ADDENDUM NO. 2
JANUARY 9, 2025
FOR
ROOSEVELT PARK POOL EQUIPMENT UPGRADES
MINOT PARK DISTRICT
MINOT, ND
DECEMBER 2024

This Addendum No. 2 forms a part of the Project Manual and modifies the original Bidding Documents as noted within this Addendum. All provisions of the Project Manual not in conflict with this Addendum shall remain in full force. Acknowledge receipt of this Addendum on the outside of the bid envelope and in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This addendum consists of six (6) pages and five (5) attachments.

GENERAL CLARIFICATIONS

Minot Park District Address Clarification

Minot Park District (mailing address)
PO Box 538
Minot, ND **58702**

Minot Park District (physical address/delivery service address)
420 3rd Ave SW
Minot, ND **58701**

Mandatory Pre-Bid Conference Attendance Roster

1) Included as an attachment to this Addendum.

SPECIFICATIONS

Section 01 78 23 – Operation and Maintenance Data -

1) **ADD** Specification 01 78 23 – Operation and Maintenance Data ADD#2

Section 07 41 13 – Metal Roof Panels -

1) Article 2.03.B.1.B **ADD** 26 gage as the base metal thickness.
2) Article 2.07.B **REPLACE epoxy** primer with **manufacturer's standard** primer.

Section 08 80 00 – Glazing -

1) **ADD** Specification 08 80 00 – Glazing ADD#2

Section 09 91 23 – Interior Painting-

1) **REVISE** Article 1.01.A.2 :

   2. Miscellaneous exposed steel surfaces of new construction including guardrails, floor angles, lift beams and support columns.

2) **ADD** article 1.01.A.3:

   3. Hollow metal door and window frames.

Section 13 11 50 – Pool Filtration Equipment -

1) **ADD** Specification 13 11 50 – Pool Filtration Equipment ADD#2

Section 13 11 60 – Pool Chemical Treatment Equipment -

1) **ADD** Specification 13 11 60 – Pool Chemical Treatment Equipment ADD#2

DRAWINGS

Sheet P301

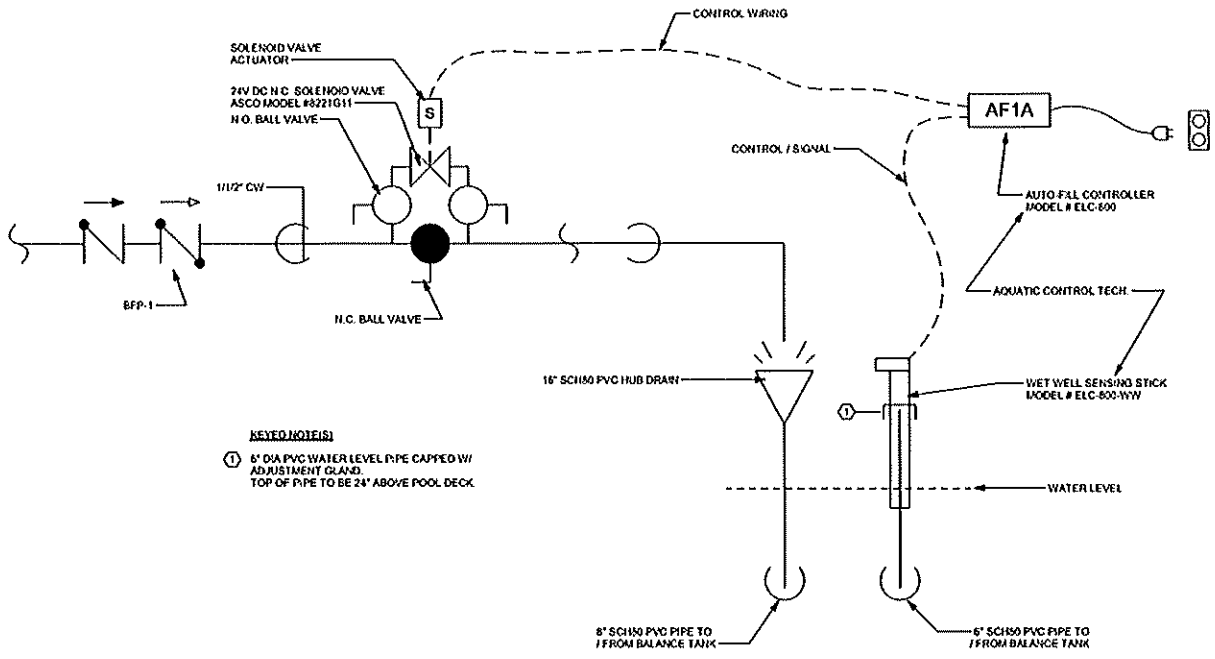
1) Note #9: **Revise** note to read, "See Detail 5/P501".

Sheet P201

1) **ADD** Note #8 to read, "Provide BECS Technology Model # BECSYS5 Automatic Chemistry pH/Acid Feed System Controller (C1A) with required sensors and wiring."

Sheet P501

1) **ADD** Pool Water Level Controller Detail 5/P501.



5 / P501 **POOL WATER LEVEL CONTROLLER DETAIL**
SCALE: NONE

General Electrical Changes

1) The following entry shall be added to the Cable & Conduit Schedule

D	1	3/4"		CONTROL	-	-	2	I/C	#14	-	-	VFD-1	FM1A FLOW METER	TYPE P1

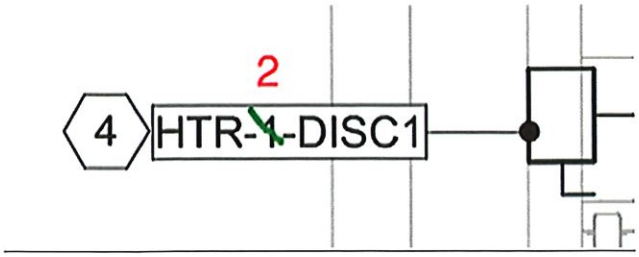
2) The following entries shall replace all previous Cable & Conduit for HTR-1 and HTR-2

HTR-1	A	1	3/4"		120	1	1	1	1/C	#12	#12	#12	PANEL LP-2	HTR-1 (CONTROL PANEL)	TYPE P1
	B	1	3/4"		120	1	1	1	1/C	#12	#12	#12	PANEL LP-2	HTR-1-DISC1	TYPE P1
	C	1	3/4"		120	1	1	1	1/C	#12	#12	#12	HTR-1-DISC1	HTR-1 (CIRC PUMP)	TYPE P1
	D	1	3/4"		MANUFACTURER CABLE								HTR-1-EPO1	HTR-1	TYPE P1
HTR-2	A	1	3/4"		120	1	1	1	1/C	#12	#12	#12	PANEL LP-2	HTR-2 (CONTROL PANEL)	TYPE P1
	B	1	3/4"		120	1	1	1	1/C	#12	#12	#12	PANEL LP-2	HTR-2-DISC1	TYPE P1
	C	1	3/4"		120	1	1	1	1/C	#12	#12	#12	HTR-2-DISC1	HTR-2 (CIRC PUMP)	TYPE P1

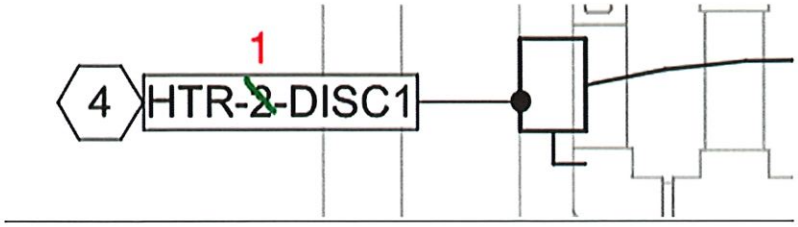
3) Provide a 120V, 15A receptacle dedicated to the C1A chemical controller. Controller and receptacle shall be located near the CHL-1 and PHAS-1 special purpose receptacles.

Sheet E103/104

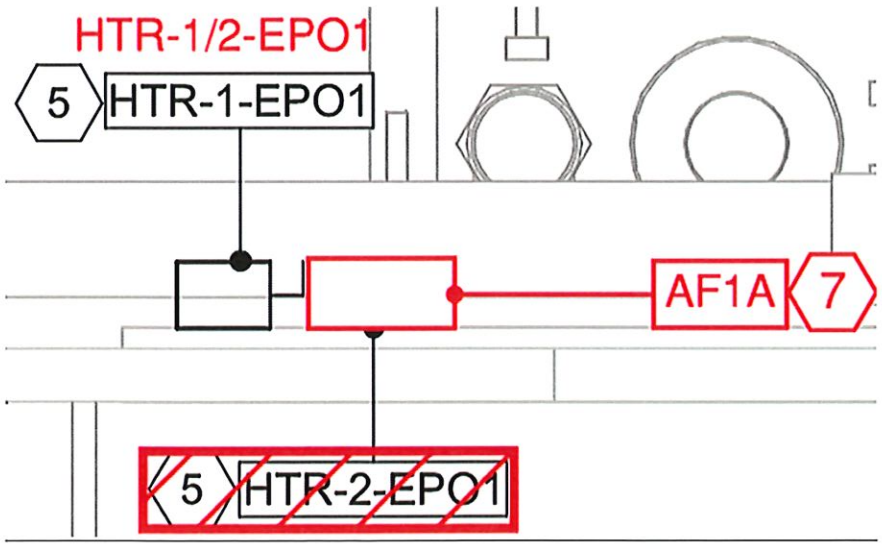
1)__Tag "HTR-1-DISC1" shall be changed to "HTR-2-DISC1"

