2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
   3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
   4. Notify Architect/Engineer within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.05 SUBMITTAL SCHEDULE

A. Submit to Architect/Engineer for review a schedule for submittals in tabular format.
   1. Submit at the same time as the preliminary schedule.
   2. Coordinate with Contractor's construction schedule and schedule of values.
   3. Format schedule to allow tracking of status of submittals throughout duration of construction.
   4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
   5. Account for time required for preparation, review, manufacturing, fabrication, and delivery when establishing submittal delivery and review deadline dates.
      a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.06 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Architect/Engineer for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
C. Samples will be reviewed for aesthetic, color, or finish selection.
D. After review, provide copies and distribute in accordance with Submittal PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.07 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Manufacturer's instructions.
   4. Manufacturer's field reports.
   5. Other types indicated.

B. Submit for Architect/Engineer's knowledge as contract administrator or for Owner.

3.08 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.
B. Submit Final Correction Punch List for Substantial Completion.
C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

D. Submit for Owner's benefit during and after Project completion.

3.09 NUMBER OF COPIES OF SUBMITTALS

A. Documents for Review:
   1. Submit via email in Adobe PDF electronic file format at native sheet size and right-side up. Architect/Engineer will return via email a reviewed copy in Adobe PDF electronic file format. Files not properly sized and rotated will be rejected. Illegible files will be rejected.

B. Documents for Information: Submit via email in Adobe PDF electronic file format. Submitted documents are for Architect/Engineer's information and reference only, and will not be reviewed or returned.
C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect/Engineer.

1. Submit original, physical samples. With each physical sample, submit Adobe PDF electronic copies of scanned physical original samples. Architect/Engineer will return via email a reviewed scanned copy in Adobe PDF electronic file format.
2. Retained samples will not be returned to Contractor unless specifically so stated.

3.10 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a single transmittal for related items.
   2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
   3. Transmit using approved form.
   4. Number each submittal. Prefix the submittal number with the Specification Section number to which the submittal pertains. For revised submittals use original number and a sequential alphanumeric suffix. Items submitted without a Specification Section number, or with an incorrect Specification Section number will delay the review process.
   5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number, article, and paragraph, as appropriate on each copy.
   6. Correlate submitted items with specified products; clearly indicate the specified product that corresponds to each submitted item. Submitted items not clearly correlated with specified items will delay the review process.
   7. When options or optional features available for a Product are indicated in a Submittal, and selections for those options/features are indicated in the Contract Documents, identify on the Submittal the selection indicated in the Contract Documents. Submittals that fail to identify specified options or optional features may be returned marked "Rejected" or "Revise and Resubmit".
   8. Apply Contractor's stamp, signed or initialed certifying that review, approval, 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.
      a. Submittals from sources other than the Contractor, or without Contractor's transmittal will not be acknowledged, reviewed, or returned.
   9. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
      a. Deliver submittals to Architect/Engineer at business address.
   10. Schedule submittals to expedite the Project, and coordinate submission of related items.
      a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
      b. For sequential reviews involving Architect/Engineer's consultants, Owner, or another affected party, allow an additional 7 days.
   11. Clearly identify variations from the Contract Documents. Regardless of the type of variation, Contractor is solely responsible for errors in the field or performance issues that arise from Submittal variations from the requirements of the Contract Documents if those variations were not expressly noted to specifically identify for and describe to the reviewer the nature of the variation from the Contract Documents.
   12. Provide space for Contractor's review stamp and a 4 inch x 3 inch clear space for Architect/Engineer's review stamp.
   13. Promptly return submittals marked "Rejected" or "Revise and Resubmit" to originating subcontractor supplier, and faithfully ensure the prompt resubmittal of the correct or revised

information.

14. When revised for resubmission, identify all changes made since previous submission. Use clouds, highlights or other means acceptable to Architect/Engineer. Resubmittals that do not clearly identify all changes may be delayed and/or returned to the Contractor unreviewed.
15. Contractor is entitled to one (1) resubmittal of each Submittal For Review or Submittal For Project Closeout rejected by Architect/Engineer or returned by Architect/Engineer for further action. Thereafter, Contractor shall pay the cost of all further Architect/Engineer reviews of any Submittal For Review or Submittal for Project Closeout, at a rate of $200.00/hour. Cost of such further reviews will be deducted from the Contract Sum by Change Order.
16. Promptly distribute and coordinate the requirements of reviewed submittals with affected parties. Instruct parties to promptly report inability to comply with requirements.
17. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
18. Submittals not requested will be returned "Not Reviewed".

B. Product Data Procedures:
   1. Submit only information required by individual specification sections.
   2. Collect required information into a single submittal.
   3. Submit concurrently with related shop drawing submittal.
   4. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
   2. Use of reproductions of the Contract Documents in digital data form to create shop drawings is only permitted as defined above in Article 3.10.
   3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
   1. Transmit related items together as single package.
   2. When relevant, identify each item to allow review for applicability in relation to shop drawings showing installation locations.

E. Submittal reviews may be delayed and/or Submittals may be returned marked "Rejected" or "Revise and Resubmit" for any of the following reasons:
   1. Submittals submitted outside the scheduled dates of the Submittal Schedule.
   2. Submittals are incomplete or are missing information.
   3. Submittals are not submitted in accordance with procedures outlined in this Section, including, but not limited to:
      a. Specification Section number not indicated on submittal or transmittal.
      b. Contractor's review stamp missing.
      c. Submitted items not correlated with specified products.
      d. Re-submitted items not clearly identifying changes.

3.11 SUBMITTAL REVIEW

A. Submittals for Review: Architect/Engineer will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Architect/Engineer will not acknowledge receipt, and take no other action.
C. Architect/Engineer's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
    1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.

D. Architect/Engineer's and consultants' actions on items submitted for review:
    1. Authorizing purchasing, fabrication, delivery, and installation:
        a. "No Exception Taken", or language with same legal meaning.
            1) Resubmission is not required or requested.
            2) Resubmitted items will not be acknowledged.
        b. "Make Corrections Noted", or language with same legal meaning.
            1) Resubmission is not required or requested.
            2) Resubmitted items may be returned marked "Not Requested, Not Reviewed'.
    2. Not Authorizing fabrication, delivery, and installation:
        a. "Revise and Resubmit".
            1) Resubmit revised item, with review notations acknowledged and incorporated.
            2) Clearly identify all revisions.
            3) Non-responsive resubmittals may be rejected.
        b. "Rejected".
            1) Submit item complying with requirements of Contract Documents.
        c. "Submit Specified Item".
            1) Submit item complying with requirements of Contract Documents.

END OF SECTION

ELECTRONIC DATA TRANSFER CONSENT FORM

Project Name: FAMILY REC. CENTER POOL DECK & HVAC RENOVATIONS
1450 OAK FOREST GATE ROAD
OAK BROOK, ILLINOIS 60523

Project No.: 22-310-1444

Owner: Oak Brook Park District

Your Work: _____

KLUBER, INC. (hereinafter referred to as "Kluber") an Illinois corporation, is providing electronic data to you solely at your request and for your convenience. By accepting and opening any of the electronic data files, you agree that Kluber bears no liability for the data or its transmission to you and that you are solely liable for any and all claims referring or relating to any and all products you, or your Subcontractors, may generate with the data.

You acknowledge that you have a limited non-exclusive license to use the information solely in connection with your work on the project captioned above, and that Kluber retains all rights, including copyright, to the data.

Acknowledged by: _____ _____
(Printed Name) (Signature)

Company: _____

Date: _____ Email: _____

Architectural Floor Plans are transmitted for the contractors' use as backgrounds for shop drawings and as-built drawings, and, as such, contain graphic information for column grid, walls, floors, stairs, doors, windows, room numbers, ceiling grid, lights, diffusers and sprinkler heads where indicated on Bid Documents. Plans do not contain title blocks, keynotes, schedules, mechanical ductwork and equipment, electrical device symbols, circuit numbers and home runs, plumbing equipment, piping runs and riser diagrams, and architectural/engineering text and details. Plans depict entire floors and are not formatted, partial plans as depicted in the Bidding Documents. Files are provided in R2013 .DWG format.)

SECTION 01 41 00
REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General.
B. Definitions.
C. Quality Assurance.
D. Regulatory Requirements.

1.02 RELATED SECTIONS

A. Section 01 10 00 - Summary.
B. Section 01 42 00 - References.

1.03 GENERAL

A. Comply with all applicable laws, rules, regulations, codes and ordinances.
B. If the Contractor observes that the Contract Documents may be at variance with specified codes, notify the Architect/Engineer immediately. Architect/Engineer shall issue all changes in accordance with the General Conditions.
C. It shall not be the Contractor's primary responsibility to make certain that the Contract Documents are in accordance with all applicable laws, rules and regulations, however, when the Contractor performs work knowing or having reason to know that the work in question is contrary to applicable laws, rules, and regulations, and fails to notify the Architect/Engineer, the Contractor shall pay all costs arising therefrom.

1.04 DEFINITIONS

A. Definitions:
   1. Codes: Codes are statutory requirements, rules or regulations of governmental entities.
   2. Standards: Standards are requirements that have been established as accepted criteria, set general consent.

1.05 QUALITY ASSURANCE

A. The Architect/Engineer has designed the project to applicable code requirements and has copies of said codes available for the Contractor's inspection.
B. The Contractor shall:
   1. Ensure that copies of codes and standards referenced herein or specified in individual specifications sections are available to Contractor's personnel, agents, and Sub-Contractors.
   2. Ensure that Contractor's personnel, agents, and Sub-Contractors are familiar with the workmanship and requirements of applicable codes and standards.

1.06 REGULATORY REQUIREMENTS

A. Source and Requirements: Verify amendments with local code officials.
   1. Local code requirements:
      a. ICC International Building Code, 2015 Edition.
      b. ICC International Mechanical Code, 2015 Edition.
      c. ICC International Fire Code, 2015 Edition.

d. ICC International Property Maintenance Code, 2015 Edition.
e. National Electrical Code, 2014 Edition.

2. State code requirements:
   a. Capital Development Board (CDB):
      1) Illinois Accessibility Code, 2018 Edition.
      2) Illinois Energy Conservation Code (ICC International Energy Conservation Code, 2018 Edition, with State of Illinois modifications.
   b. Illinois Department of Labor (IDOL): Safety Glazing Materials Act - Illinois Revised Statutes, chap. 111 1/2, paragraph 3101, et seq.
   c. Illinois Department of Public Health (IDPH):
      1) Illinois Plumbing Code (Illinois Administrative Code, Title 77, Chapter I, Subchapter r, Part 890).
   d. Illinois Environmental Protection Agency (IEPA):
      1) Air-Pollution Standards.
      2) Noise Pollution Standards.
      3) Water Pollution Standards.
      4) Public Water Supplies
      5) Solid Waste Standards.
      6) Illinois Recommended Standards for Sewage Works (Illinois Administrative Code, Title 35, Subtitle C, Chapter II, Part 370).
   e. Office of the Illinois State Fire Marshal (OSFM):
      1) Boiler & Pressure Vessel Safety Code (Illinois Administrative Code, Title 44, Chapter I, Part 120).
      2) Illinois Elevator Safety Rules (Illinois Administrative Code, Title 41, Chapter II, Part 1000).
         a) ASME A17.1 - Safety Code For Elevators and Escalators, 2019 Edition.
      3) Illinois Rules & Regulations for Fire Prevention & Safety (as amended).
      4) Gasoline and Volatile Oils (Illinois Revised Statutes, chap. 17 1/2, paragraph 31, et seq.).
3. Information and Requirements for Utility Services: Local utility companies.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 42 00
REFERENCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drawing symbols, abbreviations and acronyms.
B. Definitions of terms used throughout the Contract Documents.
C. Explanation of specification format and content.
D. Requirements relating to referenced standards.
E. Applicability of referenced standards.
F. List of industry organizations and certain of their respective documents.

1.02 DRAWING SYMBOLS AND CONVENTIONS

A. Abbreviations and graphic symbols are defined on the General Notes, Symbols & Abbreviations sheet of the drawings.
B. Generally, symbols used on the mechanical and electrical drawings conform to those recommended by ASHRAE, though, where appropriate, these symbols are supplemented by more specific symbols as recommended by ASME, ASPE, or the IEEE.

1.03 DEFINITIONS

A. Where the terms "indicated", "noted", "scheduled", "shown", or "specified" are used it is to help locate the reference; no limitation on location is intended except as specifically noted.
B. Where the terms "directed", "requested", "authorized", "approved", are used as in "directed by the Architect/Engineer", no implied meaning shall be construed to extend the Architect/Engineer's responsibilities into the Contractor's purview of construction supervision.
C. Where the term "approved" is used in conjunction with the Architect/Engineer's action on submittals, requests or applications it is limited to the duties of the Architect/Engineer as described in the Agreement, and the General and Supplemental Conditions of the Contract. Such use of the term "approval" shall not limit or release the Contractor from his responsibility to fulfill Contract requirements.
D. Where the term "regulations" is used it means all applicable statutes, laws, ordinances, and orders issued by authorities having jurisdiction, as well as construction industry standards, rules, or conventions that address performance of the Work.
E. The "Project Site" is the space available to the Contractor for performance of construction activities. The Project Site may be for the exclusive use of the Contractor and his activities or may be used in conjunction with others performing other construction or related activities on the Project. Unless the extent of the Project Site is indicated on the Drawings, means the limits of the area within the property line of the parcel on which the Project is located, subject to the limitations and restrictions of local ordinance and the discretion of the Owner.
F. Where the term "furnish" is used it means supply, deliver to, and unload and store at the Project Site until the Work is ready for the item to be assembled and incorporated into the Work.
G. Where the term "install" is used it is meant to describe operations at the Project Site to include uncrating, assembling, placing, anchoring, connecting to utilities, finishing, protecting, cleaning and all other similar operations required to fully incorporate an item into the Work.
H. Where the term “provide” is used it means “furnish and install” as defined above.

I. Where the term "refurbish" is used it means refinish, repair and otherwise restore to like-new condition.
J. Where the terms "remove" or "demolish" are used they mean safely disconnect from existing utilities, permanently extract from the Work and the Project Site, and legally dispose of off-site.
K. Where the terms "temporarily remove" or "salvage" are used they mean safely disconnect from existing utilities and carefully extract from the Work so as to prevent damage to the item and the Work.
    1. If the item is to be reinstalled or relocated as part of the Work, these terms also mean clean, adjust, lubricate and otherwise restore to best possible condition without repair or refinishing.
    2. Otherwise, these terms also mean clean item surfaces and turn over to the Owner for storage and possible future use.
L. Where the term "reinstall" is used it means the same as "install", with respect to a temporarily removed, salvaged or relocated item.
M. Where the term "relocate" is used it means temporarily remove and reinstall in a new location.
N. Where the phrase "salvage in place" is used it means protect in place so as to prevent damage while adjacent elements are demolished, restore to best possible condition without repair or refinishing, and modify as necessary to properly incorporate and integrate with the Work.

1.04 SPECIFICATION FORMAT AND CONTENT

A. These Specifications are based on the Construction Specification Institute's 49 Division format and numbering system.
B. Language used in the Specifications and other Contract Documents is an abbreviated type. Implied words and meanings will appropriately interpreted.
C. Requirements expressed in imperative and streamlined language are to be performed by the Contractor. At certain locations in the text, subjective language may be used to describe responsibilities that must be fulfilled indirectly by the Contractor or others.
    1. Whenever a colon (:) is used within a sentence or phrase, it shall be construed to mean the words "shall be".
D. Use of certain terms such as "carpentry" is not intended to imply that certain activities must be performed by accredited or unionized individuals of a corresponding generic name. The Specifications do, however, require that certain construction activities shall be performed by specialists who are recognized experts in the operations to be performed. Specialists shall be used for said activities, however the final responsibility for fulfilling the requirements of the Contract remains the Contractor's.

1.05 QUALITY ASSURANCE

A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
B. Conform to reference standard of date of issue specified in this section, except where a specific date is established by applicable code.
C. Obtain copies of standards when required by the Contract Documents.
D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
E. Should specified reference standards conflict with Contract Documents, request clarification from the Architect/Engineer before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect/Engineer shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

1.06 APPLICABILITY OF INDUSTRY STANDARDS

A. Construction industry standards shall have the same force and effect as if bound or copied directly in the Contract Documents, except where more stringent requirements are specified. All such applicable standards are made a part of the Contract Documents by reference.
   1. Where compliance with two or more standards are referenced and conflicting requirements for quality or quantities occur, comply with the more stringent requirements. Refer questions regarding apparently conflicting standards to the Architect/Engineer for a decision before proceeding.
   2. The standard of quality or quantity levels specified, shown, or referenced shall be the minimum to be provided or performed. Refer questions regarding standards of minimum quality or quantity to the Architect/Engineer before proceeding.

1.07 CONSTRUCTION INDUSTRY ORGANIZATIONS AND DOCUMENTS

AA -- ALUMINUM ASSOCIATION, INC.
AABC -- ASSOCIATED AIR BALANCE COUNCIL
AAMA -- AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION
AASHTO -- AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AISC -- AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC.
ANSI -- AMERICAN NATIONAL STANDARDS INSTITUTE
ASHRAE -- AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.
ASME -- THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM -- AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWS -- AMERICAN WELDING SOCIETY
CPSC -- CONSUMER PRODUCTS SAFETY COMMISSION
CTI -- CERAMIC TILE INSTITUTE
FM -- FACTORY MUTUAL RESEARCH CORPORATION
ICC -- INTERNATIONAL CODE COUNCIL, INC.
IEEE -- INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
ISO -- INTERNATIONAL STANDARDS ORGANIZATION
NEBB -- NATIONAL ENVIRONMENTAL BALANCING BUREAU
NEMA -- NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFPA -- NATIONAL FIRE PROTECTION ASSOCIATION
NRCA -- NATIONAL ROOFING CONTRACTORS ASSOCIATION
SIGMA - SEALED INSULATING GLASS MANUFACTURERS ASSOCIATION (See IGMA)
SMACNA -- SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION, INC.
SSPC -- THE SOCIETY FOR PROTECTIVE COATINGS
TCA -- TILE COUNCIL OF AMERICA, INC.
UL -- UNDERWRITERS LABORATORIES INC.
WWPA -- WESTERN WOOD PRODUCTS ASSOCIATION

1.08 UNITED STATES GOVERNMENT AND RELATED AGENCIES/DOCUMENTS

CFR -- CODE OF FEDERAL REGULATIONS
CPSC -- CONSUMER PRODUCTS SAFETY COMMISSION
EPA -- ENVIRONMENTAL PROTECTION AGENCY
FS -- FEDERAL SPECIFICATIONS AND STANDARDS (General Services Administration)
GSA -- U.S. GENERAL SERVICES ADMINISTRATION
USGS -- UNITED STATES GEOLOGICAL SURVEY

1.09 STATE GOVERNMENT AND RELATED AGENCIES/DOCUMENTS

CDB -- ILLINOIS CAPITAL DEVELOPMENT BOARD
IDOL -- ILLINOIS DEPARTMENT OF LABOR
IDPH -- ILLINOIS DEPARTMENT OF PUBLIC HEALTH
IEPA -- ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
OSFM -- OFFICE OF THE ILLINOIS STATE FIRE MARSHAL

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary telecommunications services.
B. Temporary sanitary facilities.
C. Temporary controls: enclosures.
D. Security requirements.
E. Vehicular access and parking.
F. Waste removal facilities and services.

