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Revised

SPECIFICATIONS

AND

RELATED DOCUMENTS

FOR

CITY OF IRONWOOD

Ice Refrigeration Replacement
Pat O'Donnell Civic Center

2026

BID ADVERTISEMENT

The City of Ironwood is soliciting bids for replacement the Ice Refrigeration System at the Pat O'Donnell Civic Center in Ironwood Michigan. The project includes replacing the existing refrigeration system with a new complete refrigeration system, including one outdoor refrigeration system and two icy rink floor pumps with construction to take place between May 1 and August 21, 2026. State or federal funds are being used to assist in construction and all relevant State or federal requirements will apply. All work will need to be in compliance with the Build America, Buy America (BABA) Act.

The Ironwood City Clerk in the Memorial Building, Ironwood, Michigan 49938, will receive sealed offers until 10:00 A.M. (local time) on Tuesday, March 17, 2026, at which time the bids shall be read aloud.

Bid Documents may be obtained from the City Clerk, Memorial Building, 213 S. Marquette Street, Ironwood, Michigan 49938, or by visiting www.ironwoodmi.gov/government/projects.

The City reserves the right to accept or reject any and all bids.

Jennifer L. Jacobson
City Clerk

Not Run in Newspaper

Proposal for replacement of:

Ice Refrigeration System

With Bids Received Until 10:00 A.M. C.S.T. on Tuesday, March 17, 2026.

PROPOSAL OF:____________________________Company Name
____________________________ Address
____________________________ Email
____________________________Phone

Locations: Ironwood Memorial Building
213 S. Marquette St.
Ironwood, MI 49938

Completion Date: August 21, 2026

Base Bid: _______________________________________

Bid Alternate 1: __________________________________

Bid Alternate 2: __________________________________

Bid Alternate 3:___________________________________

Bid Alternate 4:___________________________________

Bid Alternate 5:___________________________________

Bid Alternate 6:___________________________________

Bid Alternate 7:___________________________________

SPECIAL PROVISIONS

1. Consideration of Proposals

(a) One Contract will be awarded to the lowest responsive and responsible bidder based on the total base bid price for all items. Bid alternates may or may not be executed depending on project funding availability. The City reserves the right to accept or reject any or all bids and to waive technicalities as may be deemed best for the interests of the City of Ironwood.

2. Requirements for Performance Security and Payment Security.

(a) The successful bidder, at the execution of the contract, shall furnish security to guarantee faithful performance of the contract in the amount of 100% of the total contract price.
(b) The successful bidder shall also furnish security to guarantee payment to all persons supplying labor or materials in the performance of the contract in the amount of 100% of the total contract price.
(c) Security may be in the form of a performance bond and payment bonds, postal money order, certified check or cashier's check.
(d) Upon completion of project the contractor shall provide lien wavers from all contractors and suppliers.

3. Commencement, Execution and Completion of Work

(a) The Contractor shall be required to complete work under this Contract by **August 21, 2026**. Start date is assumed to be after May 1, 2026, but earlier dates may be discussed and possibly approved by the Owner.
(b) Execute the work diligently.
(c) Working hours are between 6:00 A.M. and 6:00 P.M.
(d) A work schedule shall be provided and approved by a City Representative A minimum of 48-hour notice shall be given prior to beginning work.
(e) Work may be completed on Saturday's or Sunday's as long as notice is given to the Owner
(f) The contractor shall coordinate all work closely with the City Representative.

4. Failure to Complete Work Within Contract Time

If the Contractor fails to prosecute the work, or any separate part thereof with such diligence as will ensure its completion within the time specified in this contract, fixed and agreed

Liquidated Damages will be assessed for each calendar day of delay until the work is completed and accepted.

Work to be Completed By:	Daily Charge
August 21, 2026	$200.00

5. **Warranty**

The contractor shall be responsible for any and all defects that may develop in any part of the entire work or materials furnished by him/her. Upon written notice of the City of Ironwood, the contractor shall immediately replace and make good, without expense to the owner, any material or workmanship. The Base Bid shall include a 1-year parts and labor warranty for the chiller system. The base bid will be paid to 100% upon completion of the project. No money will be held back during the 1-year warranty period. Bid Alternate 7 is added for the Contractor to provide a price for years 2 through 5 for a 5-year parts and labor warranty for the chiller system.