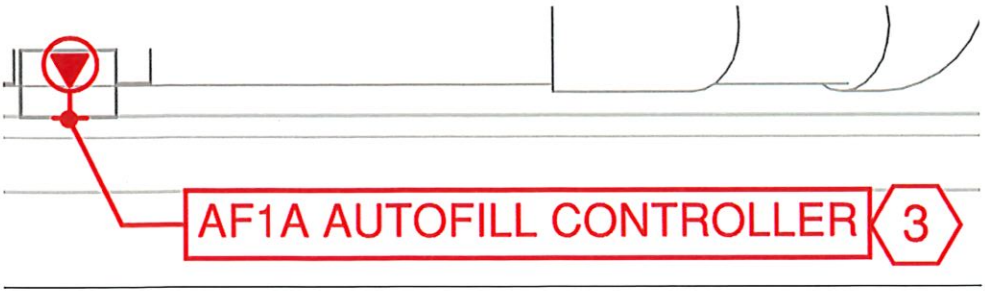


2) Tag "HTR-2-DISC1" shall be changed to "HTR-1-DISC1"

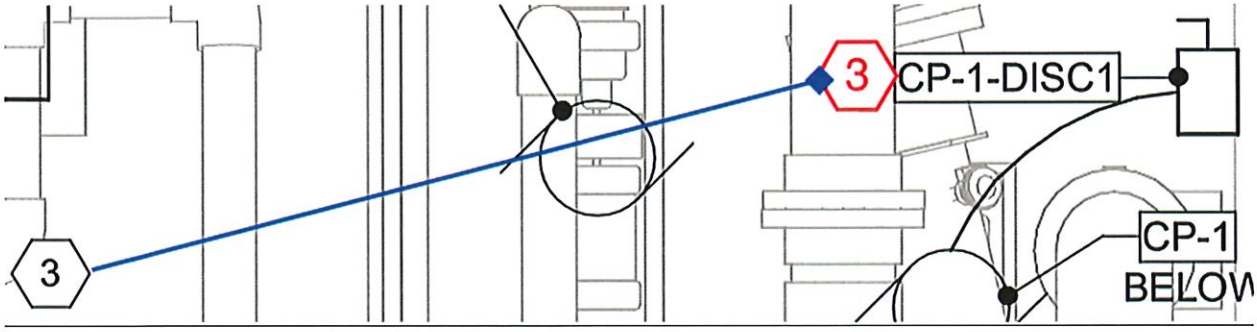


3) "HTR-2-EPO1" shall be removed entirely. "HTR-1-EPO1" may stop both heater units. "HTR-1-EPO1" shall be changed to "HTR-1/2-EPO1". AF1A and its dedicated receptacle will directly replace HTR-2-EPO1.





4) The construction note #3 symbol centered within the floorplan applies to "CP-1-DISC1".



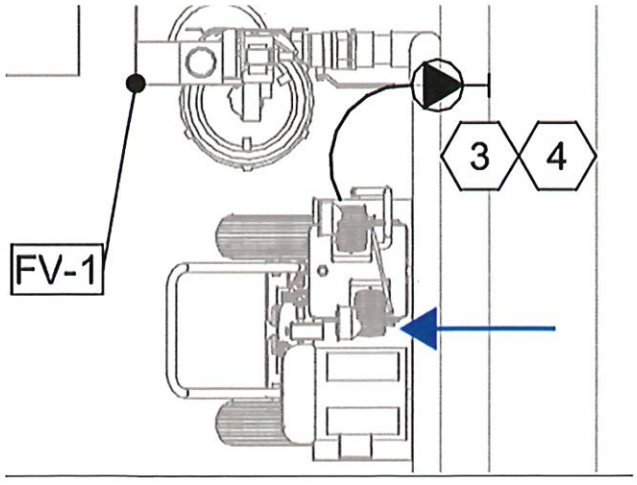
5) Construction note #3 shall not apply to "AC-1", "PHAS-1", or "CHL-1"

6) Construction note #2: the text "BY DIVISION 13 10 00." shall be changed to "BY DIVISION 13."

7) Construction note #3: the text "OR RAILING" and "NEAR LADDER AND" shall be removed entirely.

8) Construction note #5: the text "PROVIDED WITH POOL HEATER BOILER." shall be removed entirely.

9) The terms/tags "AC-1" and "AIR COMPRESSOR" as they appear within electrical sheets refer to the same equipment which is located between the filter unit and filter vacuum unit.



PRIOR APPROVALS

1) None

ATTACHMENT LIST TO THIS ADDENDUM

1) Mandatory Pre-Bid Conference Attendance Roster
2) 01 78 23 Operation and Maintenance Data ADD #2
3) 08 80 00 Glazing ADD #2
4) 13 11 50 Pool Filtration Equipment ADD #2
5) 13 11 60 Pool Chemical Treatment Equipment ADD #2

End of Addendum No. 2

MANDATORY PRE-BID CONFERENCE
ATTENDANCE ROSTER

Minot Park District
Roosevelt Park Pool Equipment Upgrades

PRE-BID MEETING: Monday, January 6, 2025 at 1:00 PM CST

BID DATE: Thursday, January 16, 2025 at 2:00 PM CST

Name	Company	Address	Telephone #
Jarrod Olson	Minot Park District	420 3rd Ave SW Minot, ND 58701	701-857-4136
Jay Kleven	AE2S, LLC	4050 Garden View Dr, Ste 200 Grand Forks, ND 58201	701-746-8087
Savana Barbie	AE2S, LLC	4050 Garden View Dr, Ste 200 Grand Forks, ND 58201	701-746-8087
Cody Bartholomew	AE2S, LLC	4050 Garden View Dr, Ste 200 Grand Forks, ND 58201	701-746-8087
Kami Emineth	AE2S, LLC	1815 Schafer St, Ste 301 Bismarck, ND 58501	701-221-0530
Gabe Hagerott	AE2S, LLC	4170 28th Avenue S. Fargo, ND 58104	701-364-9111
Dave Abrahamson	Fed Serve, LLC	5012 2nd St E West Fargo, ND 58078	701-721-1369
Emmanuel M Minde	Global Specialty Contractors, Inc	3220 Terminal Drive Eagan MN 55121.	651-406-8232
Boyd Rakness	Main & Holmes Electric	2626 Valley St Minot ND 58701	701-852-4445
Hunter Volk	Associated Pool Builders, Inc	2121 Lovett Ave Bismarck ND 58504	701-258-6012
Josh Boling	Burlington Electric	PO Box 127 Burlington, ND 58722	701-509-7363
Lucas Bergeson	Lunseth Plumbing & Heating	1710 North Washington Street Grand Forks, ND 58203	701-772-6631
Ashley Marchant	Rolac Contracting	PO Box 1872 Minot, ND 58702	701-839-6525
Lucas Brown	DLC Construction	PO Box 370 Minot, ND 58702	701-729-8481

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 78 23 – OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
1. Submittal Procedure.
2. General Requirements.
3. O&M Manual Contents.
4. Hard Copy O&M Manuals.
5. Electronic O&M Manuals.
6. Warranty.

1.02 QUALITY ASSURANCE

A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 SUBMITTAL PROCEDURE

A. Submit proposed formats and outlines of O&M manual contents to Engineer in electronic format prior to preparing draft O&Ms. Engineer will review draft format and outlines and return an electronic copy with review comments.
1. For equipment, systems, or component parts of equipment or systems put into service during construction and operated by Owner, submit draft documents within 15 days after start-up and acceptance.

B. Submit one (1) hard copy and electronic copies of draft O&M manual volumes 15 working days prior to Substantial Completion. Engineer will review and return an electronic copy with review comments. Revise O&M manual documents as required prior to final submission.

C. Submit a minimum of two (2) complete hard copies and four (4) flash drives each containing a complete and comprehensive set of final O&M manual documents 10 working days prior to Final Completion.

1.04 GENERAL O&M MANUAL REQUIREMENTS

A. Adequate O&M information shall be supplied for all equipment and systems requiring maintenance or other attention. The respective equipment Supplier shall prepare and provide an O&M manual for each piece of equipment or system indicated in equipment schedules, as specified in Specification Sections, and/or as provided for the Project.

B. O&M Manuals are to contain only that information which applies to the equipment or system provided. Instructions, drawings, schematics, wiring diagrams, parts lists, and other materials which contain information such as optional accessories, alternate equipment arrangements, other equipment series, or other equipment models which are not being provided for the Project may be included only if the

Contractor or Supplier neatly lines out or crosses out extraneous information. Arrows which identify specific items of equipment, systems, or referenced items shall be made by stamp or be of drafting quality and digitally provided using annotation software. Hand-drawn arrows are not acceptable.

C. Unnecessary information, advertising, and theoretical data not directly pertaining to the equipment being supplied shall not be included.

D. Standard catalogs may be included only if the Contractor or Supplier neatly lines out or crosses out information such as optional accessories, alternate equipment arrangements, other equipment series or other equipment models which are not being provided for the Project. Individual catalog sheets, which otherwise meet the requirements of this section, are acceptable.

E. Service manuals shall contain complete and detailed operating, maintenance and repair instructions in sufficient detail to allow journeyman mechanics and Owner's facility operators to adjust, operate, maintain, and repair all components of the equipment, and to order all parts without consultation with the manufacturer or his representative.