1.02 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
B. Telecommunications services shall include:
   1. One (1) mobile cellular telephone for each of Contractor's and any Subcontractor's field personnel.

1.03 TEMPORARY SANITARY FACILITIES

A. Use of existing facilities located at on the main level is permitted.
B. Maintain daily in clean and sanitary condition.
C. At end of construction, return facilities to same or better condition as originally found.

1.04 INTERIOR ENCLOSURES

A. Provide temporary partitions and ceilings as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.
B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:

1.05 SECURITY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
B. All on-site personnel of Contractor, Subcontractors and Suppliers must pass a background check, performed by the Owner or by an outside agency of the Owner's choosing.
   1. At least 7 days prior to a Contractor, Subcontractor or Supplier employee being present on the jobsite, provide Owner with employee's full name and date of birth, to allow the Owner to conduct a background check on the individual.

1.06 VEHICULAR ACCESS AND PARKING

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
B. Coordinate access and haul routes with governing authorities and Owner.
C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.
E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.07 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
B. Provide containers with lids. Remove trash from site periodically.
C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.
B. Transportation, handling, storage and protection.
C. Product option requirements.
D. Substitution limitations.
E. Procedures for Owner-supplied products.
F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Identification of Owner-supplied products.

1.03 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
    1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by Contract Documents.
B. Designed, manufactured, and tested in accordance with industry standards.

2.02 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, or an approved equal to or superior to substitution approved in accordance with the Instructions to Bidders.
C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for approval of an equal to or superior to substitution for any manufacturer not named in accordance with the Instructions to Bidders.

2.03 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
B. Deliver to Project site and place in location directed by Owner's representative; obtain Owner's signature on receipt for delivery prior to final payment. Submit signed receipts with Closeout Submittals.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

A. Substitutions Prior To Bid Opening: Architect/Engineer will consider a written request for an equal to or superior to substitution provided that such request is received at least seven (7) days prior to the Bid opening date. Requests received after that time will not be considered.
   1. Only Substitution Requests from Bidders will be considered.
   2. If a request is approved, the Architect/Engineer will issue and appropriate addendum to all Bidders of record not less than three (3) days prior to the Bid opening date.

B. Document each request utilizing Substitution Request Form following this section with complete data substantiating compliance of proposed substitution with Contract Documents. Incomplete requests will not be considered. Submit a separate Substitution Request Form and accompanying documentation for each proposed equal or superior to substitution.

C. Provide the following minimum documentation with each Substitution Request Form:
   1. Product identification, manufacturer, product data including dimensions and weight, performance and installation instructions.
   2. Side-by-side itemized comparison of proposed substitution with specified product.
   3. Coordination information including other modifications required as a result of proposed substitution.
   4. Cost information including the effect of the proposed substitution on the Contract Sum.

D. Sign and date the Substitution Request Form.

E. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.
   5. Agrees to reimburse Owner and Architect/Engineer for review or redesign services associated with re-approval by authorities having jurisdiction over the Project.

F. Architect/Engineer will notify submitter in writing of decision to accept or reject request.

G. Substitutions of products or product characteristics/components/options/accessories will not be considered when they are indicated or implied on Contractor's submittals, without separate written request, or when acceptance will require revision to the Contract Documents, whether rejection of said substitutions is expressly identified by Architect/Engineer on Contractor's submittals or not.

3.02 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

A. Store and protect products in accordance with manufacturers' instructions.
B. Store with seals and labels intact and legible.
C. Arrange storage of materials and products to allow for visual inspection for the purpose of determination of quantities, amounts, and unit counts.
D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
E. For exterior storage of fabricated products, place on sloped supports above ground.
F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
G. Comply with manufacturer's warranty conditions, if any.
H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
I. Prevent contact with material that may cause corrosion, discoloration, or staining.
J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

Kluber
Architects + Engineers

www.kluberinc.com

SUBSTITUTION REQUEST FORM

PROJECT: Oak Brook Park District – FAMILY REC. CENTER POOL DECK & HVAC RENOVATIONS

SPECIFIED ITEM: _____

Specification Section	Page	Paragraph	Description

The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: _____

Attached data includes project description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents which the proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing, and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

_____
Printed Name

_____
Signature Date

_____
Firm

_____
Telephone

_____
Email

Attachments (list):

For Use By The Architect/Engineer:

☐ Accepted ☐ Accepted As Noted

☐ Not Accepted ☐ Received Too Late

By: _____

Date: _____

Remarks:

Bloomington Office
2401 East Washington Street
Bloomington, Illinois 61704
309.430.6460

Chicago Office
222 South Riverside Street Plaza
Chicago, Illinois 60606
312.667.5670

Aurora Office
41 West Benton Street
Aurora, Illinois 60506
630.406.1213

SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.
B. Pre-installation meetings.
C. Cutting and patching.
D. Cleaning and protection.
E. Starting of systems and equipment.
F. Demonstration and instruction of Owner personnel.
G. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
H. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Section 01 50 00 - Temporary Facilities and Controls: Temporary exterior enclosures.
B. Section 01 7700 - Closeout Procedures: Additional requirements for Project Closeout.
C. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Cutting and Patching: Submit written request in advance of cutting or alteration that 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.

1.04 PROJECT CONDITIONS

A. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
   1. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
B. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
C. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
D. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
E. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.05 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
B. Notify affected utility companies and comply with their requirements.
C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
F. Coordinate completion and clean-up of work of separate sections.
G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
C. Examine and verify specific conditions described in individual specification sections.
D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.
B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.04 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.
B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-complying work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
F. Restore work with new products in accordance with requirements of Contract Documents.
G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
H. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.05 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.06 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.
B. Provide special protection where specified in individual specification sections.
C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.07 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.
B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
D. Verify that wiring and support components for equipment are complete and tested.
E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.08 DEMONSTRATION AND INSTRUCTION

A. See Section 01 79 00 - Demonstration and Training.
B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.

3.09 ADJUSTING

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

3.10 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.
   1. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.
B. Use cleaning materials that are nonhazardous.

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
E. Clean filters of operating equipment.
F. Clean debris from roofs, gutters, downspouts, scuppers, and overflow drains.
G. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.11 CLOSEOUT PROCEDURES

A. See Section 01 77 00 for additional requirements.
B. Make submittals that are required by governing or other authorities.
C. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.
D. Notify Architect/Engineer when work is considered ready for Architect/Engineer's Substantial Completion inspection.
E. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect/Engineer's Substantial Completion inspection.
F. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect/Engineer's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect/Engineer.
G. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
H. Notify Architect/Engineer when work is considered finally complete and ready for Architect/Engineer's Substantial Completion final inspection.
I. Complete items of work determined by Architect/Engineer listed in executed Certificate of Substantial Completion.

3.12 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.
B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Substantial Completion Procedures.
B. Final Completion Procedures.

1.02 RELATED REQUIREMENTS:

A. Section 01 10 00 - Summary.
B. Section 01 78 00 - Closeout Submittals.

1.03 SUBSTANTIAL COMPLETION PROCEDURES

A. Pre-Substantial Completion Conference:
   1. Schedule a Pre-substantial Completion Conference 15 days prior to the date of Substantial Completion. Prepare an agenda with copies for the participants and preside over the meeting.
   2. Attendance Required: Contractor, Architect/Engineer and Owner.
   3. Minimum Agenda:
      a. Schedule dates of Substantial Completion and Owner occupancy.
      b. Schedule dates for Initial Punch Lists of respective Subcontractors to be produced.
      c. Schedule date for written request for Substantial Completion.
      d. Schedule target date for completion of Initial Punch List items.
      e. Schedule delivery times for Owner-furnished items to be installed by Contractor, Owner's own forces or others under separate Contracts.
      f. Schedule dates for Demonstration and Training of equipment and systems specified.
      g. Schedule completion dates of testing and balancing reports for engineered Systems.
      h. Scheduling and Sequencing of Construction operations around areas partially occupied.
      i. Review job site security during transition of Owner occupancy.
      j. Schedule dates for final inspections from authorities having jurisdiction for Occupancy Permits.
      k. Review protocol for claims from potential move-in damage.
      l. Review procedures for final cleaning.
      m. Review potential concerns regarding environmental conditions.
   4. Record minutes and distribute copies within three days after meeting to participants and those affected by decisions made.

B. Substantial Completion Procedures will be in accordance with the General Provisions of the Agreement between Owner and Contractor, Article 15.6 and include the following:
   1. When the Work or a portion of the Work is considered to be substantially complete, the Contractor inspects the project and prepares a comprehensive list of outstanding items to be completed or corrected, Initial Punch List.
   2. Contractor submits notice of Substantial Completion.
   3. Contractor completes items on the Initial Punch List.
   4. Architect/Engineer inspects the project to verify substantial completion and prepares a Final Punch List.
   5. Architect/Engineer prepares Certificate of Substantial Completion, acceptance is required by Owner and Contractor.

1.04 FINAL COMPLETION PROCEDURES

A. Final Completion Procedures will be in accordance with the General Provisions of the Agreement between Owner and Contractor, Article 15.7, and include the following:
   1. When items on Initial and Final Punch Lists are complete, submit notice of final completion and final application for payment.
   2. Submit Final Closeout Submittals as specified in Section 01 78 00.
   3. Architect will inspect project and verifies the Work is acceptable and conforms with the Contract Documents.
   4. Architect will process final application for payment and closeout submittals.

1.05 CORRECTION PERIOD

A. Correction Period commences on the date of Substantial Completion and expires two years from that date.
B. Owner: document non-conforming or defective work over course of Correction Period. Notify Contractor in writing of nonconforming or defective work. Copy Architect/Engineer.
   1. Life safety issues requiring immediate corrective work: Contact Contractor for action.

PART 2 PRODUCTS - NOT USED.

PART 3 EXECUTION - NOT USED.

END OF SECTION

SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Warranties and bonds.
B. Project record documents.
C. Operation and maintenance data.
D. Format, arrangement and organization of Operation and Maintenance Manual electronic file.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
B. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.
C. Individual Product Sections: Specific requirements for operation and maintenance data.
D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Submit preliminary draft of proposed formats and outlines of contents of electronic Operation and Maintenance Manual, including warranties and bonds, record documents Bookmarked Adobe PDF form before start of Work. Architect/Engineer will review draft and return with comments.
B. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.
C. Project Record Documents: Submit documents to Architect/Engineer with claim for final Application for Payment.
D. Operation and Maintenance Data:
   1. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   2. Submit completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect/Engineer comments. Revise content as required prior to final submission.
E. Submit revised final Operation and Maintenance Manual, incorporating warranties and bonds, record documents and operation and maintenance data, in final form in Adobe PDF electronic file format on USB flash drive form within 10 days after final inspection.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
B. Verify that documents are in proper form, contain full information, and are notarized.
C. Co-execute submittals when required.
D. Retain warranties and bonds until time specified for submittal.
E. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.
F. Include color, 300 dpi resolution scans of each in Operation and Maintenance Manual PDF file, Bookmarked and indexed separately in Table of Contents.

3.02 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.

B. Ensure entries are complete and accurate, enabling future reference by Owner.
C. Store record documents separate from documents used for construction.
D. Record information concurrent with construction progress.
E. 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.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish first floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract drawings.

3.03 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.04 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
   1. Product data, with catalog number, size, composition, and color and texture designations.
   2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
D. Additional information as specified in individual product specification sections.
E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.05 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
D. Include color coded wiring diagrams as installed.
E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
G. Provide servicing and lubrication schedule, and list of lubricants required.
H. Include manufacturer's printed operation and maintenance instructions.
I. Include sequence of operation by controls manufacturer.
J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

K. Provide control diagrams by controls manufacturer as installed.
L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
M. Provide a list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
N. Include test and balancing reports.
O. Additional Requirements: As specified in individual product specification sections.

3.06 ASSEMBLY OF OPERATION AND MAINTENANCE MANUAL

A. Assemble operation and maintenance data into a single electronic "manual" file in Adobe PDF file format for Owner's personnel use, with data arranged in the same sequence as, and bookmarked by, the specification sections.
   1. Media: USB flash drive of capacity sufficient to store entire PDF file, fragmented.
   2. Attach a tag or label flash drive with Project name, date, and the title "O&M Manual".

B. Organization and Arrangement of Contents: Arrange the contents of the "manual" file in using the following hierarchical system and create a corresponding hierarchy of Bookmarks in the file:
   1. Project Title Page.
   2. Project Directory.
   3. Table of Contents:
   4. Project Warranties.
      a. Division 01 - General
         1) General Contractor's Warranty.
         2) Record Drawings (marked-up version of A/E Drawings).
         3) Record Specifications (marked up version of A/E Specifications).
      b. Division 02
         1) [One Bookmark for each Specification section number and name where a warranty is required.]
         2) [Continue for each applicable Specification section.]
      c. [Continue for each applicable Division.]
   5. Record Documents.
      a. Record Drawings (marked-up version of A/E Drawings).
      b. Record Specifications (marked up version of A/E Specifications).
      c. [Continue for each Division.]
   6. Operation and Maintenance Data.
      a. Division 06
         1) [One Bookmark for each Specification section number and name where a O&M data is required.]
         2) [Continue for each applicable Specification section.]
      b. [Continue for each applicable Division.]

C. Where systems involve more than one Specification Section, provide separate Bookmark and content for each Specification Section.
D. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
E. Prepare data in the form of an instructional manual.
F. Cover Page: Populate the first page of the PDF file with: printed title "OPERATION AND MAINTENANCE MANUAL; identify title of Project; identify subject matter of contents.

G. Project Directory: Beginning on the second page of the PDF file; provide Title and address of Project; business names, addresses, and telephone numbers of Architect/Engineer, Consultants, Contractor subcontractors and major suppliers, with contact names of responsible individuals knowledgeable about the Project.
H. Table of Contents: List every item using the same identification as in the title of the Bookmark, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item
I. Bookmarks: Hierarchically under each Specification Section, further Bookmark each separate product and system; identify the contents in the title of the Bookmark; on the Bookmarked page provide a description of product and major component parts of equipment.
J. Content: Manufacturer's printed data, legibly scanned, in color where applicable, at 300 dpi (minimum) resolution.
K. Drawings: Legibly scanned, in color where applicable, at 300 dpi (minimum) resolution; PDF file page size to match native sheet size of original drawing.

3.07 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
B. Verify that documents are in proper form, contain full information, and are notarized.
C. Co-execute submittals when required.
D. Retain warranties and bonds until time specified for submittal.
E. Include color, 300 dpi resolution scans of each in Operation and Maintenance Manual PDF file, Bookmarked and indexed separately in Table of Contents.

END OF SECTION

SECTION 01 79 00
DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

A. Demonstration of products and systems where indicated in specific specification sections.
B. Training of Owner personnel in operation and maintenance is required for:
   1. All software-operated systems.
   2. HVAC systems and equipment.
   3. Electrical systems and equipment.
   4. Items specified in individual product Sections.

1.02 RELATED REQUIREMENTS

A. Section 01 91 13 - General Commissioning Requirements: Additional requirements applicable to demonstration and training.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Training Plan: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
   1. Submit to Architect/Engineer for transmittal to Owner.
   2. Submit not less than four weeks prior to start of training.
   3. Revise and resubmit until acceptable.
   4. Provide an overall schedule showing all training sessions.
   5. Include at least the following for each training session:
      a. Identification, date, time, and duration.
      b. Description of products and/or systems to be covered.
      c. Name of firm and person conducting training; include qualifications.
      d. Intended audience, such as job description.
      e. Objectives of training and suggested methods of ensuring adequate training.
      f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
      g. Media to be used, such a slides, hand-outs, etc.
      h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.

C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
   1. Include applicable portion of O&M manuals.
   2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
   3. Provide one extra copy of each training manual to be included with operation and maintenance data.

D. Training Reports:
   1. Identification of each training session, date, time, and duration.
   2. Sign-in sheet showing names and job titles of attendees.

3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.

E. Video Recordings: Submit digital video recording of each demonstration and training session for Owner's subsequent use.
   1. Format: DVD Disc.
   2. Label each disc and container with session identification and date.

1.04 QUALITY ASSURANCE

A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
   1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
   2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL

A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.
B. Demonstration may be combined with Owner personnel training if applicable.
C. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.
   2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL

A. Conduct training on-site unless otherwise indicated.
B. Owner will provide classroom and seating at no cost to Contractor.
C. Provide training in minimum two hour segments.
D. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.
E. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
   1. The location of the O&M manuals and procedures for use and preservation; backup copies.
   2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
   3. Typical uses of the O&M manuals.

F. Product- and System-Specific Training:
   1. Review the applicable O&M manuals.
   2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
   3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
   4. Provide hands-on training on all operational modes possible and preventive maintenance.
   5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
   6. Discuss common troubleshooting problems and solutions.
   7. Discuss any peculiarities of equipment installation or operation.
   8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
   9. Review recommended tools and spare parts inventory suggestions of manufacturers.
   10. Review spare parts and tools required to be furnished by Contractor.
   11. Review spare parts suppliers and sources and procurement procedures.

G. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.
B. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.
C. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of benchmarks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

1.03 DEFINITIONS

A. Demolition: Dismantle, raze, destroy or wreck any building or structure or any part thereof.
B. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.
C. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.04 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction Current Edition.
B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2022, with Errata (2021).

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with requirements in Section 01 70 00.
B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   4. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
   5. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
C. Do not begin removal until receipt of notification to proceed from Owner.
D. Protect existing structures and other elements to remain in place and not removed.

E. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
F. Perform demolition in a manner that maximizes salvage and recycling of materials.

3.02 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
   1. Verify construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect/Engineer before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from areas that remain occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction indicated on drawings .

C. Maintain weatherproof exterior building enclosure, except for interruptions required for replacement or modifications; prevent water and humidity damage.
D. Remove existing work as indicated and required to accomplish new work.
   1. Remove items indicated on drawings.

E. Services including, but not limited to, HVAC and Electrical: Remove existing systems and equipment as indicated.
   1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.

F. Protect existing work to remain.
   1. Prevent movement of structure. Provide shoring and bracing as required.
   2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch to match new work.

3.03 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.
B. Leave site in clean condition, ready for subsequent work.
C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 01 30
COPOLYMER MODIFIED CEMENTITIOUS TEXTURE FINISH

ALTERNATE #2

PART 1 GENERAL

2.01 SECTION INCLUDES

A. Copolymer modified cementitious texture finish system.

2.02 RELATED REQUIREMENTS

A. Section 09 05 61: Common Work Results of Floor Preparation.

2.03 PRICE AND PAYMENT PROCEDURES

A. Alternates:
   1. See Section 01 23 00 - Alternates for product alternates affecting this section.

2.04 REFERENCE STANDARDS

A. ANSI A118.4 - Specifications for Latex Portland Cement Mortar.
B. ASTM D1242 - Standard Test Methods for Abrasion Resistance.
C. ASTM D570 - Standard Test methods for Water Absorption.
D. ASTM D-2047-11 Standard Specifications for Coefficient of Friction.
E. ANSI A 326.3 Dynamic Coefficient of Friction.
F. ASTM D229 - Standard Test Methods for Chemical Resistance by 12 Reagents.
G. ICRI 310.2R-2013 Selecting and specifying concrete surface preparation for sealers, coatings, polymer overlays, and concrete repair.

2.05 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used.
B. Shop Drawings: Indicate Depth Measurements and "No Diving" locations, details at drains and transitions.
C. Samples: Two samples, 12 by 12 inches in size, indicating color, texture, and patterns.
D. Manufacturer's Qualification Statement.
E. Installer's Qualification Statement.
F. Manufacturer's Instructions: Indicate installation instructions.
G. Project Record Documents: Record actual locations of depth markings and control joints.

2.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least five years of documented experience.

2.07 MOCK-UPS

A. Locate where directed.
B. Mock-up may remain as part of work.

2.08 DELIVERY, STORAGE, AND HANDLING

A. Properly label and identify all containers as Manufacturer's product.
B. Deliver and store to project site in location and manner to prevent damage to product and containers.
C. Store all material in a clean, dry location where temperatures are maintained between 40 and 90 degrees Fahrenheit.
D. Comply with manufacturer's Safety Data Sheets (SDS) for delivery, storage and handling of products.

2.09 FIELD CONDITIONS

A. Maintain environmental condtitions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

2.10 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
B. Installer Warranty: Provide 1-year warranty for workmanship and defects. Complete forms in Owner's name and register with installer.

PART 2 PRODUCTS

3.01 MANUFACTURERS

A. Sundeck Products USA, Inc; www.sundek.com.
B. Substitutions: See Section 01 60 00 - Product Requirements.

3.02 SYSTEMS

A. General:
    1. All material components must be from a single source manufacturer.

B. Description:
    1. SD-1: Sundek: Classic Texture.
        a. Coefficient of Friction: when wet 0.92

PART 3 EXECUTION

4.01 PREPARATION

A. Clean concrete surface with high-pressure power washer.
B. Remove dirt, grease, oil curing compounds or other foreign substances, which may prevent proper bonding. Any demolition of existing coatings may require mechanical removal to insure surface bonding.
C. Provide protective masking at all adjacent areas not to be coated.
D. Repair cracks, surface damage and any corrective measures on concrete.

4.02 INSTALLATION

A. Install in accordance with manufacturer's written instructions.

4.03 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
B. Clean after installation in accordance with the manufacturer's recommendation.

4.04 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals for additional submittals.

END OF SECTION

SECTION 09 05 61
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
   1. Resilient tile and sheet.
   2. Broadloom carpet.
   3. Carpet tile.
   4. Thin-set ceramic tile and stone tile.

B. Removal of existing floor coverings.
C. Preparation of new and existing concrete floor slabs for installation of floor coverings.
D. Testing of concrete floor slabs for moisture and alkalinity (pH).
E. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
   1. Contractor shall perform all specified testing and remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

1.02 RELATED REQUIREMENTS

A. Section 01 21 00 - Allowances: Floor Moisture Mitigation Allowance.

1.03 PRICE AND PAYMENT PROCEDURES

A. Include in the Base Bid and list as a separate line item in the Contractor's Schedule of Values the cost of moisture and alkalinity testing of concrete slabs as specified in this Section.

1.04 REFERENCE STANDARDS

A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2021.
B. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride 2022.
C. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes 2019a.
D. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings 2011.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.06 SUBMITTALS

A. Visual Observation Report: For existing floor coverings to be removed.
B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and alkalinity (pH) limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

C. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
   1. Manufacturer's qualification statement.
   2. Manufacturer's statement of compatibility with types of flooring applied over remedial product.
   3. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
   4. Manufacturer's installation instructions.
   5. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.

D. Testing Agency's Qualifications.
E. Testing Agency's Report:
   1. Description of areas tested; include floor plans and photographs if helpful.
   2. Summary of conditions encountered.
   3. Moisture and alkalinity (pH) test reports.
   4. Copies of specified test methods.
   5. Recommendations for remediation of unsatisfactory surfaces.
   6. Product data for recommended remedial coating.
   7. Include certification of accuracy by authorized official of testing agency.
   8. Submit report to Architect/Engineer.
   9. Submit report not more than two business days after conclusion of testing.

F. Adhesive Bond and Compatibility Test Report.
G. Copy of RFCI (RWP).

1.07 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.
B. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.
C. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
   1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.

D. Contractor's Responsibility Relating to Independent Agency Testing:
   1. Procure the testing agency and submit testing agency's qualifications for Owner and Architect/Engineer approval.
   2. Provide access for and cooperate with testing agency.
   3. Confirm date of start of testing at least 10 days prior to actual start.
   4. Allow at least 4 business days on site for testing agency activities.
   5. Achieve and maintain specified ambient conditions.
   6. Notify Owner and Architect/Engineer when specified ambient conditions have been achieved and when testing will start.

E. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission

coatings.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.
B. Deliver materials in manufacturer's packaging; include installation instructions.
C. Keep materials from freezing.

1.09 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.
B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Follow recommendations of testing agency.
B. Perform following operations in the order indicated:
    1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
        a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
        b. Removal of existing floor covering.
    2. Existing concrete slabs with coatings or penetrating sealers/hardeners/dustproofers:
        a. Do not attempt to remove coating or penetrating material.
        b. Do not abrade surface.
    3. Preliminary cleaning.
    4. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
    5. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
    6. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
    7. Specified remediation, if required.
    8. Patching, smoothing, and leveling, as required.
    9. Other preparation specified.
    10. Adhesive bond and compatibility test.
    11. Protection.

C. Remediations:
    1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
    2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.

3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.
B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.
B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
C. Test in accordance with ASTM F1869 and as follows.
D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.
E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.
F. Report: Report the information required by the test method.

3.05 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
C. Test in accordance with ASTM F2170 Procedure A and as follows.
D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.
E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.
F. Report: Report the information required by the test method.

3.06 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.
   1. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.
   2. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.
   3. Use of a digital pH meter with probe is acceptable; follow meter manufacturer's instructions.
C. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.07 PREPARATION

A. See individual floor covering section(s) for additional requirements.
B. Comply with recommendations of testing agency.
C. Comply with requirements and recommendations of floor covering manufacturer.
D. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
E. Do not fill expansion joints, isolation joints, or other moving joints.

3.08 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.09 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION

SECTION 09 61 13
RUBBER COPOLYMER TILE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Ethylene and vinyl acetate (EVA) rubber copolymer tile wet area surfacing system.

1.02 RELATED REQUIREMENTS

A. Section 09 05 61 - Common Work Results for Floor Preparation.

1.03 PRICE AND PAYMENT PROCEDURES

A. Alternates:
   1. See Section 01 23 00 - Alternates for product alternates affecting this section.

1.04 REFERENCE STANDARDS

A. ASTM C1028 - Standard Test Method for Determining Static Coefficient of Friction of Ceramic Tile or other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method. 2007
B. ASTM E648 - "Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant heat Energy Source. 2003
C. ASTM E303 - Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester. 2008

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
B. Product Data: Life Floor.
C. Shop Drawings: Indicate pattern, depth measurements, and details..
D. Samples: Two pattern and field, 24 by 24 inches in size, indicating Pattern and color ranges.
E. Manufacturer's Qualification Statement.
F. Manufacturer's Instructions: Indicate installation requirements and procedures.
G. Project Record Documents: Record actual locations of depth measurements.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.
B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver Product to project site in manufacturer's original, unopened, undamaged containers with identification labels intact.
B. Store and Protect from exposure to harmful environmental conditions and at a minimum temperature of 20 degrees f and a maximum temperature of 100 degrees F.

1.08 FIELD CONDITIONS

A. Ambient Conditions: Do not install product when below 40 degrees F or above 90 degrees F.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
B. Manufacturer Warranty: Provide 3-years manufacturer warranty for 3/16" floor tile. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Life Floor: lifefloor.com.
B. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 SYSTEMS

A. Description:
   1. FL-1: EVA-rubber Copolymer Wet Area Surfacing System.
   2. Coefficient of Friction: when wet 0.92
   3. Material: Factory- molded surface composed of an ethyl vinyl acetate copolymer.
   4. Thickness: 3/16 inches.
   5. Size: 24 inches square.
   6. Color: to be selected from the manufacturer's full range of colors.
      a. Contrasting color for depth measurement signage.
      b. Red for "No Diving".
   7. Pattern: Ripple.
   8. Color Pattern: 402: Color Triangle Pattern
   9. Adhesive: Water proof commercial contact cement

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify that there are no substantial cracking in the existing concrete. Review with A/E and Pool Consultant .
B. Do not proceed with installation until unsuitable conditions are corrected.
C. Surface Preparation: Endure that the concrete is level or uniformly sloped.
   1. The substrate must be dry and free of any substance or condition that may reduce or prevent the adhesive bond to substrate. This includes, but is not limited to, concrete sealers, dirt, wax, tar, paint, and loose toppings. If the surface contains these substances they must be mechanically removed. The use of solvents, with the exceptions of acetone, adhesive remover or acid etching is not permitted.
   2. Maintain existing slopes to deck drains.

3.02 INSTALLATION

A. Install in accordance with manufacturer's written instructions.

3.03 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
B. Clean floor surface before handing over to Owner.

3.04 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals for additional submittals.

END OF SECTION

SECTION 23 05 33
HEAT TRACING FOR HVAC PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Self-regulating parallel resistance electric heating cable.

1.02 RELATED REQUIREMENTS

A. Section 23 05 53 - Identification for HVAC Piping and Equipment.
B. Section 23 07 19 - HVAC Piping Insulation.
C. Section 23 21 13 - Hydronic Piping.
D. Section 26 05 83 - Wiring Connections.

1.03 REFERENCE STANDARDS

A. IEEE 515.1 - IEEE Approved Draft Standard for the Testing, Design, Installation, and Maintenance of Electrical Resistance Trace Heating for Commercial Applications 2022.
B. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data for electric heat tracing.
C. Manufacturer's Installation Instructions: Indicate installation instructions and recommendations.
D. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions of equipment and controls, maintenance and repair data, and parts listings.
E. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with at least three years of documented experience.
B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

PART 2 PRODUCTS

2.01 SELF-REGULATING PARALLEL RESISTANCE ELECTRIC HEATING CABLE

A. Manufacturers:
   1. Chromalox, Inc.
   2. Pentair; 5XL Trace System.
   3. Thermon Manufacturing Company.

B. Provide products listed, classified, and labeled by UL (DIR), ITS (DIR), or testing firm acceptable to authorities having jurisdiction (AHJ).
C. Factory Rating and Testing: Comply with IEEE 515.1.
D. Heating Element:

1. Provide pair of parallel No. 16 tinned or nickel coated stranded copper bus wires embedded in cross linked conductive polymer core with varying heat output in response to temperature along its length.
2. Terminations: Waterproof, factory assembled, non-heating leads with connector at one end and water-tight seal at opposite end.
3. Capable of crossing over itself without overheating.

E. Insulated Jacket: Flame retardant polyolefin.
F. Cable Cover: Provide tinned copper and polyolefin outer jacket with UV inhibitor.
G. Maximum Power-On Operating Temperature: 150 degrees F.
H. Maximum Power-Off Exposure Temperature: 185 degrees F.
I. Electrical Characteristics:
   1. 5 W/lineal ft.
   2. 120 volts, single phase, 60 Hz.

2.02 OUTER JACKET MARKINGS

A. Name of manufacturer, trademark, or other recognized symbol of identification.
B. Catalog number, reference number, or model.
C. Month and year of manufacture, date coding, applicable serial number, or equivalent.
D. Agency listing or approval.

2.03 ACCESSORIES

A. Provide Accessories As Indicated or As Required for Complete Installation, Including but Not Limited To:
   1. Aluminum self-adhesive tape for attachment of heating cable to plastic piping.
   2. Cable ties.
   3. Warning labels for attachment to exterior of piping insulation. Refer to Section 23 05 53.

2.04 CONTROLS

A. Fixed temperature point of 40 degrees F with the sensing thermostat.
   1. Enclosure; Type 4X, UV-resistant thermoplastic.
   2. Sensor exposure limits; -30 degrees F to 140 degrees F.
   3. Switch; SPST.
   4. Manufacturer; Pentair Model AMC-F5

B. Pipe Mounted Thermostats:
   1. Remote bulb on capillary, resistance temperature device (RTD) or thermistor for direct sensing of pipe wall temperature.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that piping and equipment are ready to receive work.
B. Verify field measurements are as indicated on shop drawings.
C. Verify required power is available, in proper location, and ready for use.

3.02 PREPARATION

A. Clean all surfaces prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer.

3.03 INSTALLATION

A. Install in accordance with manufacturer's recommendations.
B. Comply with installation requirements of IEEE 515.1 and NFPA 70, Article 427.
C. Apply heating cable linearly on pipe with fiberglass tape only after piping has successfully completed any required pressure testing.
D. Comply with all national and local code requirements.
E. Identification:
   1. After thermal insulation installation, apply external pipeline decals to indicate presence of the thermal insulation cladding at intervals not to exceed 20 ft including cladding over each valve or other equipment that may require maintenance.

3.04 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 23 07 19
HVAC PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Piping insulation.
B. Jacketing and accessories.

1.02 REFERENCE STANDARDS

A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus 2019.
B. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus 2021.
C. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation 2022a.
D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2022.
E. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2022.
F. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials Current Edition, Including All Revisions.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.
B. Applicator Qualifications: Company specializing in performing the type of work specified in this section with minimum three years of experience.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.05 FIELD CONDITIONS

A. Maintain ambient conditions required by manufacturers of each product.
B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, UL 723, ASTM E84, or UL 723.
B. Insulation minimum thickness shall meet or exceed requirements as listed in International Energy Conservation Code, 2018.

2.02 GLASS FIBER

A. Manufacturers:
   1. CertainTeed Corporation.
   2. Johns Manville Corporation.
   3. Knauf Insulation.
   4. Owens Corning Corporation.

B. Insulation: ASTM C547; rigid molded, noncombustible.
   1. 'K' Value: ASTM C177, 0.23 at 75 degrees F.
   2. Maximum Service Temperature: 850 degrees F.
   3. Maximum Moisture Absorption: 0.2 percent by volume.

C. Vapor Barrier Jacket: White kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches.
D. Vapor Barrier Lap Adhesive: Compatible with insulation.

2.03 JACKETING AND ACCESSORIES

A. PVC Plastic.
   1. Manufacturers:
      a. Johns Manville Corporation.
      b. Proto Corporation.
      c. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Jacket: One piece molded type fitting covers and sheet material, color as scheduled.
      a. Minimum Service Temperature: 0 degrees F.
      b. Maximum Service Temperature: 150 degrees F.
      c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
      d. Thickness: 10 mil, 0.010 inch.
      e. Connections: Brush on welding adhesive.
   3. Covering Adhesive Mastic: Compatible with insulation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Test piping for design pressure, liquid tightness, and continuity prior to applying insulation materials.
B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Install in accordance with NAIMA National Insulation Standards.
C. Exposed Piping: Locate insulation and cover seams in least visible locations.
D. Glass Fiber Insulated Pipes Conveying Fluids Below Ambient Temperature:
   1. Provide vapor barrier jackets, factory-applied or field-applied; secure with self-sealing longitudinal laps and butt strips with pressure-sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
   2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.

E. Inserts and Shields:
   1. Application: Piping 1-1/2 inches diameter or larger.
   2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
   3. Insert location: Between support shield and piping and under the finish jacket.
   4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.

5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.

F. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions.

3.03 SCHEDULE

A. Cooling Systems:
   1. Cold Condensate Drains:
      a. Glass Fiber Insulation:
         1) Pipe Size Range: All sizes.
            a) Thickness: 1/2 inch.

END OF SECTION

SECTION 23 11 23
FACILITY NATURAL-GAS PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe, pipe fittings, valves, and connections for natural gas piping systems.

1.02 RELATED REQUIREMENTS

A. Section 23 75 16 - Custom Outdoor Central-Station Dehumidification Units.

1.03 REFERENCE STANDARDS

A. ANSI Z21.18/CSA 6.3 - Gas Appliance Pressure Regulators 2019.
B. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300 2021.
C. ASME B31.1 - Power Piping 2022.
D. ASME B31.9 - Building Services Piping 2020.
E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.
F. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018, with Amendment (2019).
G. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends 2010, with Errata .

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with applicable codes.
B. Valves: Manufacturer's name and pressure rating marked on valve body.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
B. Provide temporary protective coating on cast iron and steel valves.
C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.01 NATURAL GAS PIPING, ABOVE GRADE

A. Steel Pipe: ASTM A53/A53M, Schedule 40 black.
   1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M, wrought steel welding type.
   2. Joints: Threaded or welded to ASME B31.1.

2.02 FLANGES, UNIONS, AND COUPLINGS

A. Unions for Pipe Sizes 3 Inches and Under:

1. Ferrous Pipe: Class 150 malleable iron threaded unions.

B. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.03 PIPE HANGERS AND SUPPORTS

A. Provide hangers and supports that comply with MSS SP-58.
   1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
   2. Rooftop Supports for Low-Slope Roofs: Steel pedestals with bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with support fixtures as specified; and as follows:
      a. Bases: High density polypropylene.
      b. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
      c. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
      d. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports; corrosion resistant material.
      e. Height: Provide minimum clearance of 6 inches under pipe to top of roofing.