F. The O&M manuals shall be in addition to any instructions or parts lists packed with or attached to the equipment when delivered, or which may be required by Contractor for installation purposes.

G. Shipment of equipment will not be considered complete until all required O&M manuals and data have been received.

H. Do not use Project Record Documents as maintenance drawings.

1.05 OPERATION AND MAINTENANCE MANUAL CONTENTS

A. This section describes the required organization of the O&M Manuals. If sections or subsections of this outline are not applicable to a specific equipment or system item, the designation "Not Applicable" shall be placed next to the heading in the Table of Contents and at the location of the Section in the manual itself.

B. Part 1 – "General Information"
   1. Shall include all general instructions, a description of the equipment or system and how it functions, and shall provide all information necessary for identification and normal operation.
   2. Include the following information as a minimum:
      a. Equipment pre-startup, startup, and normal operating instructions.
      b. Sequence of operation.
      c. Shutdown and emergency shutdown instructions.
      d. Control diagrams, modified to reflect the as-built, as-installed condition.
   3. This section shall also include general assembly drawings, sections, and photographic views as necessary to completely depict and properly identify the equipment or system. The material provided shall indicate dimensions, weight, capacity, and design conditions for the equipment or system.

C. Part 2 – “Detailed Installation, Maintenance, Calibration, and Repair Information”

1. Shall contain detailed information, drawings, procedures, and guides to allow for the proper installation, safety, lubrication, statistical information (calibration, testing), preventative maintenance (PM), and corrective maintenance (CM) procedures.
2. The **Installation subsection** shall contain all the drawings or schematics necessary to properly assemble and install the equipment including alignment, clearances, tolerances, and interfacing equipment requirements. It shall denote by trade the skill level required to install the equipment, any special rigging required to place the equipment in place, and any special test equipment required to place the equipment in service.
3. The **Safety subsection** shall address all safety and tag-out procedures necessary to safely operate and maintain the equipment or system.
4. The **Lubrication subsection** shall contain information required to address all lubrication points, reservoirs, or locations which require periodic lubrication or fluids maintenance. All lubrication points, reservoirs, or related locations shall be identified on a separate drawing referencing a lubrication chart.
5. The **Statistical Information subsection** shall contain information from the original equipment manufacturer as to performance such as pump curves, flow charts, insulation resistance, calibration, or test data sheets, etc. This subsection shall also contain actual denoting test method, test equipment used, and the procedure used. The Contractor shall submit startup and testing forms for Engineer’s review and comment.
6. The **Preventative Maintenance (PM) subsection** shall include PM tasking for equipment inspection, testing, routine adjustments, and lubrication, and shall address work at the component level (e.g., motor, drive, gearbox, etc.). This subsection shall also include:
    a. Trade(s) i.e., electrical, mechanical, instrumentation, etc.;
    b. Skill levels required, i.e., apprentice, journeyman, master, etc.;
    c. Anticipated total time required to perform the PM work;
    d. Number of personnel required to safely perform the PM work;
    e. Frequency that work is to be performed;
    f. Drawing(s) references;
    g. Service manual references.
7. PM tasking shall be developed for the following types of efforts:
    a. Multiples of equipment identified with identical task, parts, trade, frequency, etc., assigned to the lowest level repetitive task at the same relative location;
    b. Individual components;
    c. All components within an equipment system or process unit;
    d. Seasonal work which is not performed at a set frequency.
8. PM tasking shall address all levels of effort ranging from daily/weekly inspections performed by operations personnel through routine PMs scheduled weekly, monthly, quarterly, semi-annually or annually through major overhauls by maintenance personnel. Include predictive maintenance work which will include testing analysis of the equipment such as vibration, flow, oil sampling, meggering, alignment, lubrication, etc.

9. PM information shall be presented in tabular form.
10. The **Corrective Maintenance (CM) subsection** shall include detailed and complete disassembly and assembly information for all equipment, and shall be covered by cross-sectional drawings or exploded views with all parts numbered to correspond with the numbers in the parts list to permit identification of the various parts. A table of normal clearances, diameters, thicknesses of new parts, and limits permissible for wearing parts shall be included. Torque settings for nuts, bolts, and fasteners shall be provided as required.
11. All internal test points and maintenance checks of each piece of equipment and/or device shall be shown on drawings and diagrams, and referenced to the maintenance procedures and testing portion of the manual.

D. Part 3 – "Diagrams and Schematics"
1. Shall cover all necessary equipment drawings, diagrammatic piping and wiring diagrams, instrumentation and control diagrams and schematics, and miscellaneous necessary drawings and equipment. Lettering shall be typed or printed; hand lettering is not acceptable.
2. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communication descriptions. Information shall be typed or printed; hand lettering/writing is not acceptable. Refer to applicable Division 26 Specification Sections.
3. Include color coded wiring diagrams as installed. Refer to applicable Division 26 Specification Sections.
4. Provide Contractor's coordination drawings with color coded piping diagrams as installed.
5. Provide charts of valve tag numbers, with location and function of each valve, keyed to process flow, instrumentation, and control diagrams.

E. Part 4 – "Warranties and Guaranties"
1. Shall include all of Contractor's warranty information for all Project components in tabular form.
2. Shall include all effective warranty dates for all installed equipment and systems.
3. Warranties: Prepare and submit per Section 01 77 00 – Closeout Procedures.

F. Part 5 – "Spare Parts"
1. Section requires the development of a table that includes a complete list of parts, with a cross-reference to other manufacturer(s) or supplier(s) of the same type of interchangeable component or product included along with their original manufacturer's part numbers. The parts list shall be complete, and described so that parts may be readily identified and ordered. Each part shall be identified by the manufacturer's part number and cross referenced to the OEM part number specified equipment number.
2. The unit of issue (quantity) and price (at the time of installation) shall be listed for each part.

3. Recommended spare parts listing and frequency of replacement for all wearing components shall be identified in the table. The table shall include part numbers, frequency of replacement on a running time, calendar and/or seasonal basis as applicable and shall be annotated with the manufacturer's anticipated useful life expectancy of the unit expressed in running time and calendar years. A listing of gaskets or any other items which may be required to perform a complete and satisfactory replacement and/or overhaul shall be included with the replacement parts list.
4. As a function of the PM and CM, the stock level requirements for spare parts shall be quantified. The spare parts listing shall be developed from the PM schedule requirements and the manufacturer's spare parts recommendations. A list within the table shall be developed for assigning maximum and minimum stocking levels.
5. A listing in the table shall identify recommended emergency reserve parts, components, and whole equipment units and their extended cost. A cross reference to separate manuals or manual sections covering interfaced equipment shall also be included. In those cases where an equipment or device interface is shown, this information, for verification of the functional requirement of that device or equipment, shall be shown on drawings, diagrams, and schematics.

G. Part 6 – "Field Testing Records"
1. Shall be set aside for the insertion of all field testing records for the individual equipment field testing. This information shall be submitted with the appropriate unit ID and service manual numbers on each sheet of the test data.
2. For all service manuals submitted for field assembled equipment such as electrical systems (e.g., MCCs, switchgear, and control panels) and control instrumentation, as-built drawings shall be submitted by the Contractor whenever the equipment as finally installed differs from the manner in which it was depicted in earlier submittals. These drawings shall be in the same format as the original submittals and shall be suitable for insertion into the service manuals as replacement drawings.

1.06 HARD COPY OPERATION AND MAINTENANCE MANUALS

A. Contractor shall prepare data in the form of an instructional manual.

B. Binders:
1. Commercial quality, 8-1/2 x 11 inch three D side ring binders with durable plastic covers.
2. 2-inch maximum ring size.
3. When multiple binders are used, correlate data into related consistent groupings and arrange in volumes with logical/intuitive breaks.

C. Cover; Identify:
1. Each binder with typed title OPERATION AND MAINTENANCE INSTRUCTIONS.
2. Title of Project.
3. Year of construction.

4. Subject matter of contents.
5. Volume number.
6. Date prepared.

D. Table of Contents:
1. Provide an overall Table of Contents in each volume.
2. Coordinate entire contents into tabbed dividers. Label tabs accordingly to coincide with Table of Contents.

E. Provide tabbed dividers for each respective product, piece of equipment, and/or system. Provide with typed descriptions of products, equipment, and systems, detailed operation explanations tailored to the Project, detailed maintenance explanation(s) and descriptions, and descriptions of major components, parts, and equipment.

F. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages. Folded paper should be unfoldable without removal from binder.

1.07 ELECTRONIC OPERATION AND MAINTENANCE MANUALS

A. Electronic O&M manuals provided by Contractor:
1. Manuals shall be created in Adobe Acrobat electronic portable document format (PDF), latest version.
2. Manuals shall be viewable and searchable on flash drive, contain a book-marked Table of Contents, and be fully indexed with thumbnails generated and all pages in proper orientation.
3. Electronic manual layout shall be identical to hard copy and follow same Table of Contents.
4. The final electronic O&M Manual shall include direct links accessing all equipment within the complete O&M Manual.
5. Drawings shall be of true scale (where applicable) and in PDF format.

B. Electronic Document shall be optimized for Web publishing and shall support both satisfactory on-screen viewing and print quality. Electronic Document features shall include the following:
1. An electronic Table of Contents.
2. A printable Table of Contents and printable index in addition to any electronic indexing functions.
3. A “How to Use This Electronic Document” preface section.
4. Document shall open and display Bookmarks to the side of the document.
5. Documents shall be broken out into small usable files.
6. All files to be viewed shall be oriented so that text rotation is not required.
7. Contractor shall be fully responsible for obtaining any and all Copyright permissions associated with the conversion of this information to electronic PDF.

1.08 INSTRUCTION OF OWNER PERSONNEL

A. Before Substantial Completion, instruct Owner's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times. Refer to Section 01 75 00 Starting and Adjusting, 01 77 00 Closeout Procedures, and Section 01 79 00 Demonstration and Training.

B. For equipment requiring seasonal operation, perform instructions for other seasons within six months.

C. Use O&M manuals as basis for instruction. Review contents of manuals with personnel in detail to explain all aspects of O&M.

D. Prepare and insert additional data in O&M Manual when need for additional data is requested by Owner or Engineer or becomes apparent during review and instruction.

1.09 WARRANTY

A. Contractor shall provide a twelve-month warranty on all electronic documents that covers the following items:
   1. Re-processing or configuration of any portion of the electronic document that does not view or print to the Owner's satisfaction.
   2. Modifying index or re-sizing files in the event Owner or Engineer deem document access unsatisfactory.
   3. Updating the Electronic Document for any missing reference materials.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 08 80 00
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glazing units.

B. Glass coatings.

C. Glazing compounds.

1.02 RELATED REQUIREMENTS

A. Section 08 51 23 - Steel Windows: Window frames.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).

C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

E. ASTM C1036 - Standard Specification for Flat Glass; 2021.

F. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.

G. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2019.

H. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).

I. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.

J. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers; 2000 (Reapproved 2020).

K. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting; 2018.

L. ASTM D1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics; 2021.

M. ASTM E903 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres; 2020.

N. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.

O. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2023.

P. GANA (GM) - GANA Glazing Manual; 2022.

Q. GANA (SM) - GANA Sealant Manual; 2008.

R. GANA (LGRM) - Laminated Glazing Reference Manual; 2019.

S. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (Reaffirmed 2016).

T. ISO 527-3 - Plastics - Determination of Tensile Properties - Part 3: Test Conditions for Films and Sheets; 2018.

U. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.

V. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.

W. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2023.

1.04 SUBMITTALS

A. See Section 01 13 00 - Submittals for submittal procedures.

B. Product Data on Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods.

1.06 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 40 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.

1. Design Pressure:
   a. Positive Design Pressure: 40 psf.
   b. Negative Design Pressure: 40 psf.
2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
3. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
4. Glass thicknesses listed are minimum.

B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.

1. In conjunction with weather barrier related materials described in other sections, as follows:

C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:

1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
3. Solar Optical Properties: Comply with NFRC 300 test method.

2.02 GLASS MATERIALS

A. Laminated Glass: Float glass laminated in accordance with ASTM C1172.

1. Laminated Safety Glass: Complies with ANSI Z97.1 - Class B or 16 CFR 1201 - Category I impact test requirements.
2. Polyvinyl Butyral (PVB) Interlayer: 0.030 inch thick, minimum.

2.03 GLAZING UNITS

A. Type G-3 - Monolithic Safety Glazing: Non-fire-rated.

1. Applications:
   a. Exterior window..
2. Glass Type: Laminated safety safety glass as specified.
3. Tint: Gray.

4. Thickness: 1/4 inch, nominal.
5. Glazing Method: Dry glazing method, gasket glazing.

2.04 LAMINATED GLASS INTERLAYERS

A. Type LGI-1 - Polyvinyl Butyral (PVB) Interlayer for Laminated Glazing:

1. Functionality: Post-breakage safety and security.
2. Applications:
3. Color: Clear.
4. Thickness: 0.030 inch, 30 mils, nominal.

2.05 GLASS COATINGS

A. Protective Glass Coatings: Transparent coatings used to seal and protect surface of glass subject to wear, soiling, and degradation from environmental exposure.

1. Application: Exterior glazing.
   a. Factory apply coating as part of glass pane fabrication process.

2.06 GLAZING COMPOUNDS

A. Type GC-5 - Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; nonbleeding, nonstaining; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; _____ color.

2.07 ACCESSORIES

A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.

B. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.

B. Verify that the minimum required face and edge clearances are being provided.

C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

D. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

A. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

B. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.

C. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, and paint.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.

B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 CLEANING

A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.

B. Remove nonpermanent labels immediately after glazing installation is complete.

C. Clean glass and adjacent surfaces after sealants are fully cured.

D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION 08 80 00

SECTION 13 11 50
POOL FILTRATION EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Furnishing, installation, and testing of the following, as indicated, in accordance with the provision of the Contract Documents:
   a. Filter System including remote-mounted control panel and media vacuum system, custom pre-coat tee and strainer

B. Related Sections include:

1. Division 1 - General Requirements.
2. Division 13 - Special Construction.
3. Division 26 – Electrical.

1.02 GENERAL

A. All electrical, mechanical, metal, painting, and instrumentation work included herein shall conform to the applicable Sections or Divisions of the Contract Documents.

B. Power shall be provided by the Contractor to the Filter System control panels as shown on the Drawings. The Contractor shall be responsible for providing all necessary conduit and wiring necessary for complete electrical service to the specified location.

C. Wiring between components shall be provided by the Contractor in accordance with the Drawings and Specifications.

D. The Drawings show details of the Filter System components and their overall relationships. Not all items incidental to the Filter System are shown or specified. It is the intent of this Section that the Filter System Supplier is to provide a complete and operational system whether or not any specific and/or required system component is shown or specified herein.

E. Contractor and Filter System Supplier shall verify existing installation dimensions prior to shipping the Filter equipment. The filter tank may need to be tipped horizontally in order to be moved through existing building doors and to the final installation location.

F. The Contractor shall provide and install the Filter System in accordance with approved submittal drawings. The Filter System Supplier shall inspect the installation of the Filter System, and the Contractor shall correct any deficiencies identified.

G. The Filter System Supplier shall be responsible for programming the Filter System control panel software and shall assist Engineer with assuring Filter

System communicates with associated pool chemical control systems.

H. The Filter System Supplier shall perform functional and start-up testing of the Filter System.

1.03 SYSTEM DESCRIPTION

A. The Filter System from pump through precoat system, including all filter control valves as hereinafter specified and all accessories, shall be supplied and guaranteed by one manufacturer. Any filter offered under these specifications shall be certified NSF 50 at time of offering. The Filter System Supplier shall furnish the following equiment components for a Regenerative Filter System.

1. Filter Tank
2. Flex-Tubes and Assembly
3. Bump Mechanism
4. Filter Media
5. Controls and Gauge Assembly
6. Filter Assembly
7. Filter Piping and Valves
8. Filter Precaution
9. Automatic Filter Controller
10. Pneumatic Control System
11. Control Panel
12. Vacuum Transfer Pump
13. Drain Booster Pump
14. Strainer with Integral Reducing Precoat Tee
15. Air Compressor
16. Air Line

B. The Contractor furnish the following equiment components for a Regenerative Filter System.

1. Flow Meter
2. VFD

1.04 SUBMITTALS

A. Shop Drawings and Product Data shall be submitted in accordance with specification Section 01 13 00 - Submittals and shall include detailed specifications, drawings, and data covering the following information and all materials, parts, devices, equipment, dimensions, components, properties, and other accessories forming part of equipment for the complete operational system.

1. Descriptive literature, bulletins, and catalogs, manufacturing, fabrication, and installation detail sheets for filter equipment, strainer assembly, compressed air system, and other related appurtenances.
2. Materials of construction for all major components, including fasteners.
3. Elevation and plan views of all components and assemblies showing configuration, construction, dimensions, and fastening details.
4. Installation and leveling data.

5. Provide Engineer with sequence of operations and system control adjustments.
6. Details submitted shall include as a minimum: plans, sections, and details of equipment components and connections.
7. Testing Procedures: Detailed start-up, hydraulic, and testing procedures.

B. Furnish Manufacturer's field service reports under provisions of Section 01 13 00, reports covering start up, adjusting, commissioning, demonstration, and training.

C. Submit operation and maintenance manuals and Manufacturer's instructions in accordance with Sections 01 13 00 and 01 78 23.

D. Equipment shall not be fabricated until manufacturer receives written approval of submitted information.

1.05 QUALITY ASSURANCE

A. The equipment and material to be furnished under this Contract shall be in accordance with Section 01 45 00 Quality Controls and Section 01 61 00 Common Product Requirements.

B. Filter System Supplier Qualifications – The Filter System Supplier shall have experience in furnishing equipment of similar capacity and service capability to the equipment specified herein. As part of the submittal package, the Filter System Supplier shall submit the following to verify qualifications:

1. Evidence that equipment of similar capacity and service capability has been in successful operation in at least five (5) separate installations within the continental United States.
2. Current NSF Standard 50 (NSF-50) Certification for the Filter System being offered.

C. Factory Testing:

1. The Filter System shall be factory tested prior to shipment, and then shipped assembled. The tests shall include plumbed assemblies, control panel functionality, and general system wiring verifications as outlined below. A copy of test results shall be certified and included in the equipment shipment.
   a. Plumbed Assemblies:
      1) Visual inspection of general workmanship.
      2) Visual verification that the arrangement and dimensions of the assembly are consistent with the Drawings.
      3) Visual verification of nameplate information.
      4) Hydrostatic test all filter mounted components.
   b. Control Panel:
      1) Visual inspection of general workmanship.
      2) Visual verification that the control panel layout is consistent with the layout and schematic Drawings.
      3) Visual verification of nameplate information.
      4) Simulation of inputs/outputs to verify correct wiring and correct software functionality.
      5) Continuity test to verify wiring.