2.04 BALL VALVES

A. Construction, 4 Inches and Smaller: MSS SP-110, Class 150, 400 psi CWP, bronze or ductile iron body, 304 stainless steel or chrome plated brass ball, regular port, Teflon seats and stuffing box ring, blow-out proof stem, lever handle, threaded ends.

2.05 LINE PRESSURE REGULATORS AND APPLIANCE REGULATORS INDICATORS

A. Compliance Requirements:
   1. Appliance Regulator: ANSI Z21.18/CSA 6.3.

B. Materials in Contact With Gas:
   1. Housing: Aluminum, steel (free of non-ferrous metals).
   2. Seals and Diaphragms: NBR-based rubber.

C. Maximum Inlet Operating Pressure: 5 psi.
   1. Appliance Regulator: 2 psi.

D. Maximum Body Pressure: 10 psi.
E. Output Pressure Range: 1 inch wc to 80 inch wc.

PART 3 EXECUTION

3.01 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
B. Remove scale and dirt, on inside and outside, before assembly.
C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
D. Install valves with stems upright or horizontal, not inverted.
E. Pipe Hangers and Supports:
    1. Install in accordance with ASME B31.9.
    2. Support horizontal piping as indicated.
    3. Place hangers within 12 inches of each horizontal elbow.

3.03 APPLICATION

A. Install unions downstream of valves and at equipment or apparatus connections.

3.04 SCHEDULES

A. Pipe Hanger Spacing:
    1. Metal Piping:
        a. Pipe Size: 1/2 inches to 1-1/4 inches:
            1) Maximum Hanger Spacing: 6.5 ft.
        b. Pipe Size: 1-1/2 inches to 2 inches:
            1) Maximum Hanger Spacing: 10 ft.

END OF SECTION

SECTION 23 21 13
HYDRONIC PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Equipment drains and overflows.
B. Pipe hangers and supports.

1.02 RELATED REQUIREMENTS

A. Section 23 07 19 - HVAC Piping Insulation.

1.03 REFERENCE STANDARDS

A. ASME B31.9 - Building Services Piping 2020.
B. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120 2021a.
C. ASTM D2466 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40 2021.
D. ASTM D2467 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 2020.
E. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets 2020.
F. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018, with Amendment (2019).

1.04 DELIVERY, STORAGE, AND HANDLING

A. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
B. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.01 EQUIPMENT DRAINS AND OVERFLOWS

A. PVC Pipe: ASTM D1785, Schedule 40, or ASTM D2241, SDR 21 or 26.
   1. Fittings: ASTM D2466 or D2467, PVC.
   2. Joints: Solvent welded in accordance with ASTM D2855.

2.02 PIPE HANGERS AND SUPPORTS

A. Hangers for Pipe Sizes 1/2 to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
B. Hangers for Cold Pipe Sizes 2 Inches and Greater: Carbon steel, adjustable, clevis.
C. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.
D. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.03 FLOW CONTROLS

A. Construction: Class 125, Brass or bronze body with union on inlet, temperature and pressure test plug on inlet and outlet, blowdown/backflush drain.
B. Calibration: Control flow within 10 percent of selected rating, over operating pressure range of 10 times minimum pressure required for control, minimum pressure 2 psi.

PART 3 EXECUTION

3.01 PREPARATION

A. Prepare piping connections to equipment using jointing system specified by manufacturer.
B. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.02 INSTALLATION

A. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.
B. Route piping in orderly manner, parallel to building structure, and maintain gradient.
C. Install piping to conserve building space and to avoid interference with use of space.
D. Slope piping and arrange to drain at low points.
E. Pipe Hangers and Supports:
   1. Install in accordance with ASME B31.9, ASTM F708, or MSS SP-58.
   2. Support horizontal piping as scheduled.
   3. Place hangers within 12 inches of each horizontal elbow.

3.03 SCHEDULES

A. Hanger Spacing for Plastic Piping.
   1. 1 Inch: Maximum span, 51 inches; minimum rod size, 1/4 inch.
   2. 1-1/4 Inches: Maximum span, 57 inches; minimum rod size, 3/8 inch.
   3. 1-1/2 Inches: Maximum span, 63 inches; minimum rod size, 3/8 inch.

END OF SECTION

SECTION 23 75 16
CUSTOM OUTDOOR CENTRAL-STATION DEHUMIDIFICATION UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Custom built air handling units shall be supplied to meet the performance requirements shown on the equipment plans and specifications. To comply with job site constraints and/or freight restrictions, the units shall be shipped in sections for field installation on roof curb. Shipping details shall be coordinated and included with submittal drawings.
B. Units shall be provided with stand-alone factory programmed DDC controls mounted and wired, and have a BACnet, MS/TP interface to the building automation system.

1.02 RELATED REQUIREMENTS

A. Section 26 05 83 - Wiring Connections.

1.03 REFERENCE STANDARDS

A. The design and fabrication of the units shall be in accordance with the latest standards listed herewith:
   1. AFBMA 9 Load ratings and fatigue life for ball bearings
   2. AHRI 1060 Air to air energy recovery components
   3. AMCA 203 Field performance measurements
   4. AMCA 210 Laboratory methods of testing fans for rating purposes
   5. AMCA 310 Test code for sound rating air moving devices
   6. AMCA 500 Test methods for louvers, dampers and shutters
   7. ARI 410 Forced-circulation air cooling and air heating coils
   8. ASHRAE 62-89 Ventilation for acceptable indoor air quality
   9. ASTM A525 Steel sheet, zinc coated by hot-dip process
   10. ASTM E90-90
   11. ETL Compliance: Complete unit shall be listed and labeled ETL per standards ANSI/UL 1995 and CAN/CSA
   12. NEMA MG1 National electrical manufacturers association (Motors and generators)
   13. NFPA 70 National fire protection code
   14. NFPA 90A Installation of Air Conditioning and Ventilation Systems
   15. OSHA Occupational safety and health administration
   16. SMACNA HVAC metal duct association
   17. UL 900 Underwriters laboratory, (test performance of air filters quality)
   18. UL Compliance: Electrical components shall be listed and labeled UL.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures
B. The unit manufacturer shall provide submittal drawings showing the arrangement of each unit, nominal dimensions, weight of each shipping module and complete technical data for all mechanical and electrical accessories provided with the HVAC units.
C. The drawings shall detail the cross-section of the floor, perimeter structure, panel assembly, sealing between panels and detailing of all components including the material and thickness of all cabinetry components.

D. Fan performance ratings shall have been based on tests and procedures performed in accordance with AMCA publication 211 and AMCA publication 311 and comply with the requirements of the AMCA Certified Ratings Program. The fan operation point shall be clearly indicated including the impact of any system effect factors. For reference purposes, a family of performance curves shall be included for each fan. Sound power levels shall be provided for the fan inlet and discharge at each octave band. Construction drawings for each fan shall be included with the submittal drawing file.
E. Heat transfer coils' selection data for each coil shall be included with the submittal drawing file. The selection must indicate all input & output values as well as the characteristics of the fluids. Construction drawings for each coil bank shall be included with the submittal drawing file.
F. A detailed description of the filters including their “dust spot” efficiency evaluated under ASHARE standard 52.1-1992, UL class, initial and final pressure losses for each filter bank shall be provided with the submittal drawings.
G. The unit manufacturer shall provide technical data for all other equipment being part of the air handling system. The data shall include: Performance and capacity information; certified drawings, clearly showing the arrangements; electrical interfaces; and weight.
H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. See Section 01 6000 - Product Requirements, for additional provisions.
    2. Extra Filters: One set for each unit.

1.05 QUALITY ASSURANCE

A. The unit shall be specifically designed, manufactured and tested for specialized pool dehumidification/custom packaged refrigeration duty. Field assembled or modified standard commercial grade equipment shall not be accepted.
B. The units shall be produced by a manufacturer whose design and processes are thoroughly documented and verifiable with minimum 5 years experience. The quality control program shall ensure the consistency of the product and the effectiveness of the production processes.
C. Where a standard quality is specified for a major component, one of the acceptable manufacturers and models specified herein shall be provided. Components must be sourced from well recognized HVAC manufacturers whose products comply with their product-specific industry standards.
D. Air and sound performance of all air moving equipment shall conform to the AMCA standards and must bear the AMCA certification label.
E. Heating and cooling coil capacity ratings shall be certified in accordance with ARI standard 410. Heat transfer coils shall bear the ARI certification label.
F. Filter media shall be UL listed.

1.06 DELIVERY, STORAGE AND HANDLING

A. The units shall be thoroughly cleaned and inspected before applying a shrink wrapping protective cover. The plastic cover must completely enclose all shipping modules individually.
B. The units must be shipped completely assembled or in modules, as documented in the specifications or instructed by the contractor. The units and/or modules shall be equipped with adequately sized and removable lifting lugs for field rigging and handling.
C. The units must be handled carefully in the field to avoid damaging internal components, cabinet walls and the exterior finish.
D. Store the units in a dry, clean environment protected from the outdoor weather. Factory applied shrink wrap is intended to protect the units while in transit to the job site. The units must not be

stored with the factory applied shrink wrap.

E. The units must not be operated, for temporary or permanent purposes, until the official start-up is completed by the mechanical contractor and witnesses by a manufacturer's representative.
F. The contractor shall be responsible for inspecting the units upon arrival at jobsite.

1.07 WARRANTY

A. The manufacturer shall warranty the equipment, parts only, for a period of one year commencing at the date of unit start-up, up to a maximum of eighteen months from the date of shipment.
B. Special Warranty: The manufacturer shall submit a written warranty agreeing to repair or replace components that fail in materials or workmanship within the specified warranty period. The warranty does not include parts associated with routine maintenance, such as belts, air filters, etc.
   1. Furnace: Twenty (20) year non-prorated parts warranty shall be provided for all indirect gas furnace heat exchangers. The warranty period shall begin at start up or six (6) months after shipment, whichever occurs first.
   2. Compressor: Five (5) year non-prorated parts warranty shall be provided for the compressors. The warranty period shall begin at start up or six (6) months after shipment, whichever occurs first.
   3. Flat Plate: A ten (10) year non-prorated parts warranty shall be provided for all flat plate air-to-air heat exchangers. The warranty period shall begin at start up or six (6) months after shipment, whichever occurs first.

PART 2 PRODUCTS

2.01 GENERAL

A. Manufacturers
   1. Innovent; Model NDHU.
   2. Alternate manufacturers Energy Labs, Ingenia, Mammoth shall meet the following requirements;
      a. Alternate approved manufacturers shall be pre-approved prior to bidding and shall be subject to compliance with all the requirements listed in this specification. Pre-approval shall not relieve alternate manufacturers from compliance with requirements of this specification. Alternate manufacturers shall match the basis of design unit configurations, dimensions, weights, capacities, unit air tunnel velocities, coil velocities, filter configurations and velocities as well as the overall construction characteristics specified herein.
      b. Alternate manufacturers seeking approval shall provide a pre-bid unit submittal to receive consideration. In requesting approval, alternate manufacturers shall provide three reference installations that have been in operation for a minimum of 5 years located within 300 miles of the jobsite for the engineer to contact. The reference installations shall be of similar application, design, features and construction to the specified equipment for this project and of equal capacity to the largest unit on this project. For each reference installation, provide an owner contact name, phone number, the equipment submittal for the unit(s), the manufacturer’s representative and the date of installation.
      c. Manufacturer’s local representative shall employ or contract with local factory trained and certified service technicians with capability to support the equipment for factory authorized start-up, warranty and service, including manufacturer’s start-up forms and requirements, control interface, wiring and wiring schematics, packaged refrigeration systems, gas heat, and energy recovery devices.

d. Project is based on the specified equipment. Any additional re-engineering or installation costs associated with using alternate manufacturer's equipment shall be borne by the installing contractor.

2.02 QUALITY ASSURANCE

A. All unit(s) shall be factory run tested before shipping. A proof copy of the test shall be placed in the unit electrical power & control panel. Unit(s) shall bear the ETL label, tested in accordance to UL 1995. Electrical components shall be UL listed; fans shall be tested in an AMCA certified laboratory; insulation shall comply with NFPA 90A; coils shall tested in accordance to ARI 410 ; energy recovery exchangers shall be in accordance to AHRI 1060, "Rating Air-to-Air Energy Recovery Equipment" and Eurovent standards; filters shall be tested in accordance to ASHRAE 52.

2.03 UNIT ARRANGEMENT

A. The unit shall have a 15' minimum horizontal separation from any exhaust point to any outdoor air intake, including any Purge Mode exhaust points and outdoor air intakes, to inhibit re-entrainment of airborne pool chemicals, moisture removed for dehumidification, and icing of filters and dampers in the outdoor air intake.
B. Duct connections shall be located as shown on the drawings. Duct connection sizes shall not have a higher face velocity or different aspect ratio than the specified unit.
C. Air tunnels shall be arranged as shown on the drawings. Unit height and width shall not be less than the specified unit height and width.
D. Filters shall be located within the unit cabinet (not in an external sleeve or in the hood).
E. All outdoor air intake sections shall be provided with 2" pleated MERV-8 filters at minimum, including normal mode and purge mode intakes.
F. Maintenance access space and airflow transition space between components shall be provided as shown on the drawings. Unit length shall not be less than the specified unit length.
G. Fans and/or filters shall not be face mounted on coils or heat transfer components.
H. The outdoor air intake shall not be located after the unit heating device to prevent risk of condensation and stratification.
I. Purge Mode shall not require operation of an exhaust fan residing in the corrosive return plenum that is off in normal mode operation.
J. Recirculation air damper shall not be located under an air-air heat exchanger due to condensate carryover at the air velocity through the damper.

2.04 CONSTRUCTION

A. General. Construct unit with materials and features as specified herein. Provide structural base and tube frame to house inset wall, ceiling and floor panels. Unit construction shall meet Cabinet Performance specified in this section. Structural tube frame and panel construction shall be provided with no individual panel exceeding 36" width. All panels on the unit shall be fully removable without the use of cutting tools. All internal components shall be removable without compromising the structural integrity of the unit. Unit shall be suitable for outdoor installation as detailed on the plan drawings.
B. Cabinet Performance. Unit construction shall meet the following minimum performance criteria.
   1. Base Deflection. Design structural base to limit deflection to ¼" in length and width when rigging the unit according to manufacturer recommendations. Provide engineering calculations demonstrating compliance with this requirement.

2. Cabinet Deflection. Construct cabinet to limit deflection of the walls and roof to L/250 at 8" w.c. static pressure, or 1.5 times the maximum static pressure within the unit at design conditions, whichever is lower. Deflection ratings for panels only shall not be accepted.
3. Floor Deflection: Maximum floor deflection shall be L/500 (L=span in inches) when subjected to an 800 lb/sq ft. point load. Provide test data demonstrating compliance with this requirement.
4. Casing Air Leakage. Maximum casing leakage shall meet SMACNA duct leakage class (DLC) rating of 5.0. Provide calculations demonstrating compliance with this requirement.
5. Casing Insertion Loss (Acoustic rating). The panel insertion loss, per octave band, shall not be less than the following:

Frequency (Hz):	100	125	250	500	1000	2000	4000	8000
Insertion Loss (dB):	24	16	30	32	33	34	63	60

6. Thermal Performance. All interior walls, floor, and ceiling shall be double wall and insulated with polyurethane injected foam insulation having a minimum R- value of 6.3 - 7.1/inch. Fiberglass or non-injected foam insulation is not acceptable and will be rejected.

C. Base. Base shall be constructed of welded 10 ga. structural steel G channel perimeter and C channel cross members with integral lifting lugs. Units without a welded structural steel base that utilize lifting provisions near the top of the cabinet shall be unacceptable. Bolted bases shall not be acceptable. Coat base exterior with 2 part epoxy primer and urethane modified enamel topcoat. Removable lifting lugs shall be provided. Weep holes shall be provided in base channels. Base height shall be a minimum of 8" to facilitate proper trapping of drain.

D. Frame. Frame shall be constructed of structural tube members designed to support flush-mounted double-wall panels. Vertical frame members shall be easily removable without the use of specialty tools or torches for replacement of large internal components. Welded frame shall not be accepted unless all internal components can be easily removed without cutting any welds. A closed-cell polyvinyl foam gasket with a thickness of 3/16” or greater shall be applied between all frame members and panels, providing a thermal break between the panels and the structural frame. Units without a structural tube frame shall be unacceptable. Frame Material shall be extruded 6063 aluminum tube.

E. Floor. Floor shall be 2” thick double-wall, foam injected panel construction for optimal support strength. Floor shall be a fastener free design, bonded to the unit base with a structural adhesive. All seams shall be finished with an adhesive sealant providing a watertight floor system. Use of tack welding, caulk or screws penetrating the entire floor panel anywhere in the floor shall not be accepted. The floor shall have a smooth and flat walk-on surface. A minimum 1" lip shall be provided around all floor penetrations. Walk-on grating shall be provided over all accessible floor mounted duct connections. Paneled floor shall be constructed of a minimum of .063" 5052-H32 mill-finished aluminum walk on surface and 22 gauge galvanized steel underside surface.

F. Wall and Ceiling Panels. Unit shall have non-load bearing, fully removable, heavy gauge 2" double-wall panels which fully encapsulate the injected foam insulation. No individual panel shall exceed 36” width. Panel edges utilizing PVC edge wrappers to cover the insulation shall not be accepted. Panels shall be manufactured with an integral thermal break.
1. Exterior Materials: Exterior skin shall be pre-painted steel,
2. Exterior Finishes/Coatings A textured polyester paint (color to match existing screen panels) shall be provided. Coating shall be salt spray tested per ASTM B117 for a minimum of 2,500 hours and have no blistering or red rust on the face when the testing is completed.

3. Interior Materials: Interior skin shall be 5052-H32 mill-finished aluminum.

G. Thermal Break Construction. The casing (panels and frame) excluding doors, shall meet AHRI 1350 CB-1 requirements.
H. Insulation. Insulation shall be a product of a manufacturer specializing in insulating materials. All walls, floor, and ceiling shall be double wall and insulated with polyurethane injected foam insulation. Provide a data sheet from the insulation manufacturer confirming an R-value of 6.3 - 7.1 per inch. No insulation shall be exposed to the airstream. Non-injected foam board insulation or air handler manufacturer produced insulating material shall not be accepted. Fiberglass, mineral wool, and non-injected foam board insulation shall not be accepted.
I. Access Doors. Provide double wall doors with the same insulation and inner/outer wall material as the wall panels. Doors shall have an integral aluminum frame and shall be mounted into the structural frame of the unit. Door openings cut into casing panels shall not be accepted. Doors shall be full height (up to 72") with industrial continuous stainless steel hinges. Bi-directional compression latches with integral roller cam and hex-screw locking assembly shall be provided. An EPDM type door gasket shall be provided in accordance with ASTM D 2000. Supply and exhaust airstreams shall not be covered by a single door. Access panels in lieu of access doors shall not be accepted. Rain gutters shall be provided over all access doors that are not the full height of the unit casing. All doors that open with pressure shall be provided with a pressure relief safety latch. Access doors shall be provided for sections requiring routine maintenance.
J. Weather hoods: Provide weather hoods with expanded aluminum bird screens over all exposed inlets and outlets. Hoods may ship loose for installation in the field.
K. Roof: Provide roof with standing seam construction which allows removal of individual sections for inspection purposes without removal of the entire roof. A double wall foam injected panel shall be provided below the roof liner creating 3 layers of metal between the conditioned air tunnel and ambient air. Pitch roof with sufficient slope to ensure water drainage. Units over 137" wide require double sloped roof designs. Roof overhang to be provided around complete perimeter of the unit. No penetrations shall be made to the roof.

2.05 FIXED PLATE HEAT EXCHANGERS

A. Provide cross flow air-to-air flat plate heat exchangers with thermal performance, pressure drop, resistance to deformation, material for heat transfer surface, end plates, corners, and frames, method of sealing, leakage rating, pressure differential resistance rating, and warranty as specified herein and scheduled.
B. Construction. The heat exchanger shall be constructed with the following features:
   1. Heat exchanger plates shall be 8 mil thickness 3003 series aluminum. Plate thickness shall be identified and certified in submittals.
   2. End plates, corners, and frames shall be constructed of aluminum. Full tube frames shall be provided for strength. Formed steel end plates and/or heat exchangers without a full aluminum tube frame shall not be allowed. Formed angle pieces shall not be provided in lieu of the specified aluminum tube frame.
   3. Plate edges shall be both mechanically and with sealant, and the plate corners shall be sealed to the aluminum tube frame to limit cross contamination leakage.
   4. Plates shall be completely smooth, with no dimples or corrugations for contaminants to adhere to. Plate spacing shall be maintained by rigid integral standing ribs spaced every two inches of width. If dimples or corrugations are used for plate separation and/or to create turbulence, a water wash spray manifold with brass nozzles, stainless steel nozzle

holders, and a hose bibb connection shall be provided to facilitate cleaning of the heat exchanger at no additional cost to owner.

5. Airflow path shall be straight through for low pressure drop, ease of surface inspection, washing, and to prevent deposition of contaminants. Counterflow heat exchangers do not meet this requirement and shall not be accepted.

C. Ratings. The heat exchanger shall have the following ratings:
   1. Maximum operating differential pressure. The heat exchanger shall be capable of operating up to 10" w.c. differential pressure at 70°F.
   2. Air Leakage. Air leakage shall be no more than 0.1% of airflow at 3" w.c. pressure differential.

D. Performance. The heat exchanger shall meet the following performance criteria:
   1. Heat exchanger thermal performance shall be as scheduled.
   2. Pressure drop shall not exceed the scheduled values. Pressure drop shall be corrected due to plate deflection resulting from operating pressure differential if required by the heat exchanger manufacturer. The corrected value shall not exceed the scheduled value.

E. Mounting in the Air Handler. The heat exchanger shall be applied in the air handler in the following manner:
   1. Heat exchanger shall be mounted in the diagonal orientation with the plates vertical to facilitate condensate drainage.
   2. Clean-in-place design. Provide exhaust air drain pan to collect condensate during cold weather operation and wash water when maintenance is required. Provide outside air drain pan to collect wash water when maintenance is required. Drain pans shall be double- sloped per IAQ requirements and shall be constructed of aluminum. Drain pan coverage shall extend below the entire heat exchanger. Drain connections shall be through the side of the unit.
   3. If the heat exchanger is not manufactured by the unit manufacturer, provide written certification that all heat exchanger manufacturer recommendations affecting airflow and performance have been incorporated into the air handler design, including recommended transition space to fans and clearances from the top and bottom of the plenum. Include a list of the recommendations and demonstrate that the air handler is in compliance.

F. Aluminum drain pan.
G. Drain lines shall be properly trapped and freeze protected by the installing contractor.
H. Provide Magnehelic differential pressure gages across the outside air and exhaust air sides of both air-to-air heat exchanger sections.
I. Acceptable Manufacturers. Innovent (basis of design), or approved equal by Heatex AB, model P only, pressure resistant crossflow heat exchange.

2.06 FANS/MOTORS

A. Exhaust Fans;
   1. Standard of Quality. Fans shall be Greenheck APD, Twin City EPQN, or Cook model PLC with construction details as specified below.
   2. Wheel. The fan wheel shall be non-overloading centrifugal type. Wheel shall be statically and dynamically balanced to balance grade G6.3 per ANSI S2.19.
      a. The exhaust fan wheel shall be manufactured with a minimum of seven, stitch welded aluminum backward curved blades.
      b. Fan wheel shall be finished with an acrylic urethane protective coating to inhibit corrosion.

c. The wheel and fan inlet shall be carefully matched and shall have precise running tolerances for maximum performance and operating efficiency.

3. Construction. Plenum fans shall be of the unhoused direct drive centrifugal type.
   a. Fan plate shall be aerodynamically designed with high-efficiency inlet, engineered to reduce incoming air turbulence.
   b. Panels and framework shall be constructed of precision laser cut and die formed galvanized steel to provide a rigid structure to support the drive motor, shaft, bearings and wheel and reduce low frequency vibration.
   c. Each fan shall be given an electronic vibration analysis in accordance with ANSI/AMCA Standard 204, while operating at the specified fan RPM. The vibration signatures shall be taken at motor mounting pedestal in the horizontal, vertical and axial direction. The maximum allowable fan vibration shall be 0.10 in./sec peak velocity, filter-in as measured at the fan RPM.
   d. Steel parts shall be coated with Hi-Pro Polyester urethane powder coating or 2 part epoxy primer and urethane modified enamel topcoat.
4. Motor. Motors shall meet or exceed EISA (Energy Independence and Security Act) efficiencies. Motors shall be 3-phase NEMA T-frame, 60 Hz, with RPM as scheduled.
   a. Enclosure shall be Totally Enclosed Fan Cooled (TEFC).
   b. Service factor shall be 1.15.
   c. Insulation shall be Class F.
5. Performance. Conform to ANSI/AMCA Standards 210 and 300. Fans shall be tested in accordance with AMCA Publications 211 and 311 in an AMCA accredited laboratory and certified for air and sound performance. Fans shall be licensed to bear the AMCA ratings seal for air performance (AMCA 210) and sound performance (AMCA 300).
   a. Fan brake horsepower shall not exceed the scheduled brake horsepower at the total static pressure and airflow scheduled.
   b. Provide the number of fans scheduled, no exceptions.
   c. Fan motors shall be selected to run at no more than 90 Hz at design conditions,
6. Mounting. Fan and motor shall be mounted on a unitary isolation base.
   a. Structural steel fan/motor base shall be designed by the manufacturer to properly support the fan/motor assembly to mitigate vibration.
   b. 1” deflection housed seismic rated spring isolators shall be provided.
   c. Fan inlets shall be connected to a double wall foam injected plenum wall.
   d. Fans shall be connected to the plenum wall with canvas flex connectors with edge caps.

B. Supply Fan;
1. Standard of Quality. Fans shall be Greenheck APM, Twin City EPQN, or Cook model PLC with construction details as specified below.
2. Wheel. The fan wheel shall be non-overloading centrifugal type. Wheel shall be statically and dynamically balanced to balance grade G6.3 per ANSI S2.19.
   a. Wheel shall be manufactured with a minimum of 12 continuously welded aluminum airfoil blades to move the blade pass frequency into the mid-octave bands.
   b. The entire wheel shall be constructed of aluminum to reduce the rotational weight of the wheel and reduce vibration. Blades shall be constructed of 6063-T5 extruded aluminum to ensure precision blade tolerances, improve efficiency and reduce vibration. Wheel hubs shall be cast of 319 aluminum alloy.
   c. Fan shall be painted with a Hi-Pro polyester corrosion resistant coating.

d. The wheel and fan inlet shall be carefully matched and shall have precise running tolerances for maximum performance and operating efficiency.

3. Construction. Plenum fans shall be of the unhoused direct drive centrifugal type.
   a. Fan plate shall be aerodynamically designed with high-efficiency inlet, engineered to reduce incoming air turbulence.
   b. Panels and framework shall be constructed of precision laser cut and die formed galvanized steel to provide a rigid structure to support the drive motor, shaft, bearings and wheel and reduce low frequency vibration.
   c. Steel parts shall be coated with Hi-Pro Polyester urethane powder coating or 2 part epoxy primer and urethane modified enamel topcoat.
4. Motor. Motors shall meet or exceed EISA (Energy Independence and Security Act) efficiencies. Motors shall be 3-phase NEMA T-frame, 60 Hz, with RPM as scheduled.
   a. Enclosure shall be Totally Enclosed Fan Cooled (TEFC).
   b. Service factor shall be 1.15.
   c. Insulation shall be Class F.
5. Performance. Conform to ANSI/AMCA Standards 210 and 300. Fans shall be tested in accordance with AMCA Publications 211 and 311 in an AMCA accredited laboratory and certified for air and sound performance. Fans shall be licensed to bear the AMCA ratings seal for air performance (AMCA 210) and sound performance (AMCA 300).
   a. Fan brake horsepower shall not exceed the scheduled brake horsepower at the total static pressure and airflow scheduled.
   b. Provide the number of fans scheduled, no exceptions.
   c. Fan motors shall be selected to run at no more than 90 Hz at design conditions.
6. Mounting. Fan and motor shall be mounted on a unitary isolation base.
   a. Structural steel fan/motor base shall be designed by the manufacturer to properly support the fan/motor assembly to mitigate vibration.
   b. 1” deflection housed seismic rated spring isolators shall be provided.
   c. Fan inlets shall be connected to a double wall foam injected plenum wall.
   d. Fans shall be connected to the plenum wall with canvas flex connectors with edge caps.
7. Fan Venturi Airflow Measurement;
   a. Manufacturer: Greenheck Model Sure-Aire.
   b. Flow monitoring station shall monitor the pressure difference between the fan inlet and the smallest diameter of the inlet cone.
   c. Volumetric flow to be calculated from empirically derived formulas based on testing by the fan manufacturer.
   d. Flow monitoring station shall not use air restricting flow devices that reduce fan performance or create additional fan sound.
   e. Two (2) equidistantly spaced sensor orifices to be drilled in the smallest diameter of the inlet cone venturi. Pressure tubes from each venturi port shall be joined and single averaging tube to the exterior of the fan housing.
   f. High-pressure flow port(s) shall be mounted in low velocity fan inlet. Flow ports from the high-pressure sensor shall extend to the exterior of the fan housing.
   g. Termination locations shall include a low-pressure connection, a high-pressure connection and a listing of the empirically determined flow rate coefficient.
   h. Flow monitoring station to be supplied with electronics package that includes pressure transmitter and LCD digital readout. Electronics package shall accurately measure the pressure differential to within +/- 3%.

2.07 FILTERS

A. General Requirements. Provide filters as specified in this section. Filter racks shall be blanked off to the unit casing to inhibit air bypass. Filters shall be located within the air handling unit cabinet and shall not be in a hood or duct sleeve outside of the air handler cabinet.
B. Outside Air Pleated Filter: Provide a flat bank or V-bank filter section as shown on the unit drawing and as follows:
   1. Depth and Rating: 2", MERV 8.
   2. Location: Mount filters immediately downstream of the outside air inlet.
   3. Rack: Provide an aluminum side access slide rack. Rack shall include vertical formed U-channels attached to the frame at intervals across the rack to protect against filter media getting pulled through the rack.
   4. Face Velocity: Provide filters sized for 500 fpm maximum face velocity, but no higher than the scheduled value.
   5. Filters shall be rated per U.L. standard 900.

C. Return Air Filter: Aluminum filter (washable), provide a flat bank or V-bank filter section as shown on the unit drawing and as follows:
   1. Depth: 2".
   2. Location: Mount filters immediately after the return air inlet or as shown on the unit drawing.
   3. Rack: Provide an aluminum side access slide rack. Rack shall include vertical formed U-channels attached to the frame at intervals across the rack to protect against filter media getting pulled through the rack.
   4. Face Velocity: Provide filters sized for maximum 650 fpm face velocity, but no higher than the scheduled value.

2.08 DAMPERS

A. Standard of Quality. Dampers shall be manufactured by Greenheck, Ruskin, or T. A. Morrison, with specific models called out below.
B. Outside Air Damper, air measuring control damper:
   1. Aluminum Frame and Blade Dampers, Airfoil Blade.
      a. Construction.
         1) Frame Material: 0.125” thick aluminum, 5” x 1” hat channel.
         2) Blade Material: 0.063" thick extruded aluminum.
         3) Blade Type: Airfoil.
         4) Linkage: Plated steel concealed in the jamb (out of airstream). Plastic and/or gear driven linkages shall not be allowed.
         5) Axle Material: Minimum 1/2" plated steel.
         6) Axle Bearings: Acetal (synthetic) sleeve.
         7) Blade Seals: TPE.
         8) Jamb Seals: Stainless steel.
         9) Air Flow Measuring, thermal dispersion type ;
            a) Probes: Each multi-point probe shall be assembled using heavy wall anodized aluminum tubing, aluminum mounting plates, aerodynamically optimized molded sensing apertures to ensure accurate measurement in angular airflow conditions, and neoprene mounting gasket.

b) Transmitter: Each transmitter shall be capable of averaging as many as thirty-two (32) sensor.
c) Controller: Analog or BACnet MS/TP based programmable controller provides;
(1) 0-10 VDC feedback for airflow, temperature and positions of the blade.
(2) 0-10 VDC for setpoints.

b. Ratings. AMCA Class 1A rated at 1" w.c. and Class 1 up to 4-10" w.c. with AMCA certified performance for pressure drop and leakage per AMCA 500-1D, Test Figures 5.2, 5.3, and 5.5. Dampers shall be IECC compliant.
1) Velocity Limit: Suitable for use to 6000 feet per minute.
2) Leakage: 3 cfm/sq. ft (AMCA Class 1A).
3) Temperature Range: -40 deg F to 250 deg F.
4) Pressure Limit: Suitable for use to 10" w.c.

c. Manufacturer and Model Provide Greenheck model AMD42-TD.

C. Dampers shall meet or exceed the following construction and ratings.
1. Heat Exchanger Face Damper; Heat Exchanger Bypass Damper; Recirculation Damper; Exhaust Air Damper:
a. Aluminum Frame and Blade Dampers, Airfoil Blade.
1) Construction.
a) Frame Material: 0.125" thick aluminum, 5" x 1" hat channel.
b) Blade Material: 0.063" thick extruded aluminum.
c) Blade Type: Airfoil.
d) Linkage: Plated steel concealed in the jamb (out of airstream). Plastic and/or gear driven linkages shall not be allowed.
e) Axle Material: Minimum 1/2" plated steel.
f) Axle Bearings: Acetal (synthetic) sleeve.
g) Blade Seals: TPE.
h) Jamb Seals: Stainless steel.
2) Ratings. AMCA Class 1A rated at 1" w.c. and Class 1 up to 4-10" w.c. with AMCA certified performance for pressure drop and leakage per AMCA 500-1D, Test Figures 5.2, 5.3, and 5.5. Dampers shall be IECC compliant.
a) Velocity Limit: Suitable for use to 6000 feet per minute.
b) Leakage: 3 cfm/sq. ft (AMCA Class 1A).
c) Temperature Range: -40 deg F to 250 deg F.
d) Pressure Limit: Suitable for use to 10" w.c.
3) Manufacturer and Model Provide Greenheck model VCD-43, Ruskin CD-50, or T. A. Morrison model 1500.
2. Exhaust Air Gravity Damper;
a. Construction.
1) Frame Material: 0.125" 6063T5 extruded aluminum channel.
2) Blade Material: 0.07" 6063T5 extruded aluminum.
3) Linkage: 1/8" plated steel (out of airstream).
4) Axle Material: Plated steel.
5) Axle Bearings: Acetal (synthetic) sleeve.
6) Blade Seals: Vinyl.
7) Provide with adjustable counter-balance weights.

b. Ratings. Leakage shall be AMCA certified per AMCA Standard 500-D, Test Figure 5.5. Damper leakage shall comply with the current versions of the IECC and ASHRAE 90.1.
   1) Velocity Limit: Suitable for use to 3500 feet per minute.
   2) Temperature Limit: 180 degree F.
   3) Pressure Limit: Suitable for use to 10" w.c.
c. Manufacturer and Model Provide Greenheck model EM-30, Ruskin model CBD-6, or T. A. Morrison model 7600 CWA.

3. The following dampers shall be provided at a minimum (additional dampers may be required, please consult the sequence of operation to determine what is needed):
   a. Outside Air Control Damper, modulating actuator required.
   b. Heat Exchanger Face Damper, modulating actuator required.
   c. Heat Exchanger Bypass Damper, modulating actuator required.
   d. Recirculation Air Control Damper, modulating actuator required.
   e. Exhaust Air Damper, gravity damper.

2.09 INTEGRAL PACKAGED AIR-COOLED REFRIGERATION SYSTEM

A. General Requirements;
1. Provide a custom integral air-cooled packaged refrigeration system factory piped, wired, charged with nitrogen, charged and tested with R-410a and oil.
2. Refrigeration system shall be custom designed to provide energy efficient operation for the specific conditions of this project and performance of each unit.
3. Construction shall integrate into the unit cabinet using the same quality construction and finishes as the cabinet (detailed in this section). Use of a manufacturer's standard pre-designed condensing unit or condenser shall not be accepted. Skid mounting of a standard condenser or condensing unit from another manufacturer shall not be accepted.
4. Use of a refrigerant to water/glycol heat exchanger and fluid cooler for the condenser(s) shall not be accepted due to lower energy efficiency (additional heat exchanger, less efficient heat transfer due to a lack of phase change in the condenser and reheat coils, inefficient glycol required for the working fluid, and the additional maintenance for pumps, expansion tanks, air separator, and the glycol fill).
5. System shall be factory run tested. The run test shall include the following data at a minimum for each circuit and associated compressors, and for both cooling and dehumidification operation:
   a. Verification of compressor crankcase heater operation (where applicable).
   b. Discharge pressure.
   c. % of reheat capacity.
   d. Liquid pressure, temperature and sub-cooling.
   e. Suction pressure, temperature and superheat.
   f. Compressor discharge temperature.
   g. Condenser air temperature rise.
   h. Oil level @ site glass.
   i. Amp draw, % of RLA.
   j. Outdoor ambient temperature and humidity.
   k. Evaporator coil air temperature drop.
   l. Duration of test to achieve steady state prior to data collection (20 minutes minimum).
   m. Refrigerant charge shall be adjusted as required to pass both cooling and dehumidification test with the same charge. The run test form with pass/fail criteria for each parameter shall

be provided with the submittal. The completed forms shall be provided with IOMs upon shipment.