6) Confirm and document all system alarms and faults.

1.06 FIELD CONDITIONS

A. Existing Conditions: The filtration system is wholly installed within an existing wood-framed equipment shed. The filter tank, main suction pump, drain pump, strainer, precoat tee are mounted in an existing below grade pit..

1.07 WARRANTY REQUIREMENTS

A. A written warranty shall be provided for the equipment specified in this Section. The warranty shall be for a minimum period identified herein and shall begin from the date of Substantial Completion, as defined in Section 01 77 00 Closeout Procedures. Such warranty shall cover all defects or failures of materials or workmanship that occur as the result of normal operation and service. No prorated warranty will be accepted.

1. Contractor's Warranty: Two (2) Year.
2. Manufacturer's Warranty: Minimum of one (2) years but not less than manufacturer's standard warranty period.

PART 2 PRODUCTS

2.01 GENERAL

A. The Drawings have been prepared based on the Paddock equipment scheduled on the project plans. If any other manufacturers are approved, variation in design may result in variations in pipe sizes and equipment orientation. Contractor shall assume all responsibility for variations from Drawings related to sizing including, but not limited to, changes in pipe spool lengths due to equipment connections, valve sizes, and flexible coupling size changes.

2.02 APPROVED MANUFACTURERS

A. All new equipment described in this Section shall be supplied by a single manufacturer, who is regularly engaged in the manufacturing of regenerative filter equipment and associated components.

B. The naming of a manufacturer in this Specification is not an indication that the manufacturer's standard equipment is acceptable in lieu of the specified component features. Naming is only an indication that the manufacturer may have the capability of engineering and supplying a system as specified.

C. Approved Manufacturers

1. Paddock Industries.
2. Approved Equivalent prior to bid opening.

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

E. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.

2.03 GENERAL SYSTEM DESCRIPTION

A. One (1) complete and fully operational Regenerative Filter System shall be furnished for installation as shown on the Project Drawings.

B. Filter Basis-of-Design:

Paddock Model	PPEC1400S
Number of Tanks	1
Diameter	59"
Area	1141 sq.ft.
Flow Rate	1225 gpm
Filtration Rate	1.07 gpm/sq.ft.

2.04 FILTER TANK

A. Filter tank shall be diametrically divided into head and body components. Two shall be bolted together by means of external flanges and made water tight by an o-ring seal.

B. Filter body and head shall be of welded construction, with all welded surfaces, nozzles and brackets fabricated from Type 304L stainless steel. All joints shall be welded both internally and externally. Internal weld shall be a continuous seal weld to preclude crevice corrosion.

C. Support legs (3) shall be Type 304L stainless steel, stainless steel Type 304L pads shall be welded to filter body prior to leg attachment. Support legs shall be a custom length to provie the sump drain elevation shown on the section views.

D. Both body and head flange bolting surfaces shall be entirely supported by a full perimeter spacer ring, to preclude distortion of those surfaces by varying bolt tension.

E. All bolt and fastenings, both internal and external, shall be of Type 304L stainless steel.

F. Inspection window shall be heat tempered Pyrex glass and will be covered by a clear acrylic safety shield.

G. Tank shall be designed for a 50-psi working pressure using non-code criteria and have a safety factor of 4.

H. Filter tank shall incorporate connections for filter influent and effluent, drain, pre-coat inlet, pressure and vacuum relief ports, (2) -1/4-18 NPTF pressure taps, inspection window (1) 4" nominal diameter, bump shaft gland mount.

I. Filter effluent and pre-coat recycle connection shall be common to assure a non-shock transition between the pre-coat recycle and service flows.

J. Nozzle sizes for influent and drain connections are specific for their respective functions. Accordingly, separate nozzles are used with sizes as indicated on drawings.

K. Filter body shall incorporate an integral full diameter inlet distributor which directs the water to be filtered to the Flex-Tube™ bundle. Adjustable legs and a short turn top elbow shall be provided as part of the filter. Not to exceed 9'-1I1" in height.

L. On completing fabrication, all internal surfaces of filter tank shall be passivity according to procedure set forth in federal specifications QQ-P-35B, for austenitic 300 series corrosion - resisting steel.

2.05 FLEX-TUBES AND ASSEMBLY

A. Flex-Tubes™ shall be cylindrical in shape with each tube closed at the bottom and open at the top. Open shall be flanged to fit into the tube sheet.

B. Outer wall of Flex-Tube™ shall be made of multi-filament polyester braid with filaments arranged so that external pressure causes a diminution of the tube diameter and pore size. Conversely, internal pressure results in an enlargement of the diameter. Each tube shall have an internal stainless spring to limit diameter diminution. Membrane ends shall be impregnated with a polyester thermo set resin to reinforce the spring compression points.

C. Flex-Tubes™ shall have a recommended operating differential rating of 25 psi, and an ultimate of 75 psi. Elements cannot be longer than 38”.

D. Tube sheet shall retain Flex-Tubes™ and shall separate the filter tank into upper and lower sections. A seal shall be provided to prevent unfiltered water from bypassing the tube sheet into the upper clean side of the filter tank.

E. All components in the assembly shall be constructed from materials unaffected by corrosiveness of swimming pool water. Assembly shall be removed from filter tank for servicing as a unit; or, if desired, by dismantling the individual parts.

2.06 BUMP MECHANISM

A. Bump mechanism shall consist of an air-stroke™ actuator supported on a machined surface located on top of the filter head. It shall be connected to Flex-Tube™ assembly by a stainless-steel shaft and rod aligner.

B. During bumping, bump mechanism is alternately pressurized and de-pressurized, causing Flex-Tube™ assembly to move downward then upward in linear fashion over a stroke distance of approximately 2".

C. Bumping shall be both push-button initiated, and electronically programmed.

2.07 FILTER MEDIA

A. Diatomaceous earth (DE) media is required.

2.08 CONTROLS AND GAUGE ASSEMBLY

A. Provide gauge panel with two (2) 4-1/2 inch diameter gauges connected to the influent lines of filter; bump controller, air pressure regulator, air lubricator,

pressure stat, and associated air line.

2.09 FILTER ASSEMBLY

A. Entire filter assembly shall be approved and listed by National Sanitation Foundation (NSF).

2.10 FILTER PIPING AND VALVES

A. Filter unit shall be provided with supports and brackets, manifold, and elements. Piping shall be arranged to carry out operations of filtering, pre-coating, rinsing, and draining. External piping connections shall be flanged when larger than two inches. Filter tank assembly shall be provided with necessary pipe, valves, and fittings to make a complete battery from inlet to outlet.

B. The Filter System shall include but is not limited to the following valves.

1. Precoat Fill Valve: 4 inch diameter pnuematically operated butterfly valve.
2. Drain Valve: 4 inch diameter manually operated butterfly valve included with the filter tank.
3. Strainer Influent Check Valve: 10 inch diameter manually opertated check valve.

2.11 FILTER PRECAUTION

A. Filter tank must be properly anchored in place in full accordance with manufacturer's recommendations before being filled with water.

2.12 AUTOMATIC FILTER CONTROLLER

A. Provide an automatic filter controller to automatically regenerate and precoat Flex-Tube™ on a timed basis. Controller shall be equal to Paddock Regenerator model "MOD-1-SSC". Installation shall include all materials, pilot operated valves, air piping, etc., for a complete operating system equal to, but not limited to, the following:

1. Enclosure: single door, continuous hinge enclosure conforms to the NEMA standard for type 12 industrial use enclosures. Equipped with quick acting external screw clamps for securing the neoprene gasket cover. A sub-panel to be provided for mounting components.
2. Circulation pump motor control: variable frequency drive shall be functionally interlocked with MOD-1-SSC solid state control program.
3. Regeneration process shall be time based. There shall also be an interlock with computerized pool management controller to effect regeneration whenever a user adjustable pressure differential occurs.
4. MOD-I-SSC controller shall incorporate (3) normally open interlock contacts (3 amp max) and (1) 115 VAC output for connection to ancillary filter room equipment (UV units, heat exchangers, water chemistry controllers, booster pumps, heat recovery systems & etc.) providing functional coordination with the filter controller operating program.
5. MOD-I-SSC controller shall incorporate a normally open run contact, 4-20 ma PID loop output, staged precoat output, and run/fault inputs for connection to a variable speed drive motor controller.

6. Pilot operated valves: provide (2) solenoid pilot, electrically actuated 4-way valves to control (2) double acting rotary actuators mounted to (2) butterfly valves (precoat recycle and on-stream). Butterfly valves to be cast iron body EPDM seat with stainless steel (316) disc and shaft with acetal bushing.
7. Program for automatic filter controller shall be as follows; when signal to start regeneration occurs (2 hrs, 4 hrs...30 hrs) controller automatically:
   a. Switches off recirculation pump.
   b. Closes pool return valve.
   c. Opens precoat re-cycle valve.
   d. Initiates 3 bumps.
   e. Starts recirculation pump for a short precoat recycle (6 minutes).
   f. Opens pool return valve.
   g. Closes precoat re-cycle valve.

2.13 PNEUMATIC CONTROL SYSTEM

A. Pneumatic control system shall be piped by the filtration system installer to assure an integrated system. Compressor shall provide 100 psi dry pneumatic air to filter controller. Pool contractor is also responsible for mounting the bump cylinder on top of the filter tank with four bolts provided. He must then connect the pneumatic air to this mechanism and from there to the two automatic valves.