6. Submittal shall include all features as detailed above.

B. Condenser Section Construction:
   1. Condenser section top panel shall be 2" double wall injected foam construction for superior strength and lower vibration. Exterior panel material and finish shall be pre-paint. Interior panel material shall be galvanized. Fan inlets shall be connected to the injected foam top panel.
   2. Condenser coils and condenser fans for each circuit shall be separated from other circuits by a load bearing 2" double wall injected foam panel constructed of galvanized.
   3. Floor shall be 2" double wall injected foam construction with aluminum top panel. Floor panels shall be sealed to the unit base with industrial adhesive to inhibit water leakage. An aluminum floor pan shall overlay the injected foam panel. A provision for draining moisture to the exterior of the unit shall be provided.
   4. Hail guards/vandalism guards shall be provided for all condenser sections.
      a. For units with angled condenser coils, screens shall be constructed of expanded aluminum mesh secured to a formed metal frame matching the unit exterior. Screens shall be mounted vertically to protect the coils, compressors, and refrigeration specialties. The screens shall be removable without use of tools and be self-retaining.
      b. For units with vertical condenser coils, hail guards shall be non-removable expanded aluminum mesh secured to a formed metal frame matching the unit exterior.

C. Minimum System Requirements;
   1. R-410a refrigerant.
   2. Rated Efficiency. Refer to the schedule for the minimum EER requirements for the refrigeration system. Refrigeration systems with EER's less than what is scheduled shall be rejected. Provide calculations demonstrating compliance with the specified EER.
   3. Custom Refrigeration System Performance. Provide all parameters demonstrating integrated, balanced performance of the system and resultant capacity at the design airflow including:
      a. Compressor operating envelope for the compressor selected with superheat, subcooling.
      b. Condenser coil details (fins/rows/fin type and thickness, tube diameter, thickness, and type (smooth, rifled) face area, face velocity, and air pressure drop.
      c. Evaporator coil details (fins/rows, fin type and thickness, tube diameter, thickness, and type (smooth, rifled) face area, face velocity and air pressure drop.
      d. Condenser fan airflow and horsepower.
      e. Refrigerant pressure drop for all components and refrigerant line velocity for all piping runs.
      f. Ambient design temperature and suction and condensing temperatures at design conditions.
   4. Compressor Protection. Provide temperature sensors and pressure transducers on both the suction and discharge sides of the system, and provide active compressor control logic to keep the compressors in the compressor manufacturer's recommend operating envelope (variable capacity compressors), or "three strikes" compressor protection (fixed capacity compressors).
   5. Operating Efficiency. Refrigeration system control logic shall optimize efficiency through control of liquid pressure, condenser airflow and compressor capacity to minimize compressor lift and maximize EER as the load on the system varies.
   6. Low Ambient Operating Temperature. Refrigeration system shall be designed to operate at a minimum outdoor air temperature of 35°F.

D. Refrigeration Circuits; Provide 2 independent circuits completely pressure tested, dehydrated, and factory charged with refrigerant and oil for shipment. Final charge adjustments during commissioning shall be provided by the installing contractor.
   1. Piping Standards. Pipe systems using the following standards at a minimum:
      a. All brazing shall be done with nitrogen purge to prevent oxidation and scaling.
      b. All pipe ends shall be chamfered to limit turbulence, restrictions, and pressure drop. Mandrel-bent piping and long radius copper fittings shall be utilized to limit the number of braze joints and reduce pressure drip.
      c. 15% silver filler shall be used for all copper/copper joints.
      d. 45% silver and white flux shall be used on all other joints.
   2. Provide each refrigeration circuit with the following components:
      a. Filter/Drier: Provide replaceable core type for circuits above 10 tons.
         1) Shutoff valves shall be provided on both sides for servicing.
      b. Liquid line solenoid valve.
      c. Expansion Valve: Electronic type (EEV) provided for circuits with VFD compressors, Thermal type (TXV) for all others.
         1) EEV shall have a dedicated superheat controller.
      d. Anti-cycle function.
      e. Manual reset high pressure switch.
      f. Auto reset low pressure switch.
      g. Refrigerant suction, discharge, and liquid pressure transducers and suction and discharge temperature sensors shall be provided and wired to the main controller. Superheat and subcooling values shall be calculated and available for local or remote diagnostics.
      h. Service/charging valves. Provide at a minimum discharge line, suction line, and liquid line service/charging valves.
      i. A receiver with sight glass shall be provided on circuits with hot gas reheat coils or circuits with low ambient controls.
         1) Provide a pressure relief valve for the receiver.
      j. Shutoff valves shall be provided on both sides of compressors for servicing.

E. Compressors.
   1. Provide hermetic scroll compressor(s) as specified in this section.
   2. Provide compressors for each circuit as follows:
      a. Circuit 1, staged tandem.
      b. Circuit 2, staged tandem.
   3. Compressor Technology. Compressors shall meet the following requirements:
      a. Fixed Speed Scroll. Piping for tandem compressors shall be engineered and provided by the compressor manufacturer, and the performance shall be specifically provided for the tandem set.
         1) Provide scroll compressors with reverse rotation protection, sight glass with moisture indicator (TXV), and oil level adjustment.
         2) Compressors shall be mounted on rubber isolators.

F. Condenser Coils.
   1. Standard of Quality. Provide copper tube/aluminum fin coils as manufactured by Precision Coils, Modine, or Direct Coil meeting all construction features and performance parameters as specified in this section. Microchannel condenser coils shall not be used due to the extremely

dense fin spacing required and inability to repair leaks, requiring replacement of the entire coil.

2. Construction. Provide coils with the following material types and thicknesses:
   a. Fin: 0.006" thick aluminum lanced fins.
   b. Tubes: 0.012" thick seamless copper tubes with rifled interior.
   c. Tube Diameter: 5/16".
   d. Casing: Galvanized steel.
   e. Provide an integral subcooler circuit to ensure a minimum of 10 degrees of liquid subcooling.
3. Performance. Provide coils meeting the following performance parameters:
   a. Condenser design ambient temperature: 95 degrees F.
   b. Condenser airflow face velocity: Maximum 600 fpm, but not to exceed the scheduled value.
   c. Air Pressure Drop: Not to exceed the scheduled value.
   d. Refrigerant Pressure Drop: Maximum 13 psi including condenser subcooler section.
   e. Heat Transfer Surface;
      1) Rows: Provide the number of rows scheduled.
      2) Fin Density: Maximum 16 fins/inch, but not to exceed the number of fins/inch scheduled.

G. Condenser Fans/Motors:
   1. Standard of Quality. Fans shall be Greenheck SE with construction details as specified below.
   2. Wheel. The fan wheel shall be axial type. Wheel shall be statically and dynamically balanced.
      a. The wheel shall be constructed of formed aluminum.
   3. Construction:
      a. Motor drive frame assembly shall be formed galvanized steel channels. Fan panels shall be galvanized steel with formed flanges pre-punched mounting holes, and a deep formed inlet venturi. Motor shall be locked to the fan shaft using a square key and set screw or tapered bushing.
      b. Accessories: Provide powder-coated steel wire fan guard.
   4. Motor. Motors shall be direct drive 1200 rpm maximum, internal rotor AC, as described in this section:
      a. Motor shall be heavy duty OPAO NEMA T-frame, 1200 RPM direct drive, designed specifically for use in a vertical (shaft up) configuration as a condenser fan motor. Bearings shall be permanently lubricated, double sealed ball bearings. Motor shaft shall have a water slinger. Motor shall be variable frequency drive (VFD) compatible. Motor shall be UL recognized and CSA listed.
   5. Performance:
      a. Fan motor horsepower shall not exceed the scheduled condenser fan horsepower.
      b. Provide the number of fans scheduled, no exceptions.
      c. Fan performance shall be tested for airflow and sound in an AMCA certified test lab.

2.10 DX COILS

A. Standard of Quality. Provide coils rated in accordance with AHRI 410-2001 as manufactured by Precision Coils, Modine, or Direct Coil meeting all construction features and performance parameters as specified in this section and the project schedule.
B. Construction. Provide coils with the following material types and thicknesses:
   1. Fin: 0.006" thick aluminum.
   2. Tubes: 0.016" thick seamless copper.
   3. Tube Diameter: 3/8", 1/2", or 5/8" as required.
   4. Casing: 16 ga galvanized steel.

5. Circuiting Type: Interlaced, or as scheduled.

C. Performance. Provide coils meeting the following performance parameters:
   1. System parameters (provide as scheduled):
      a. Fluid: R-410A.
      b. Outdoor ambient temperature: 95 degrees F, or as scheduled.
   2. Face Velocity: Minimum 250 fpm maximum 500 fpm, but not to exceed the scheduled value.
   3. Air Pressure Drop: Not to exceed the scheduled value.
   4. Refrigerant Pressure Drop: Maximum 13 psi.
   5. Heat Transfer Surface;
      a. Rows: Provide the number of rows scheduled.
      b. Fin Density: Maximum 12 fins/inch, but not to exceed the number of fins/inch scheduled.

D. Cooling Coil Drain Pan. All cooling coils shall be provided with aluminum IAQ drain pans that begin at the entering air side of the coil face and extend a minimum of 12” past the leaving air side of the coil face. Entire underside of the drain pan, including the piping run to the casing exterior, shall be coated with no less than 2” of spray foam insulation to ensure no sweating occurs below. Coil shall be installed on “walk-on” supports spaced a maximum of 6” apart to allow full access to the coil face without damage to the drain pan. Pans without the feature shall not be accepted. The drain pan shall be sloped in a minimum of 2 directions to ensure proper drainage. The drain shall be located on the bottom of the drain pan and the connection countersunk below the surface of the drain pan to eliminate the potential for standing water at the connection. No side connections in the pan shall be allowed. An integral intermediate drain pan shall be provided for coils over 44" finned height in applications where condensate is expected. The intermediate pan shall be factory piped to the main drain pan.

E. Piping Connections. All refrigerant connections shall remain inside the unit cabinet and run directly to the condensing section.

2.11 HOT GAS REHEAT COIL

A. Standard of Quality. Provide coils rated in accordance with AHRI 410-200 as manufactured by Precision Coils, Modine, or Direct Coil meeting all construction features and performance parameters as specified in this section and the project schedule.

B. Construction. Provide coils with the following material types and thicknesses:
   1. Fin: 0.006" thick aluminum.
   2. Tubes: 0.016" thick seamless copper.
   3. Tube Diameter: 3/8".
   4. Casing: 16 ga galvanized steel.

C. Performance. Provide coils meeting the following performance parameters:
   1. System parameters (provide as scheduled):
      a. Fluid: R-410A.
   2. Face Velocity: Maximum 800 fpm, but not to exceed the scheduled value.
   3. Air Pressure Drop: Not to exceed the scheduled value.
   4. Refrigerant Pressure Drop: Not to exceed 3 psi.
   5. Heat Transfer Surface;
      a. Rows: Provide the number of rows scheduled.
      b. Fin Density: Maximum 14 fins/inch, but not to exceed the number of fins/inch scheduled.

D. Coil Coatings: Electrofin E-Coat.

E. Modulating control valve.

2.12 INDIRECT GAS FIRED DUCT FURNACE

A. Standard of Quality. Provide in-shot gas heat sections as manufactured by Heatco, LLC. Alternate manufacturers shall be considered only if ALL of the requirements in this section are met. Comply with all mounting and access provisions specified in this section. Drum type gas heaters shall not be allowed.

B. Agency Listings: Provide gas heaters with the following Agency listings:
   1. Listed by Intertek Testing Services (ITS / ETL), a Nationally Recognized Testing Laboratory (NRTL) as a Recognized Component, to the current edition of ANSI Z83.8 / CSA 2.6 Standard for Gas-Fired Duct Furnaces for installation on the positive pressure side of the circulating air blower only.
   2. Listed for application downstream of refrigeration and cooling systems.
   3. Listed for outdoor installation, or for indoor installation in accordance with Category I and Category III venting systems without need for additional power venting.
   4. Duct Furnace shall incorporate a Direct Spark Ignition control module that is design certified by a NRTL to ANSI Z21.20 and CAN/CSA-C22.2.

C. Construction. Provide heat exchanger tubes with the following features, material types and thicknesses:
   1. 409 stainless steel heat exchanger tubes..
   2. Features: Module design shall provide means for removal of condensate that can occur in the heat exchanger tubes during cooling season. Heat exchanger tubes shall have integral formed dimpled restrictors or formed turbulators to provide for an unobstructed drainage path and tubes shall be formed to provide a positive pitch to promote condensate drainage. Drainage shall be configured so that in-shot burners are not exposed to condensate.

D. Performance. Provide heat section meeting the following performance parameters:
   1. System Parameters;
      a. Fuel: Natural gas.
      b. Maximum Inlet Gas Pressure:13.5 “ w.c., Natural Gas or Propane. Pressure reducing valves, if required, shall be by others.
      c. Minimum Inlet Gas Pressure: 5.0” w.c. for input ratings 400 MBH or less, 6.0" w.c. for input ratings greater than 400 MBH.
   2. Capacity: Input and output capacities shall be as scheduled. Scheduled capacity shall include a de-rate if the project altitude is greater than 2000 feet above sea level.
   3. Turndown: One 2-stage control valve and one 5:1 modulating gas valve to provide a total turndown of 10:1.
   4. Air Pressure Drop: Maximum 0.50” w.c. per bank, but shall not exceed the scheduled value.

E. Venting requirements. An induced-draft fan shall be provided for positive venting of combustion gases. Venting provisions shall be provided as follows:
   1. A vertical aluminum vent stack per heater module shall be factory provided to direct the combustion gases away from the combustion air intake.
   2. Mounting in the Air Handler: The following requirements shall be met at a minimum and demonstrated in the submitt:
      a. A removable, fastener free and self-retaining access panel shall be provided for full access to all serviceable components. The panel shall be removable without requiring the use of

tools.

b. A combustion air intake shall be provided and sized appropriately for the heater capacity per the heater manufacturer's recommendation.
c. Heater section shall be configured to provide adequate temperature rise across the heaters to limit condensation of flue gases.
d. The air tunnel shall be configured such that airflow through the heater shall not change direction within the heater to prevent uneven heat transfer and hot spots. Heaters shall not be mounted over supply duct connections.
e. Hinged access doors shall be provided for access both upstream and downstream of heater section.

F. Burners will use Natural Gas (with gas pressure min 7" - max 14" wc) unless otherwise specified.

2.13 ELECTRICAL

A. General Requirements.
1. Units shall be provided fully factory wired per the requirements of this section.
2. Units shall be ETL listed to the Standard for Safety for Heating and Cooling Equipment, ANSI/UL Standard 1995 and CAN/CSA C22.2 No. 236-05. Factory wiring practices, safety provisions, components, and labeling shall be per the requirements of the ETL listing.
3. All major electrical components shall be UL listed.

B. Wiring Requirements.
1. Power wiring shall be enclosed in conduit.
2. Ladder wiring diagrams shall be provided. Lines on the diagram shall be numbered, and the associated wires shall be numbered at both terminations for help in troubleshooting.
3. Wires shall be color coded per voltage (line voltage/120V/24V) in the electrical panel, and per function from the terminal blocks in the electrical/control panel to end devices. Color coding shall be called out on the ladder diagram.
4. Provide units with an SCCR rating of 5kA.
5. Provide dedicated wires to end devices (transducers, analog sensors, etc.) to limit potential electrical interference.
6. Wiring and conduit penetrations through panels or block-offs shall be provided with a grommet per metal surface to protect against electrical short circuiting and abrasion, and sealed with sealant to prevent leakage.

C. Major Components.
1. Non-Fused disconnect shall be provided by the unit manufacturer and mounted by the unit manufacturer.
2. Electrical/Control Panels(s). Provide NEMA 3R panel or panels as required.
a. Provide exterior panels of flush mounted enclosures as shown on the unit drawings.
b. Provide a backplate within the panel for mounting of electrical components, DDC controllers and expansion boards, control transformers, required fusing, service switch, VFDs (where applicable) and terminal blocks.
c. For rooftops units, exterior panels housing VFDs shall be mechanically ventilated and provided with electric strip heaters. Flush mounted panels shall be ventilated by the unit airstream.
3. Motor protection. Motors (including compressors) not controlled using VFDs shall have motor starter protectors and contactors rated for the duty.

D. Accessories.
   1. A manual reset phase loss protection relay shall be provided as part of the compressor/refrigeration protection system. Upon sensing a loss of phase the unit shall be de-energized.
   2. Lights: Provide IP67 rated LED light strips in all access sections. Wire lights to a single switch. Mount light switch near the electrical panel and wire switch to a terminal strip in the electrical panel. A transformer shall be factory provided to provide power to the lighting circuit.
   3. Convenience Receptacles: Provide a GFCI duplex receptacle mounted near the electrical panel and wire receptacle to a terminal strip in the electrical panel. A transformer shall be provided to provide power to the circuit.

E. Factory refrigeration system wiring.
   1. The compressor/refrigeration protection system and associated controls shall be factory wired.

2.14 DDC SYSTEM

A. Manufacturer shall provide a programmable digital control system for each custom unit. A user terminal with LCD display shall provide capability of monitoring operation and changing setpoints through an integral keypad. The user terminal shall be capable of being either unit mounted (UUT) or remote mounted (RUT) using straight through six wire flat cable. The manufacturer shall program the sequence of operation as specified in this section and on the drawings. The program shall include the following:
   1. Unit start-up and shut-down requirements including fan/airflow proving indication and damper actuator end switch indication.
   2. Temperature control for all heating and cooling devices.
   3. Humidity control for all dehumidification devices and processes.
   4. Economizers (dry-bulb, enthalpy, dewpoint, energy recovery) where applicable.
   5. Fan controls for each mode of operation.
   6. Defrost control for all energy recovery devices.
   7. Requirements for modes of operation other than Normal Occupied mode.
   8. Integration of all optional devices (firestats, smoke detectors, pressure transducers, airflow stations, etc) specified in this section.
   9. Alarms;
      a. Informational auto-reset alarms shall be provided and stored for all sensors, end devices, and components, and shall be accessible through the controller user interface.
      b. Manual reset alarms shall be provided as specified for some optional devices (e.g. firestats, freezestats, smoke detectors, fan duct static pressure limits) and where required to protect the space served or the equipment.
      c. A list of standard alarms available to the BAS shall be included in the points list as specified in this section.

B. The controller shall communicate with the Building Automation System (BAS) through a factory provided BACnet MS/TP interface card. A points list necessary to control the equipment, perform the sequence of operation, and informational points required by the BAS shall be provided as specified in this section.
C. The controller shall have the capability through a web-based User Interface to remotely monitor all inputs/outputs, control the user terminal, view status of all alarms including both alarm and cleared time stamps, remotely upload a new program, and view historical and live log data for the past 24

hours. The controller shall save the log data for a rolling 7 days in a csv file that can be downloaded, with the additional capability of storing 31 days of logged data to an external thumb drive.

D. Alarm Indication. DDC controller shall have one digital output for remote indication of an alarm condition. (i.e. Blower current switch, differential pressure switch, damper end switch, supply discharge low limit, freeze stat, fire stat, smoke, dirty filters…). Alarm Indication shall be configurable to indicate only shut down alarms if desired. The type of alarm shall be distinguishable through the BMS.

E. The Equipment manufacturer shall provide the following refrigeration system compressor protections:
   1. Cycle time (minimum OFF and minimum ON).
   2. High saturated discharge temperature.
   3. Low saturated suction temperature.
   4. High pressure trip (manual reset).
   5. Low pressure trip.
   6. High discharge temperature.

F. Miscellaneous Controls.
   1. Filter pressure switches across each filter rack.

G. Sequence of Operation. Manufacturer shall provide the sensors required for the Sequence of Operation, including additional points listed in the BMS Points listed when included in this section. The sequence of operation shall incorporate devices such as smoke detectors, filter switches or transducers, and kill switches specified in the Electrical section of this equipment specification.

H. BMS points list as shown on Drawings.

I. Variable Frequency Drives.
   1. Manufacturer; ABB Model ACH Series.
   2. The drive package as specified herein and defined on the drive schedule shall be enclosed in a UL Type enclosure.
   3. The drive shall provide full rated output from a line of +10% to -15% of nominal voltage across an ambient temperature range of -15 to 40° C (5 to 104° F).
   4. All drives shall utilize the same Advanced Control Panel (keypad) user interface.
      a. Plain English text
         1) The display shall be in complete English words for programming and fault diagnostics.
         2) Safety interlock and run permissive status shall be displayed using predetermined application specific nomenclature, such as: Damper end switch or vibration trip. Customized terms, such as: AHU-1 End Switch or CT-2 Vibration shall also be available.
   5. The control panel shall include at minimum the followings controls:
      a. Four navigation keys (Up, Down, Left, Right) and two soft keys.
      b. Hand-Off-Auto selection, Fault Reset, and manual speed control.
      c. A Help key shall include assistance for programming and troubleshooting.
   6. There shall be a built-in time clock in the control panel with 10-year battery backup.
   7. I/O Summary display with a single screen shall indicate and provide:
      a. The status/values of all analog inputs, analog outputs, digital inputs, and relay outputs.
      b. The function of all analog inputs, analog outputs, digital inputs, and relay outputs.
      c. The ability to force all inputs and outputs to either a high, low, or specific value.

8. The drive shall automatically backup parameters to the control panel. The drive shall allow two additional unique manual backup parameter sets to be stored.
9. The control panel shall be removable, capable of remote mounting.
10. The drive shall be able to support a Bluetooth Advanced Control Panel. The Bluetooth control panel shall be FCC and QDL (Qualified Design Listing) certified.
    a. A free app (iOS and Android) shall replicate the control panel on a mobile device or tablet. The control panel's programming and control functionality shall function on the device. Customizing text, such as AHU-1 End Switch, shall be supported by the device's keyboard.
    b. Bluetooth connectivity shall allow uploading, downloading, and emailing of parameters.
    c. Bluetooth connectivity shall include two pairing modes: Always discoverable with a fixed passcode, and manual discovery with a unique generated passcode every pairing.
    d. Bluetooth connectivity shall be capable of being switched off.
11. All drives shall have the following hardware features/characteristics as standard:
    a. Two (2) programmable analog inputs, two (2) programmable analog outputs, six (6) programmable digital inputs, and three (3) programmable Form-C relay outputs.
    b. The drive shall include an isolated USB port for interface between the drive and a laptop.
    c. An auxiliary power supply rated at 24 VDC, 250 mA shall be included.
    d. Harmonic mitigation hardware shall be provided to limit the current distortion to 3% total harmonic current distortion, when measured at the lugs of the drive. The harmonic mitigation hardware shall be internal to the drive package and include the following characteristics:
        1) An IGBT based active front end shall be used for mitigation of low frequency harmonics. A LCL filter shall be installed in front of the IGBTs to remove high frequency harmonics.
        2) The drive shall provide full motor nameplate voltage while operating the motor at nameplate RPM. The output IGBTs must be modulating and in control of the motor during this 100% speed/load operating condition. The specified 3% current distortion and 1.0 displacement power factor shall be achievable during this operating condition.
        3) The hardware structure of the front end shall boost the DC bus voltage by 10% during low line conditions.
        4) Displacement power factor shall be 1.0 throughout the speed range.
        5) The combined harmonic content of all the drives on the project must be small enough to not interfere with an emergency generator's voltage regulator. Drives capable of regeneration shall not be allowed on applications with a generator.
12. The drive shall have variable speed primary cooling fans.
13. The overload rating of the drive shall be 110% of its normal duty current rating for 1 minute every 10 minutes, 135% overload for 2 seconds every minute.
14. The input current rating of the drive shall not be greater than the output current rating.
15. Circuit boards shall be coated per IEC 60721-3-3; Chemical gasses Class 3C2 and Solid particles Class 3S2.
16. Coordinated AC transient surge protection system consisting of 4 MOVs (phase-to-phase and phase-to-ground), a capacitor clamp, and internal chokes. The MOVs shall comply with UL 1449 4th Edition.
17. The drive shall include a robust DC bus to provide short term power-loss ride through. An inertia-based ride through function should help maintain the DC bus voltage during power loss events. Drives with control power ride through only, are not acceptable.
18. All drives shall have the following software features as standard:

a. A Fault Logger that stores the last 16 faults in non-volatile memory. The most recent 5 faults save at least 9 data points, including but not limited to: Time/date, frequency, DC bus voltage, motor current, DI status, temperature, and status words.
b. An Event Logger that stores the last 16 warnings or events that occurred, in non-volatile memory. Events shall include, but not limited to: Warning messages, checksum mismatch, run permissive open, start interlock open, automatic reset of a fault, power applied, auto start command, auto stop command, modulating started, and modulating stopped.
c. Programmable start method. Start method shall be selectable based on the application and function even if the motor was freewheeling in the reverse direction: Flying-start, Normal-start, and Brake-on-start.
d. Programmable loss-of-load (broken belt / coupling) indication. This function to include a programmable time delay to eliminate false loss-of-load indications.
e. Motor heating function to prevent condensation build up in the motor. Motor heating adjustment, via parameter, shall be in "Watts."
f. There shall be a run permissive circuit for damper or valve control.
g. Four separate start interlock (safety) inputs shall be provided. The control panel will display the specific safety(s) that are open.
h. The drive shall include a switching frequency control circuit that reduces the switching frequency based on actual drive temperature. It shall be possible to set a minimum and a target switching frequency.
i. The ability to automatically restart after non-critical faults.
j. PID functionality shall be included in the drive.
k. Drive shall be compatible with an accessory that allows the control board to be powered from an external 24 VDC/VAC source.
l. A computer-based software tool shall be available to allow a laptop to program the drive. The drive shall be able to support programming without the need for line voltage. All necessary power shall be sourced via the laptop USB port.
m. The drive shall include a fireman's override mode.

19. Security Features
    a. The drive manufacture shall clearly define cybersecurity capabilities for their products.
    b. The drive shall include passcode protection against parameter changes. There shall be multiple levels of passcode protection including: End User, Service, Advanced, and Override.
    c. A checksum feature shall be used to notify the owner of unauthorized parameter changes made to the drive.
    d. The "Hand" and "Off" control panel buttons shall have the option to be individually disabled (via parameter) for drives mounted in public areas.
20. Network Communications
    a. The drive shall have an EIA-485 port with removable terminal blocks. The onboard protocols shall be BACnet MS/TP, Modbus, and Johnson Controls N2. Optional communication cards for BACnet/IP and LonWorks shall be available.
    b. The drive shall have the ability to communicate via two protocols at the same time, one onboard protocol and one option card based protocol.
    c. The drive shall not require a power cycle after communication parameters have been updated.
    d. The embedded BACnet connection shall be a MS/TP interface. The drive shall be BTL Listed to Revision 14 or later.

21. Disconnect – A circuit breaker or disconnect switch shall be provided when indicated on the drive schedule. The disconnect shall be door interlocked and padlockable. Drive input fusing shall be included on all packaged units that include a disconnecting means. All disconnect configurations

2.15 ADDITIONAL FEATURES AND OPTIONS

A. Control features
   1. Dirty filter switch

B. Door interlocking switch (for fan section)
C. Magnehelic gauges (Dwyer 2000 model)
D. Condensate overflow switch (for drain pans)
E. OA Air Flow Monitoring Package - IAQ-TEK
   1. The IAQ-TEK probe, transducer and monitor are designed to monitor OA and RA unit airflows. To monitor airflows within the OA intake and RA mixing plenum.

F. Fan Airflow Monitoring Station Package
   1. The unit shall be delivered with factory installed airflow measuring system. The airflow measuring system, consisting of a piezometer ring and transducer, shall be installed on the fan. The package consists of an inlet port on the fan inlet cone connected with flexible tubing to the transducer.

G. One Spare sets of Filters

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's Installation, Operation & Maintenance instructions.
B. Contractor shall NOT use the units to provide temporary heating, cooling, or ventilation during the building construction.

3.02 FIELD QUALITY CONTROL

A. After the equipment is installed, the manufacturer’s representative shall inspect the installation and recommend any corrective actions. Do not start up the equipment until the following operations are completed:
   1. All controls are installed and fully operational.
   2. Power is connected to the unit.
   3. Shipping materials have been removed.
   4. Filtration media is installed and clean.
   5. Piping and duct connections are installed and operational.
   6. All wiring, refrigerant piping, gasketing and hardware are properly installed on any multiple section units.

3.03 ENVIRONMENTAL REQUIREMENTS

A. Do not operate units for any purpose, temporary or permanent, until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

END OF SECTION

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SECTION INCLUDES

A. Basic Electrical Requirements and materials specifically applicable to Division 26 Sections, in addition to Division 1 - General Requirements. Section includes:
   1. Electrical Identification.
   2. Minor Demolition.
   3. Conductors and Devices.
   4. Raceways and Boxes.
   5. Supporting Devices.

1.03 REGULATORY REQUIREMENTS

A. Conform to NFPA 70 - National Electrical Code, 2014 edition with amendments as adopted by the Village of Oak Brook, IL.
B. Install electrical Work in accordance with the NECA Standard of Installation.

1.04 DELIVERY, STORAGE AND HANDLING

A. Store and protect all materials as specified under the provisions of Section 01 60 00 and as specified herein.
B. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.
C. Ship products to the job site in their original packaging. Receive and store products in a suitable manner to prevent damage or deterioration. Keep equipment upright at all times.
D. Investigate the spaces through which equipment must pass to reach its final destination. Coordinate with the manufacturer to arrange delivery at the proper stage of construction and to provide shipping splits where necessary.

1.05 PROJECT/SITE CONDITIONS

A. Install work in locations shown on Drawings, unless prevented by Project conditions. Drawings have omitted certain branch circuitry in areas for ease of reading. All branch circuitry is to be provided by Contractor.
B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission from Architect/Engineer before proceeding as specified under modification procedures.

1.06 QUALITY ASSURANCE

A. Provide Work as required for a complete and operational electrical installation.
B. All products shall be designed, manufactured, and tested in accordance with industry standards. Standards, organizations, and their abbreviations as used hereafter, include the following:
   1. American National Standards Institute, Inc (ANSI).

2. American Society for Testing and Materials (ASTM).
3. National Electrical Manufacturers Association (NEMA).
4. Underwriters Laboratories, Inc. (UL).

C. Install all Work in accordance with the NECA Standard of Installation.

1.07 SUBMITTALS

A. Submit all requested items in Division 26 Sections under provisions of Section 01 30 00.

1.08 PROJECT RECORD DOCUMENTS

A. Cooperate and assist in the preparation of project record documents under the provisions of Section 01 78 00.

1.09 PROJECT MANAGEMENT AND COORDINATION

A. Proper project management and coordination is critical for a successful project. Manage and coordinate the Work with all other trades in accordance with Section 01 30 00 requirements. Reliance on the Drawings and Specifications only for exact project requirements is insufficient for proper coordination.

PART 2 PRODUCTS

2.01 WIRING METHODS

A. All locations: Building wire in raceway.
B. Use no wire smaller than 12 AWG for power and lighting circuits, and no smaller than 14 AWG for control wiring.
   1. Use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 100 feet. Use minimum #10 AWG conductor wire in all the following locations:
      a. All programmable panel branch circuits (larger where indicated).
      b. All emergency lighting and exit branch circuits.

2.02 WIRE AND CABLE

A. Manufacturers:
   1. Okonite.
   2. Southwire.
   3. Collyer.

B. Building Wire:
   1. Feeders and Branch Circuits Larger Than 6 AWG: Copper, stranded conductor, 600 volt insulation.
   2. Feeders and Branch Circuits 6 AWG and Smaller: Copper conductor, 600 volt insulation. 6 and 8 AWG, stranded conductor; smaller than 8 AWG, stranded conductor (solid for device terminations).
   3. Control Circuits: Copper, stranded conductor, 600 volt insulation.
   4. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet.
   5. Use 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 200 feet.
   6. Use conductor not smaller than 12 AWG for power and lighting circuits.
   7. Use conductor not smaller than 16 AWG for control circuits.

C. Locations:

1. Concealed Dry Interior Locations: Use only building wire with Type THHN insulation in raceway.
2. Exposed Dry Interior Locations: Use only building wire with Type THHN insulation in raceway.
3. Above Accessible Ceilings: Use only building wire with Type THHN insulation in raceway.
4. Pool Area, Wet or Damp Interior Locations: Use only building wire with Type THWN insulation in raceway.
5. Exterior Locations: Use only building wire with Type XHHW insulation in raceway.
6. Underground Installations: Use only building wire with Type XHHW insulation in raceway.

2.03 RACEWAY REQUIREMENTS

A. Use only specified raceway in the following locations:
   1. Branch Circuits and Feeders:
      a. Concealed Dry Interior Locations: Electrical metallic tubing.
      b. Exposed Dry Interior Finished Locations: Electrical metallic tubing.
      c. Exposed Dry Interior Unfinished Locations: Electrical metallic tubing.
      d. Pool and Pool Mechanical Room: Galvanized Rigid Conduit.
      e. All other locations: Galvanized Rigid Metallic Conduit.

B. Size raceways for conductor type installed.
   1. Minimum Size Conduit Homerun to Panelboard: 3/4-inch.

2.04 METALLIC CONDUIT AND FITTINGS

A. Conduit:
   1. Rigid Steel Conduit: ANSI C80.1.
   2. Electrical metallic tubing: ANSI C80.3.
   3. Flexible Conduit: UL 1, zinc-coated steel.
      a. Liquidtight Flexible Conduit: UL360. Fittings shall be specifically approved for use with this raceway.

B. Conduit Fittings:
   1. Metal Fittings and Conduit Bodies: NEMA FB 1.
      a. EMT fittings: Use compression type fittings.

2.05 CONDUIT HANGERS

A. Manufacturers:
   1. Minerrallac Electric Company.
   2. Substitutions: Or Approved Equal.

B. Description:
   1. Standard conduit hanger, zinc-plated steel with bolts.
   2. Threaded rod and hardware: Plated finish, size and length as required for loading and conditions.

2.06 BEAM CLAMPS

A. Manufacturers:
   1. Appleton.
   2. Midwest.
   3. Raco.

B. Description: Malleable beam clamp, zinc plated steel.

2.07 ELECTRICAL BOXES

A. Manufacturers:
   1. Raco.
   2. Steel City.
   3. Appleton.
   4. Substitutions: Or Approved Equal.

B. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, galvanized steel, suitable for installation in masonry:
C. Equipment Support Boxes: Rated for weight of equipment supported; include 2 inch male fixture studs where required.
D. Wet Location Outlet Boxes: Cast aluminum: Cast alloy, deep type, gasket cover, threaded hubs.

2.08 PENETRATION SEALANTS

A. Fire-rated assemblies: Provide firestopping of all penetrations made by Work under this Contract.
B. Thermal and Moisture Protection: Provide thermal and moisture protection made by Work under this Contract of all exterior wall, floor and roof penetrations in accordance with Division 7 requirements.

2.09 PULL BOXES

A. Manufacturers:
   1. Hoffman.
   2. Cooper Industries.
   3. Approved Equal.

B. Description:
   1. NEMA Type 1 Lay-In Galvanized Wireway, UL 50 pull box. Flat cover design. Size per NEC requirements.
   2. Provide hinged covers where noted on drawings.
   3. Provide all elbows, tee's, covers and fittings as required

C. Finish:
   1. To be selected by Architect/Engineer.

2.10 NAMEPLATES AND LABELS

A. Nameplates: Engraved three-layer laminated plastic, black letters on white background.
B. Locations:
   1. Each electrical distribution and control equipment enclosure.

C. Letter Size:
   1. Use 1/8 inch letters for identifying individual equipment and loads.
   2. Use 1/4 inch letters for identifying grouped equipment and loads.

D. Labels: Embossed adhesive tape, with 3/16 inch white letters on a black background. Use only for identification of individual wall switches and receptacles and control device stations.

2.11 WIRE AND CABLE MARKERS

A. Manufacturers:

1. Brady Model PCPS.
2. Panduit Model PCM.
3. T & B Model WM.

B. Description: Cloth type wire markers.
C. Locations: Each conductor at panelboard gutters, pull boxes, and each load connection.
D. Legend:
   1. Power and Lighting Circuits: Branch circuit or feeder number indicated on drawings.