2.14 VACUUM TRANSFER PUMP

A. Filter system supplier shall provide manufacturer standard vacuum transfer pump for Filter System.

B. Provide wall mountable vacuum transfer pump loose from filter tank.

2.15 DRAIN BOOSTER PUMP

A. Filter system supplier shall provide manufacturer standard drain booster pump sized to ensure proper drainage rate of the filter tank.

B. Hard wire pump back to existing 208V electrical service.

2.16 STRAINER WITH INTEGRAL REDUCING PRECOAT TEE

A. Filter System supplier shall provide strainer manufactured with an integral reducing precoat tee as shown in drawings.

B. Review existing building conditions and verify strainer dimensions to ensure proper assembly with the Filter system.

C. Provide strainer with one (1) extra basket.

D. Product Data.

Inlet Size: 10 inches	Inlet Flange Diameter: 16 inches
Outlet Size: 10 inches	Outlet Flange Diameter: 16 inches
Basket Open Area	71.8 in^2
Ratio	5.66:1
Body Material	304L Stainless Steel

Basket Material	304L Stainless Steel
Lid Material	Polycarbonate
Design Working Pressure	60 PSI

2.17 AIR COMPRESSOR

A. Filter system supplier shall provide manufacturer standard Electric Air Compressor for Filter System.

B. Product Data.

Item	Electric Air Compressor
Paddock Model	#4ME98
Lubrication Type	Splash Lubricaiton
Air Tank Style	Vertical
Number of Stages	One (1)
Output Power	5 HP
Free Air Flow Rate at Max Pressure	14.2 CFM
Max Operational Pressure	135 PSI
Air Tank Size	60 Gal
Input Voltage	208-240V AC
Phase	Three (3)
Duty Cycle	Intermittent
Thermal Protection	Yes
Sound Level	85 dBA
Includes	Manual drain valve, oil sight glass, pressure gauge, pressure safety valve
Cylinder Material	Cast Iron
ASME Tank	Yes
Control Type	Pressure Switch

2.18 AIR LINE

A. Pneumatic valves shall be connected to their respective control solenoid located on the right side of the filter control mounting bracket (top is on-stream, bottom is pre-coat) using ¼” x 0.04” wall nylon or poly tubing.

B. Filter System supplier shall provide manufacturer standard air line for Filter System.

2.19 FLOW METER

A. Contractor shall provide one (1) Magmeter Flow Sensor per drawings.

2.20 VFD

A. Contractor shall provide one (1) variable frequency drive per drawings.

PART 3 EXECUTION

3.01 DELIVERY, STORAGE, AND HANDLING

A. Contractor and Filter System Supplier shall review Filter installation requirements prior to shipping the Filter equipment. The filter tank may need to be tipped horizontally in order to be moved through existing building doors and to the final installation location.

B. Assembly of the Filter System must be performed at the factory. Once assembled and tested, the Filter System shall be shipped assembled, and ready to be set in place by the Contractor. Only equipment anchorage, electrical connections, and threaded piping connections will be required in the field to install the Filter System.

C. All equipment items will be properly packaged to prevent damage and shipped for assembly in the field. Upon delivery to the jobsite, all equipment and materials will be inspected against the approved Shop Drawings. Equipment or materials damaged or not meeting requirements of the approved submittals will immediately be returned to the Filter System Supplier for repair or replacement.

D. Upon arrival of equipment at the site, the Contractor shall be responsible for unloading, handling, storage, protection, and installation of the equipment.

E. All components shall be installed immediately upon receipt from the Filter System Supplier or stored in strict conformance with storage recommendations provided by the supplier.

3.02 EXAMINATION AND PREPARATION

A. The Contractor shall inspect all equipment and materials against approved Shop Drawings at time of delivery. Equipment and materials damaged or not meeting requirements of the approved Shop Drawings shall be immediately returned to the Filter System Supplier for replacement or repair.

B. Equipment and materials shall be stored by the Contractor in a dry location and protected from the elements according to the Filter System Supplier's instructions.

C. Equipment and materials shall be handled in an approved manner according to the Filter System Supplier's instructions.

3.03 INSTALLATION

A. Installation of the Filter, pumps, and all system appurtenances shall be performed by the Contractor and shall be in accordance with the Drawings and with the Filter System Supplier’s instructions and recommendations. Conflicts of information shall be called to the attention of the Engineer.

B. Installation shall include furnishing and applying an initial supply of lubricants, as provided by the Filter System Supplier.

C. Contractor shall support piping independent of equipment. Equipment shall be free from all loads and stresses induced by the piping.

D. All equipment including motors, belts, and drives shall be aligned to the best industrial standards. Field check and adjust all equipment alignments in the presence of the Engineer.

E. The Contractor shall inspect all equipment before installation; if damaged, notify the Engineer and Filter System Supplier promptly. Do not install damaged equipment until repairs are made in accordance with Filter System Supplier's written instruction and approval.

F. Contractor shall make all electrical connections in conformance with the requirements of Division 26 – Electrical.

3.04 FIELD QUALITY CONTROL

A. The Installation Contractor shall verify whether Filter System was stored properly for short or extended period per Filter System supplier's guidelines.

B. The Installation Contractor and Filter System Supplier shall make equipment adjustments such as adjusting pump water pressure required to place system in proper operating condition.

C. If the Filter System fails to meet any of the specified performance requirements, the Installation Contractor and/or Filter System Supplier shall modify and/or replace defective equipment until it meets specified requirements. Re-test system to verify satisfactory operation.

D. System Start-Up and Training:

1. The Contractor will verify in writing that the project is ready for manufacturers field services. Copies of written verification shall be given to the manufacturer, Engineer, and Owner prior to scheduling field services.
2. The Contractor shall provide the services of a factory representative during start-up of the treatment equipment. The following system start-up and training field services are required:

E. Contractor shall visually verify that filter system wiring is consistant with schematic drawings and continuity test to verify wiring.

a. Start-up and Training Site Visit Trips: One (1) trip consisting of three (3) 8-hr days on-site not including travel.

2. At a minimum, the equipment manufacturer's technician shall perform the following start-up functions:
   a. Inspect the final installation to assure proper installation, connection and wiring of all equipment of the manufacturer's supply.
   b. Start-up of the equipment in the presence of the Contractor, Engineer, and Owner's operating personnel.

c. Training of Owner's operating personnel in proper operation and maintenance procedures, start-up/shutdown procedures, response to emergency conditions, and troubleshooting. The responsibility of the Contractor and the factory service representative with regard to start-up shall be fulfilled when the start-up is complete, the equipment is functioning properly, operating personnel have been trained and the equipment has been accepted by the Owner.

3.05 TESTING AND CERTIFICATION

A. Contractor and Filter System Supplier shall verify that structures, equipment, pumps, and motors are compatible for an efficient system.

B. Contractor and Filter System Supplier shall make equipment adjustments required to place system in proper operating condition.

C. The Filter System Supplier shall furnish all testing equipment and devices required for system start-up.

D. After start-up and prior to final acceptance, the Contractor and Filter System Supplier shall conduct Engineer witnessed performance demonstration tests on the Filter System. Tests will be scheduled with the Engineer at least 2 weeks prior to the planned test date.

E. If the Filter System fails to meet any of the specified performance requirements, Contractor and/or Filter System Supplier shall modify and/or replace defective equipment until it meets specified requirements. Re-test system to verify satisfactory operation.

F. The Contractor shall, after installation of complete Filter System, insure that all pipes, pumps, fittings, connections, unions, and all other appurtenances are free from leaks.

G. After testing and start-up of system, Filter System Supplier shall furnish Owner and Engineer with a written report certifying that the Filter System and its components:

1. Have been properly installed.
2. Are in accurate alignment.
3. Are free from undue stress imposed by connecting piping, anchor bolts, or operational water hammer.
4. Have been satisfactorily operated under all operating range conditions.

H. See Section 01 40 00 - Quality Requirements for additional requirements.

END OF SECTION 13 11 50

SECTION 13 11 60
POOL CHEMICAL TREATMENT EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Furnishing, installation, and testing of the following, as indicated, in accordance with the provision of the Contract Documents:
   a. Chlorinator
   b. Acid Feeder

B. Related Sections include:

1. Division 1 - General Requirements.
2. Division 13 - Special Construction
3. Division 26 – Electrical.

1.02 GENERAL

A. All electrical, mechanical, metal, painting, and instrumentation work included herein shall conform to the applicable Sections or Divisions of the Contract Documents.

B. Power shall be provided by the Contractor to the Chlorinator and Acid Feeder control panels as shown on the Drawings. The Contractor shall be responsible for providing all necessary conduit and wiring necessary for complete electrical service to the specified location.

C. Wiring between components shall be provided by the Contractor in accordance with the Drawings and Specifications.

D. The Drawings show details of the Chlorinator and Acid Feeder components and their overall relationships. Not all items incidental to the Chlorinator and Acid Feeder are shown or specified. It is the intent of this Section that the Chlorinator and Acid Feeder Supplier is to provide a complete and operational system whether or not any specific and/or required system component is shown or specified herein.

E. The General Contractor shall provide and install the Chlorinator and Acid Feeder in accordance with approved submittal drawings. The Chlorinator and Acid Feeder Supplier shall inspect the installation of the Chlorinator and Acid Feeder systems, and the Contractor shall correct any deficiencies identified.

F. The Chlorinator and Acid Feeder Supplier shall be responsible for programming the Chlorinator and Acid Feeder control panel software and shall assist Engineer with assuring Chlorinator and Acid Feeder systems communicate with associated pool filtration control systems.

G. The Chlorinator and Acid Feeder Supplier shall perform functional and start-up testing of the Chlorinator and Acid Feeder Systems.

1.03 SYSTEM DESCRIPTION

A. The Calcium Hypochlorite Tablet Chorination System (Chlorinator) and the Acid-Rite pH Adjustment System (Acid Feeder) shall be supplied and guaranteed by one manufacturer.

B. Calcium Hypochlorite Tablet Chlorination System.

1. The system shall be designed to feed low concentrations of calcium hypochlorite in solution intermittently or continuously as required for pool and spa applications. The system shall be a single pre-assembled, package unit with a welded aluminum frame consisting of chlorinator, electrical box, centrifugal pump, and balance tank for ease of installation and operation.
2. Basis of Design system is the PowerBase Model 3140AT by Westlake Water Solutions Corporation. Accu-Tab® Blue SI calcium hypochlorite tablets by Westlake Water Solutions Corporation is the basis of design including the solution modifier and the blue colorant added for safety (to help prevent accidental mixing with other chemicals).
3. The base proposal requires furnishing equipment as specified herein, though substitutions will be considered. The bidder is cautioned that substitutions must meet the quality and operational requirements of each feature specified in Section 2.03 below. Batch systems with pressure mixing components producing chlorine concentrations exceeding the limits of the specifications will not be considered.
4. Any system offered shall use an NSF Standard 50 listed erosion feeder and tablet combination, and shall be capable of meeting all requirements of the Health Department having jurisdiction over the installation.

C. Acid-Rite pH Adjustment System.

1. The basis of design system is designed to erode *Acid-Rite* tablets, creating an acid solution, and feeding the solution intermittently or continuously as required for pool applications. The system is a single pre-assembled, package unit with a welded aluminum frame consisting of an *Acid-Rite* AR 2500 feeder, electrical box, centrifugal pump, and balance tank for ease of installation and operation. The system is the *Acid-Rite* pH Adjustment System 2500 by Westlake Water Solutions. *Acid-Rite* Tablets by Westlake Water Solutions are used with a red colorant added for safety (to help prevent accidental mixing with other chemicals). Feeder capacity is 250 pounds of tablets.
2. The base proposal requires furnishing equipment as specified herein, though substitutions will be considered. The bidder is cautioned that substitutions must meet the quality and operational requirements of each feature specified in Section 2.03 below.
3. Any system offered shall use an NSF Standard 50 listed erosion feeder and tablet combination, and shall be capable of meeting all requirements of the Health Department having jurisdiction over the installation.

1.04 SUBMITTALS

A. Shop Drawings and Product Data shall be submitted in accordance with specification Section 01 13 00-Submittals and shall include detailed specifications, drawings, and data covering the following information and all materials, parts, devices, equipment, dimensions, components, properties, and other accessories forming part of equipment for the complete operational system.

1. Descriptive literature, bulletins, and catalogs, manufacturing, fabrication, and installation detail sheets for Chlorinator and Acid Feeder equipment and other related appurtenances.
2. Materials of construction for all major components, including fasteners.
3. Elevation and plan views of all components and assemblies showing configuration, construction, dimensions, and fastening details.
4. Installation and leveling data.
5. Provide Engineer with sequence of operations and system control adjustments.
6. Details submitted shall include as a minimum: plans, sections, and details of equipment components and connections.
7. Testing Procedures: Detailed start-up, hydraulic, and testing procedures.

B. Furnish Manufacturer's field service reports under provisions of Section 01 33 00, reports covering start up, adjusting, commissioning, demonstration, and training.

C. Submit operation and maintenance manuals and Manufacturer's instructions in accordance with Sections 01 33 00 and 01 78 23.

D. Equipment shall not be fabricated until manufacturer receives written approval of submitted information.

1.05 QUALITY ASSURANCE

A. The equipment and material to be furnished under this Contract shall be in accordance with Section 01 45 00 Quality Controls and Section 01 61 00 Common Product Requirements.

B. Chlorinator and Acid Feeder Supplier Qualifications – The Chlorinator and Acid Feeder Supplier shall have experience in furnishing equipment of similar capacity and service capability to the equipment specified herein. As part of the submittal package, the Chlorinator and Acid Feeder Supplier shall submit the following to verify qualifications:

1. Evidence that equipment of similar capacity and service capability has been in successful operation in at least five (5) separate installations within the continental United States.
2. Current NSF Standard 50 (NSF-50) Certification for both the Chlorinator and the Acid Feeder being offered.

C. Factory Testing:

1. The Chlorinator and Acid Feeder shall be factory tested prior to shipment, and then shipped assembled. The tests shall include plumbed

assemblies, control panel functionality, and general system wiring verifications as outlined below. A copy of test results shall be certified and included in the equipment shipment.

a. Plumbed Assemblies:
   1) Visual inspection of general workmanship.
   2) Visual verification that the arrangement and dimensions of the assembly are consistent with the Drawings.
   3) Visual verification of nameplate information.
   4) Hydrostatic test all skid mounted components

b. Control Panel:
   1) Visual inspection of general workmanship.
   2) Visual verification that the control panel layout is consistent with the layout and schematic Drawings.
   3) Visual verification of nameplate information.
   4) Simulation of inputs/outputs to verify correct wiring and correct software functionality.
   5) Continuity test to verify wiring.
   6) Confirm and document all system alarms and faults.

c. General Chlorinator and Acid Feeder Wiring:
   1) Visual inspection of general workmanship.
   2) Visual verification that wiring is consistent with schematic drawings.
   3) Continuity test to verify wiring.

1.06 FIELD CONDITIONS

A. Existing Conditions: The chemical treatment systems are wholly installed within an existing wood-framed equipment shed. The chlorination system and acid feeder system are installed in the South-West corner of the existing building..

1.07 WARRANTY REQUIREMENTS

A. A written warranty shall be provided for the equipment specified in this Section. The warranty shall be for a minimum period identified herein and shall begin from the date of Substantial Completion, as defined in Section 01 77 00 Closeout Procedures. Such warranty shall cover all defects or failures of materials or workmanship that occur as the result of normal operation and service. No prorated warranty will be accepted.

   1. Contractor’s Warranty: Two (2) Year.
   2. Manufacturer’s Warranty: Minimum of two (2) year but not less than manufacturer’s standard warranty period.

PART 2 PRODUCTS

2.01 GENERAL

A. The Drawings have been prepared based on Westlake Water Solutions Corp equipment. While other manufacturers are approved, variation in design may result in variations in pipe sizes and equipment orientation. Contractor shall assume all responsibility for variations from Drawings related to sizing including, but not limited to, changes in pipe spool lengths due to equipment connections,

valve sizes, and flexible coupling size changes.

2.02 APPROVED MANUFACTURERS

A. All new equipment described in this Section shall be supplied by a single manufacturer, who is regularly engaged in the manufacturing of chlorinator and acid feeder equipment and associated components.

B. The naming of a manufacturer in this Specification is not an indication that the manufacturer's standard equipment is acceptable in lieu of the specified component features. Naming is only an indication that the manufacturer may have the capability of engineering and supplying a system as specified.

C. Approved Manufacturers

1. West Lake Solutions Corporation.
2. Approved Equivalent.

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

E. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.

2.03 GENERAL SYSTEM DESCRIPTION

A. One (1) complete and fully operational Chlorinator System and One (1) complete and fully operational Acid Feeder System shall be furnished for installation as shown on the Project Drawings.

B. Chlorination System Features:

1. Basis-of-design: PowerBase Model 3140AT by Westlake Water Solutions Corporation.
2. A maximum chlorine solution level of 0.1% (1000 ppm) shall be maintained to prevent calcification in system components. Systems producing chlorine concentrations higher than 0.1% shall not be acceptable.
3. Delivery shall be by erosion feed technology to control accurate and consistent concentration limits in the chlorine treatment solution. Soaking type, spray and/or vortex technology systems shall not be acceptable.
4. The chlorinator shall automatically and continuously feed a limited quantity of chlorine in solution as needed; when the system is not running, no more chlorine than that amount which can be fed in one minute or less shall be left in the tank to prevent dilution. Batch systems preparing excess quantities of solution for delivery over an extended period shall not be acceptable.
5. A centrifugal pump wired to the system electrical box shall feed freshly mixed chlorine treatment solution only as required for maximum efficiency. Batch systems requiring the use of a metering pump or pumps to feed pre-prepared standing solution shall not be acceptable.
6. All piping in the chlorinator unit shall be Schedule 40 PVC. Systems with flexible tubing shall not be acceptable.

C. Acid Feeder System Features:

1. Basis-of-design: Acid-Rite pH Adjustment System 2500 by Westlake Water Solutions Corportation.
2. Delivery shall be by erosion feed technology for accurate control of acid addition. Soaking type, spray and/or vortex technology systems shall not be acceptable.
3. The acid feed system shall automatically and continuously feed a limited quantity of acid solution as needed. When the system is not running, no more acid solution than that amount which can be fed in 2 minutes or less shall be left in the tank to prevent dilution. Batch systems preparing excess quantities of solution for delivery over an extended period shall not be acceptable.
4. A centrifugal pump wired to the system electrical box shall feed freshly mixed acid solution only as required for maximum efficiency. Batch systems requiring the use of a metering pump or pumps to feed pre-prepared standing solution shall not be acceptable.
5. All piping in the acid feed system shall be Schedule 40 PVC. Systems with flexible tubing shall not be acceptable.
6. Feeder capacity is 250 pounds of tablets.
7. NSF Std 50 Maximum delivery rate: Pool 37.5 # tablets/hr. at 10 gpm

2.04 CHLORINATION SYSTEM COMPONENTS.

A. Tablet Chlorinator: Accu-Tab® chlorinators by Westlake Water Solutions Corporation are designed exclusively for Accu-Tab® Blue SI calcium hypochlorite tablets by Westlake Water Solutions Corporation. Tablets are placed on a sieve plate inside the chlorinator; as water flows across the sieve plate, the tablets erode at a rate proportional to the flow rate.