2.12 CONDUIT MARKERS

A. Location: Furnish markers for each conduit longer than 6 feet.
B. Spacing: 20 feet on center.
C. Color:
   1. 480 Volt System: Orange
   2. 208 Volt System: Black
   3. Fire Alarm System: Red.

PART 3 EXECUTION

3.01 EXAMINATION AND PREPARATION

A. Demolition Drawings are based on casual field observation and are intended to identify the limits of the construction site. Remove all electrical systems in their entirety in proper sequence with the Work.
B. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
C. Existing Electrical Service and Emergency Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from Owner and Architect at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
D. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Notify Owner, Architect/Engineer and local fire service at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
E. Beginning of demolition means installer accepts existing conditions.
F. Verify that supporting surfaces are ready to receive work.
G. Electrical boxes are shown on Drawings, in approximate locations, unless dimensioned.
   1. Obtain verification from Architect/Engineer for locations of outlets throughout prior to rough-in.

H. Degrease and clean surfaces to receive wire markers.
I. Verify that interior of building is physically protected from weather.
J. Verify that mechanical work which is likely to injure conductors has been completed.
K. Completely and thoroughly swab raceway system before installing conductors.

3.02 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Remove all existing electrical installations to accommodate new construction.
B. Remove abandoned wiring to source of supply.

C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
D. Relocate existing fire alarm devices affected by wall, ceiling and floor demolition.
E. Repair adjacent construction and finishes damaged during demolition and extension work.

3.03 APPLICATION

A. Install nameplate and label parallel to equipment lines.
B. Secure nameplate to equipment front using screws.
C. Secure nameplates to inside surface of door on panelboard that is recessed in finished locations.
D. Identify underground conduits using underground warning tape. Install one tape per trench at 3 inches below finished grade.
E. Neatly train and secure wiring inside boxes, equipment, and panelboards.
F. Use wire pulling lubricant for pulling 4 AWG and larger wires.
G. Route wire and cable as required to meet project conditions.
    1. Wire and cable routing indicated is approximate unless dimensioned.
    2. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.
H. Pull all conductors into raceway at same time.
I. Protect exposed cable from damage.
J. Neatly train and lace wiring inside boxes, equipment and panelboards.
K. Support cables above accessible ceilings to keep them from resting on ceiling tiles.
L. Make splices, taps, and terminations to carry full ampacity of conductors without perceptible temperature rise.
M. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
N. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation".
O. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.
P. Do not use powder-actuated anchors.
Q. Do not drill or cut structural members.
R. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
S. Install surface-mounted cabinets and panelboards with minimum of four anchors.
T. In wet and damp locations use steel channel supports to stand cabinets and panelboards one inch off wall.
U. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.
V. Terminate spare conductors with electrical tape.
W. Do not share neutral conductor on load side of dimmers.

END OF SECTION

SECTION 26 05 83
WIRING CONNECTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical connections to equipment and devices not and integral part of the electrical distribution system.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Provide conduit rough-in and electrical connection to powered equipment and devices identified in the Project Manual and on the Drawings. Refer specifically, but not limited to, these Specification Sections for further information:
   1. Section 28 46 00 - Fire Detection and Alarm.
   2. Section 23 05 33 - Heat Trance
   3. Section 23 75 16 - Custom Outdoor Central-Station Dehumidifier.

B. Coordination: Determine connection locations and requirements for furniture, equipment and devices furnished or provided under other sections.
   1. Do not rely solely on the Drawings and Project Manual for execution of the Work of this Section.
   2. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions.
   3. Include necessary field evaluation time to inspect connection requirements.
   4. Coordinate with other trades to determine exact rough-in requirements.

C. Sequencing:
   1. Install rough-in of electrical connections before installation of furniture and equipment is required.
   2. Make electrical connections before required start-up of equipment.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide wiring device manufacturer’s catalog information showing dimensions, configurations, and construction.
C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.04 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.
B. Products: Listed, classified, and labeled as suitable for the purpose intended.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.02 ELECTRICAL CONNECTIONS

A. Make electrical connections in accordance with equipment manufacturer's instructions.
B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
D. Provide receptacle outlet to accommodate connection with attachment plug.
E. Provide cord and cap where field-supplied attachment plug is required.
F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
H. Install terminal block jumpers to complete equipment wiring requirements.
I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

END OF SECTION

SECTION 26 24 13
SWITCHBOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Low-voltage (600 V and less) switchboards and associated accessories for service and distribution applications.
B. Overcurrent protective devices for switchboards.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for switchboards, enclosures, overcurrent protective devices, and other installed components and accessories.

1.03 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store switchboards in accordance with manufacturer's instructions, NECA 400, and NEMA PB 2.1.
B. Store in a clean, dry space having a uniform temperature to prevent condensation (including outdoor switchboards, which are not weatherproof until completely and properly installed). Where necessary, provide temporary enclosure space heaters or temporary power for permanent factory-installed space heaters.
C. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
D. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Switchboards:
   1. Eaton Corporation; Pow-R-Line: www.eaton.com/#sle.
   2. Schneider Electric; Square D Products; HCN: www.schneider-electric.us/#sle.
   3. Siemens Industry, Inc; SB: www.usa.siemens.com/#sle.

2.02 SWITCHBOARDS

A. Provide switchboards consisting of all required components, control power transformers, instrumentation and control wiring, accessories, etc. as necessary for a complete operating system.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Description: Dead-front switchboard assemblies complying with NEMA PB 2, and listed and labeled as complying with UL 891; ratings, configurations and features as indicated on the drawings.
D. Front-Connected Switchboards:
   1. Feeder Devices: Panel/group-mounted.

2. Arrangement: Front accessible only (not rear accessible), rear aligned.

E. Service Conditions:
   1. Provide switchboards and associated components suitable for operation under the following service conditions without derating:
      a. Altitude: Less than 6,600 feet.
      b. Ambient Temperature:
         1) Switchboards Containing Molded Case or Insulated Case Circuit Breakers: Between 23 degrees F and 104 degrees F.
   2. Provide switchboards and associated components suitable for operation at indicated ratings under the service conditions at the installed location.

F. Short Circuit Current Rating:
   1. Provide switchboards with listed short circuit current rating 35,000 AIC.

G. Main Devices: Configure for top or bottom incoming feed as indicated or as required for the installation. Provide separate pull section and/or top-mounted pullbox as indicated or as required to facilitate installation of incoming feed.

H. Bussing: Sized in accordance with UL 891 temperature rise requirements.
   1. Through bus (horizontal cross bus) to be fully rated through full length of switchboard (non-tapered). Tapered bus is not permitted.
   2. Provide solidly bonded equipment ground bus through full length of switchboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.
   3. Phase and Neutral Bus Material: Aluminum.
   4. Ground Bus Material: Aluminum.

I. Conductor Terminations: Suitable for use with the conductors to be installed.
   1. Line Conductor Terminations:
      a. Main and Neutral Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
      b. Main and Neutral Lug Type: Mechanical.
   2. Load Conductor Terminations:
      a. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
      b. Lug Type:

J. Enclosures:
   1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
      a. Indoor Clean, Dry Locations: Type 1 or Type 2 (drip-proof).
   2. Finish: Manufacturer's standard unless otherwise indicated.

K. Future Provisions:
   1. Prepare designated spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.

L. Instrument Transformers:
   1. Comply with IEEE C57.13.
   2. Select suitable ratio, burden, and accuracy as required for connected devices.
   3. Current Transformers: Connect secondaries to shorting terminal blocks.
   4. Potential Transformers: Include primary and secondary fuses with disconnecting means.

2.03 OVERCURRENT PROTECTIVE DEVICES

A. Circuit Breakers:
   1. Interrupting Capacity:
      a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than specified minimum requirements.
      b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
   2. Molded Case Circuit Breakers:
      a. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers; listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that the ratings and configurations of the switchboards and associated components are consistent with the indicated requirements.
C. Verify that mounting surfaces are ready to receive switchboards.
D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Install switchboards in accordance with NECA 1 (general workmanship), NECA 400, and NEMA PB 2.1.
C. Arrange equipment to provide required clearances and maintenance access, including accommodations for any drawout devices.
D. Where switchboard is indicated to be mounted with inaccessible side against wall, provide minimum clearance of 1/2 inch between switchboard and wall.
E. Provide required support and attachment.
F. Install switchboards plumb and level.
G. Unless otherwise indicated, mount switchboards on properly sized 4 inch high concrete pad constructed.
H. Provide grounding and bonding.
I. Install all field-installed devices, components, and accessories.
J. Where accessories are not self-powered, provide control power source as indicated or as required to complete installation.
K. Provide filler plates to cover unused spaces in switchboards.

3.03 CLEANING

A. Clean dirt and debris from switchboard enclosures and components according to manufacturer's instructions.
B. Repair scratched or marred surfaces to match original factory finish.

END OF SECTION

SECTION 28 46 00
FIRE DETECTION AND ALARM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Modifications to duct detection devices and fan shut down fire safety control function.
B. Replacement and removal of existing fire alarm system components, wiring, and conduit indicated.

1.02 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines current edition.
B. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
C. IEEE C62.41.2 - IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits 2002 (Corrigendum 2012).
D. Provide all materials and labor in conformance with the following codes and standards:
   1. Village of Oak Brook - Code of Ordinances.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Submit all information required for plan review and permitting by authorities having jurisdiction, including but not limited to floor plans, riser diagrams, and description of operation:
   1. Copy (if any) of list of data required by authority having jurisdiction.
   2. NFPA 72 "Record of Completion", filled out to the extent known at the time.
   3. Clear and concise description of operation, with input/output matrix similar to that shown in NFPA 72 Appendix A-7-5-2.2(9), and complete listing of software required.
   4. System zone boundaries and interfaces to fire safety systems.
   5. Location of all components, circuits, and raceways; mark components with identifiers used in control unit programming.
   6. Circuit layouts; number, size, and type of raceways and conductors; conduit fill calculations; spare capacity calculations; notification appliance circuit voltage drop calculations.
   7. List of all devices on each signaling line circuit, with spare capacity indicated.
   8. Manufacturer's detailed data sheet for each component, including wiring diagrams, installation instructions, circuit length limitations, dimensions, ratings, layouts and complete catalog numbers.
      a. Submit UL listings with cross-listing substantiation for each system component clearly marked.
   9. Air-Sampling Smoke Detection Systems: Include air-sampling pipe network layout with sampling ports identified; include calculations demonstrating compliance with specified requirements.
   10. Description of power supplies; if secondary power is by battery include calculations demonstrating adequate battery power.
   11. Certification by either the manufacturer of the control unit or by the manufacturer of each other component that the components are compatible with the control unit.
   12. Certification by the manufacturer of the control unit that the system design complies with Contract Documents.

13. Certification by Contractor that the system design complies with Contract Documents.
14. Do not show existing components to be removed.

C. Evidence of instructor qualifications; training lesson plan outline.
D. Evidence of maintenance contractor qualifications, if different from installer.
E. Inspection and Test Reports:
   1. Submit inspection and test plan prior to closeout demonstration.
   2. Submit documentation of satisfactory inspections and tests.
   3. Submit NFPA 72 "Inspection and Test Form," filled out.

F. Operating and Maintenance Data: See Section 01 78 00 for additional requirements; revise and resubmit until acceptable; have one set available during closeout demonstration:
   1. Complete set of specified design documents, as approved by authority having jurisdiction.
   2. Additional printed set of project record documents and closeout documents, bound or filed in same manuals.
   3. Contact information for firm that will be providing contract maintenance and trouble call-back service.
   4. List of recommended spare parts, tools, and instruments for testing.
   5. Replacement parts list with current prices, and source of supply.
   6. Detailed troubleshooting guide and large scale input/output matrix.
   7. Preventive maintenance, inspection, and testing schedule complying with NFPA 72; provide printed copy and computer format acceptable to Owner.
   8. Detailed but easy to read explanation of procedures to be taken by non-technical administrative personnel in the event of system trouble, when routine testing is being conducted, for fire drills, and when entering into contracts for remodeling.

G. Project Record Documents: See Section 01 78 00 for additional requirements; have one set available during closeout demonstration:
   1. Complete set of floor plans showing actual installed locations of components, conduit, and zones.
   2. "As installed" wiring and schematic diagrams, with final terminal identifications.
   3. "As programmed" operating sequences, including control events by device, updated input/output chart, and voice messages by event.

H. Closeout Documents:
   1. Certification by manufacturer that the system has been installed in compliance with manufacturer's installation requirements, is complete, and is in satisfactory operating condition.
   2. NFPA 72 "Record of Completion", filled out completely and signed by installer and authorized representative of authority having jurisdiction.

1.04 QUALITY ASSURANCE

A. Manufacturer: Qualified company specializing in smoke detection and fire alarm systems with five years documented experience.
B. Installer: Qualified firm with minimum 5 years documented experience installing fire alarm systems of the specified type and providing contract maintenance service as a regular part of their business.
   1. Authorized representative of control unit manufacturer; submit manufacturer's certification that installer is authorized; include name and title of manufacturer's representative making certification.
   2. Installer Personnel: At least 2 years of experience installing fire alarm systems.

3. Supervisor: NICET level III or IV (3 or 4) certified fire alarm technician; furnish name and address.

C. Maintenance Contractor: Same entity as installer or different entity with specified qualifications.
D. Instructor Qualifications: Experienced in technical instruction, understanding fire alarm theory, and able to provide the required training; trained by fire alarm control unit manufacturer.
E. Qualified personnel includes those persons that are:
   1. Factory trained and certified; OR
   2. NICET Level III or IV (3 or 4) Fire Alarm certified; OR
   3. International Municipal Signal Association Fire Alarm certified; OR
   4. Certified by state (Illinois Department of Professional Regulation); OR
   5. Trained, qualified, and employed by an organization listed by a national testing laboratory.

1.05 EXISTING CONDITIONS

A. The existing fire alarm system control panel is a Simplex 4100 Addressible System.
   1. The existing control panel will be modified and expanded to feed new devices as shown on the floor plans.
   2. Owner has reported a trouble condition on this duct detector SLC loop. Contractors shall include new SLC wiring and new duct detectors to eliminate this trouble condition.
   3. Provide new equipment compatible with existing devices and system at site.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FIRE ALARM SYSTEM

A. Fire Alarm System: Provide modifications and extensions to the existing automatic fire detection and alarm system:
   1. Provide all components necessary, regardless of whether shown in Contract Documents or not.
   2. Protected Premises: Areas denoted on the drawings.
   3. Comply with the following; where requirements conflict, order of precedence of requirements is as listed:
      a. ADA Standards.
      b. The requirements of the local authority having jurisdiction which is Village of Oak Brook.
      c. Applicable local codes.
      d. Contract Documents (drawings and specifications).
      e. NFPA 72; where the word "should" is used consider that provision mandatory; where conflicts between requirements require deviation from NFPA 72, identify deviations clearly on design documents.
   4. Evacuation Alarm: Single smoke zone; general evacuation of entire premises.
   5. Zoning: Point addressable system with initiating devices being individually zoned.
   6. Existing Control Panel: Make modifications to the existing panel: Reprogramming for new duct detector point modules and fan shut down relay circuitry.

B. Supervising Stations and Fire Department Connections:
   1. Existing connections to remain.

C. Circuits:

1. Initiating Device Circuits (IDC): Class B, Style A.
2. Signaling Line Circuits (SLC) Within Single Building: Class B, Style 0.5.
3. Notification Appliance Circuits (NAC): Class B, Style W.
4. All cabling shall be plenum rated.

D. Power Sources:
1. Primary: Dedicated branch circuits of the facility power distribution system.
2. Secondary: Storage batteries.
3. Capacity: Sufficient to operate entire system for period specified by NFPA 72.
4. Each Computer System: Provide uninterruptible power supply (UPS).

2.03 EXISTING COMPONENTS

A. Existing Fire Alarm System: Remove existing components indicated and incorporate remaining components into new system, under warranty as if they were new; do not take existing portions of system out of service until new portions are fully operational, tested, and connected to existing system.
B. Clearly label components that are "Not In Service."
C. Remove unused existing components and materials from site and dispose of properly.

2.04 FIRE SAFETY SYSTEMS INTERFACES

A. Supervision: Provide supervisory signals in accordance with NFPA 72 for the following:
1. Sprinkler water control valves.

B. Alarm: Provide alarm initiation in accordance with NFPA 72 for the following:
1. Sprinkler water flow.
2. Duct smoke detectors.

C. HVAC:
1. Duct Smoke Detectors: Close dampers indicated; shut down air handlers indicated.

2.05 COMPONENTS

A. General:
1. Provide flush mounted units where installed in finish areas; in unfinished areas, surface mounted unit are acceptable.
2. Provide legible, permanent labels for each control device, using identification used in operation and maintenance data.

B. Initiating Devices:
1. Manual Pull Stations: Double action station, red finish. Addressable/Analog.
a. Provide 1 extra.
2. Duct Mounted Smoke Detector: Addressable/Analog photoelectric type, duct sampling tubes extending width of duct, in duct-mounted housing compatible with control panel and air stream velocities. Fan control shall not be hard wired through duct detector. Fan shutdown shall be completed by fan shutdown relay.
3.

C. Notification Appliances:
D. Zone Module Interface:

1. Single zone interface module shall provide an addressable input interface to the control panel for monitoring normally open contact devices. Mount inside NEMA 1 enclosure within 10 feet of first monitored device of zone. Compatible with control panel.

E. Control Relay Module:
   1. Programmable control relay shall be located within 10' of device to be controlled. Temporal sound pattern. Audio shall be synchronized.

F. Circuit Conductors: Copper or optical fiber; provide 200 feet extra; color code and label.
G. Surge Protection: In accordance with IEEE C62.41.2 category B combination waveform and NFPA 70; except for optical fiber conductors.
   1. Signaling Line Circuits: Provide surge protection at each point where circuit exits or enters a building, rated to protect applicable equipment.

H. Locks and Keys: Deliver keys to Owner.

PART 3 EXECUTION

3.01 EXAMINATION AND PREPARATION

A. Field inspect existing fire alarm system installation to determine all required interface components necessary for fire alarm system replacement and relocation.
B. Perform repair work on existing system to eliminate trouble conditions.

3.02 INSTALLATION

A. Install in accordance with applicable codes, NFPA 72, NFPA 70, and Contract Documents.
B. Install fire alarm system in accordance with manufacturer's instructions.
C. Conceal all wiring, conduit, boxes, and supports where installed in finished areas.
D. Obtain Owner's approval of locations of devices, before installation.
E. Install instruction cards and labels.

END OF SECTION