B. Inlet Water Supply Connection: Model 3140AT. 2” Socket (water supply of 60 GPM required).

C. Flow Meter: A rotameter (flow-through) flow meter, measuring the flow of the water- dissolving stream to the chlorinator.

D. Solution Tank: Made of PVC. Capacity 22 gallons.

E. Primary Solution Tank Level Control: Made from Schedule 80 PVC and 316L stainless steel. The float valve opens or closes to maintain the pump rate as it is manually throttled.

F. Solution Delivery Pump: Delivers chlorinated solution to the return line. A single-stage centrifugal pump is provided for systems with pressures up to 20 PSIG. (For systems requiring a discharge pressures greater than 20 PSIG, a custom selected pump shall be utilized.)

G. Solution Injection Pump Air Bleed: Used to prime the pump at start-up, or at any time, if necessary.

H. Overflow Protection: Two level switches in the upper portion of the solution tank will run the pump from high to lower level to prevent system overflow.

I. Primary Backflow Prevention: A PVC check valve prevents reverse flow of water into the system.

J. Discharge Control Valve (manual): PVC gate valve mounted on the pump discharge allows operator to adjust flow of water-dissolving stream.

K. Outlet Connection: Model 3140AT. 2” Socket.

L. Nema 4X Electrical Enclosure.

M. Aluminum Frame, Type 6061-T.

N. Electrical Requirements:

1. Two electrical circuits are required for operation: (1) 120v 20 amp power, and (1) 120v control circuit from a pool controller.

2.05 ACID FEEDER SYSTEM COMPONENTS.

A. Acid Feeder: *Acid-Rite* feeders by Westlake Water Solutions are designed exclusively for Acid-Rite tablets by Westlake Water Solutions. Tablets are placed on a sieve plate inside the feeder; as water flows across the sieve plate, the tablets erode at a rate proportional to the flow rate.

B. Inlet Water Supply Connection: 1” Socket (water supply of 10 GPM required)

C. Solution Tank: Made of polyethylene. Capacity: 22 gallons

D. Primary Solution Tank Level Control: Made from Schedule 80 PVC and 316L stainless steel, this 1” float valve meters the flow through the feed system. The float valve opens or closes to maintain the pump rate as it is manually throttled.

E. Solution Delivery Pump: Delivers acid solution to the aquatic system return line. A single-stage centrifugal pump is provided for systems with pressures up to 20 PSIG.

F. Solution Injection Pump Air Bleed: Used to prime the pump at start-up, or at any time, if necessary.

G. Flow Meter: A flow meter, measuring the flow of the water-dissolving stream through the feed system.

H. Primary Backflow Prevention: A PVC flap checkvalve and a an additional vertically- mounted ball checkvalve.

I. Discharge Flow Control Valve (manual): PVC gate valve allows operator to adjust flow of solution to the pool system.

J. Outlet Connection: 1” Socket

K. Overflow port: 1.5" FPT port is located on the back side of the feeder solution tank. Can be plumbed to drain as desired.

L. Divider Plates: Plates are provided to make various size compartments to permit control of lower delivery rates.

M. NEMA 4X Electrical Enclosure.

N. Aluminum Frame, Type 6061-T.

O. Electrical Requirements:

1. Two electrical circuits are required for operation: (1) 120v 20 amp power, and (1) 120v control circuit from a pool controller.

PART 3 EXECUTION

3.01 DELIVERY, STORAGE, AND HANDLING

A. Assembly of the Chlorinator and Acid Feeder must be performed at the factory. Once assembled and tested, the Chlorinator and Acid Feeder systems shall be shipped assembled, and ready to be set in place by the Contractor. Only equipment anchorage, electrical connections, and threaded piping connections will be required in the field to install the Chlorinator and Acid Feeder systems.

B. All equipment items will be properly packaged to prevent damage and shipped for assembly in the field. Upon delivery to the jobsite, all equipment and materials will be inspected against the approved Shop Drawings. Equipment or materials damaged or not meeting requirements of the approved submittals will immediately be returned to the Chlorinator and Acid Feeder Supplier for repair or replacement.

C. Upon arrival of equipment at the site, the Contractor shall be responsible for unloading, handling, storage, protection, and installation of the equipment.

D. All components shall be installed immediately upon receipt from the Chlorinator and Acid Feeder Supplier or stored in strict conformance with storage recommendations provided by the supplier.

3.02 EXAMINATION AND PREPARATION

A. The Contractor shall inspect all equipment and materials against approved Shop Drawings at time of delivery. Equipment and materials damaged or not meeting requirements of the approved Shop Drawings shall be immediately returned to the Chlorinator and Acid Feeder Supplier for replacement or repair.

B. Equipment and materials shall be stored by the Contractor in a dry location and protected from the elements according to the Chlorinator and Acid Feeder Supplier's instructions.

C. Equipment and materials shall be handled in an approved manner according to the Chlorinator and Acid Feeder Supplier's instructions.

3.03 INSTALLATION

A. Installation of the Chlorinator, Acid Feeder, and all system appurtenances shall be performed by the Contractor and shall be in accordance with the Drawings and with the Chlorinator and Acid Feeder Supplier’s instructions and

recommendations. Conflicts of information shall be called to the attention of the Engineer.

B. Installation shall include furnishing and applying an initial supply of lubricants, as provided by the Chlorinator and Acid Feeder Supplier.

C. Contractor shall support piping independent of equipment. Equipment shall be free from all loads and stresses induced by the piping.

D. All equipment including motors, belts, and drives shall be aligned to the best industrial standards. Field check and adjust all equipment alignments in the presence of the Engineer.

E. The Contractor shall inspect all equipment before installation; if damaged, notify the Engineer and Chlorinator and Acid Feeder Supplier promptly. Do not install damaged equipment until repairs are made in accordance with Chlorinator and Acid Feeder Supplier's written instruction and approval.

F. Contractor shall make all electrical connections in conformance with the requirements of Division 26 – Electrical.

3.04 FIELD QUALITY CONTROL

A. The Installation Contractor shall verify whether Chlorinator and Acid Feeder was stored properly for short or extended period per Chlorinator and Acid Feeder supplier's guidelines.

B. The Installation Contractor and Chlorinator and Acid Feeder Supplier shall make equipment adjustments such as adjusting pump station water pressure required to place system in proper operating condition.

C. If the Chlorinator and Acid Feeder systems fail to meet any of the specified performance requirements, the Installation Contractor and/or Chlorinator and Acid Feeder Supplier shall modify and/or replace defective equipment until it meets specified requirements. Re-test system to verify satisfactory operation.

D. System Start-Up and Training:

1. The Contractor will verify in writing that the project is ready for manufacturers field services. Copies of written verification shall be given to the manufacturer, Engineer, and Owner prior to scheduling field services.
2. The Contractor shall provide the services of a factory representative during start-up of the treatment equipment. The following system start-up and training field services are required:
    a. Start-up and Training Site Visit Trips: One (1) trip consisting of three (3) 8-hr days on-site not including travel.
3. At a minimum, the equipment manufacturer's technician shall perform the following start-up functions:
    a. Inspect the final installation to assure proper installation, connection and wiring of all equipment of the manufacturer's supply.

b. Start-up of the equipment in the presence of the Contractor, Engineer, and Owner's operating personnel.
c. Training of Owner's operating personnel in proper operation and maintenance procedures, start-up/shutdown procedures, response to emergency conditions, and troubleshooting. The responsibility of the Contractor and the factory service representative with regard to start-up shall be fulfilled when the start-up is complete, the equipment is functioning properly, operating personnel have been trained and the equipment has been accepted by the Owner.

3.05 TESTING AND CERTIFICATION

A. Contractor shall verify that structures, equipment, pumps, and motors are compatible for an efficient system.

B. Contractor shall make equipment adjustments required to place system in proper operating condition.

C. The Contractor shall furnish all testing equipment and devices required for system start-up.

D. After start-up and prior to final acceptance, the Contractor shall conduct Engineer witnessed performance demonstration tests on the Chlorinator and Acid Feeder systems. Tests will be scheduled with the Engineer at least 2 weeks prior to the planned test date.

E. If the Chlorinator and Acid Feeder systems fail to meet any of the specified performance requirements, Contractor shall modify and/or replace defective equipment until it meets specified requirements. Re-test system to verify satisfactory operation.

F. The Contractor shall, after installation of complete Chlorinator and Acid Feeder, insure that all pipes, pumps, fittings, connections, unions, and all other appurtenances are free from leaks.

G. After testing and start-up of system, the Contractor shall furnish Owner and Engineer with a written report certifying that the Chlorinator and Acid Feeder systems and their components:

1. Have been properly installed.
2. Are in accurate alignment.
3. Are free from undue stress imposed by connecting piping, anchor bolts, or operational water hammer.
4. Have been satisfactorily operated under all operating range conditions.

H. See Section 01 40 00 - Quality Requirements for additional requirements.

END OF SECTION 13 11 60