6. **Maintaining Access to the Building**

(a) The contractor shall work with the building owner to coordinate access to the remaining part of the building for other seasonal use of the building.

7. **Clean Up**

The contractor shall always keep work areas free from accumulation of waste material or rubbish. Upon completion of work, the contractor shall remove all waste, tools, equipment, and surplus materials from all work areas.

8. **Additional Responsibilities**

The contractor, employees, or representatives of the contractor, shall conduct themselves in a professional manner.

9. **Definitions**

(a) Project Title: Pat O'Donnell Civic Center Ice Refrigeration Replacement
(b) City Representatives designated for the administration of this contract shall be:

Jay Kivisto, Rink Manager – 906-364-4564
Dennis Hewitt, Building Inspector – 906-932-5050 ext. 115
Paul Anderson, City Manager – 906-932-5050 ext. 116

10. **Explanation of Bid Items**

Contractor shall be responsible to obtain all necessary permits and be in compliance with all applicable federal, state, and local laws, rules and regulations.

11. **Drawings and Specifications:**

The attached Specification "Section 13 18 00 Ice Rink System" and Drawing "R-100" will serve as a contract document and shall be followed for this project. Any conflicts between that specification and this document should be brought to the attention of Paul Anderson, City Manager, (the Prime Professional for this project) for clarification.

BIDDING REQUIREMENTS, CONDITIONS
AND CONTRACT ADMINISTRATION

1. Competency of Bidders

The City Manager reserves the right to select bidders and may refuse to issue a proposal to any individual, partnership, firm or corporation based upon but not limited to one or more of the following facts:

(1) For having defaulted on previous contracts.
(2) For having preformed similar work in an unsatisfactory manner.
(3) When in the City Manager's judgment, the bidder does not have the required experience in the class of work bid on, fails to have the proper labor and equipment, or fails to have sufficient capital or quick asset to finance the work.

2. Interpretation of Estimates, Specifications, Special Provisions and Site of Work

The bidder is required to examine carefully the site of work, plans, specifications, and contract form for the proposed work. It will be assumed that he has judged for and satisfied himself as to the conditions to be encountered, as in the work, materials furnished, and in the above documents. The bidder is assumed to have familiarized himself with the Federal, State, and Local laws, which may affect the work, workers, or materials furnished.

3. Delivery of Proposal

Each proposal must be submitted in a sealed envelope with the bidders name and address on the outside of the envelope. All proposals must be received on or before the hour stated in the advertisement. More than one proposal for the same project from an individual, partnership, firm, or corporation will not be considered. Faxed bids shall not be accepted. Email proposals will be accepted and shall be emailed to both Jen Jacobson @ clerk@ironwoodmi.gov and Paul Anderson @ andersonp@ironwoodmi.gov .

4. Public Opening of Proposals

Proposals will be opened publicly and read aloud at the hour, date, and place set in the advertisement.

5. Work performed in Accordance with Laws

The contractor and any subcontractors must comply with all requirements of 1976 PA 453 (Elliott-Larsen Civil Rights Act) and 1976 PA 220 (Persons with Disabilities Civil Rights Act), as amended. The contractor and any subcontractors not to discriminate against an employee or applicant for employment with respect to hire, tenure, terms, conditions, or privileges of employment, or a matter directly or indirectly related to employment, because of race, color, religion, national origin, age, sex, height, weight, marital status or a disability that is unrelated to the individual's ability to perform the duties of a particular job or position.

5. Build America, Buy America Act (BABA)

All of the iron, steel, manufactured products, and construction materials used in the project must be produced in the United States and compliant with the Build America, Buy America Act.

6. Chiller Manufacturer

For the Chiller manufacturer, York or Trane systems will be treated as approved systems; other manufacturers will need to be submitted to the City Engineer via email to be reviewed and confirmed as an "approved equal".

REQUIRED INSURANCE

(a) Workmen's Compensation Insurance – The Contractor, prior to the execution of the Contract, shall file a certification that the Contractor carries Worker's Compensation Insurance.

(b) Bodily Injury and Property Damage Insurance – The Contractor prior to execution of the Contract, shall file with the City of Ironwood copies of completed certificates of insurance, as evidence that the Contractor carries adequate insurance to afford protection against all claims for damages to public or private property and injuries to persons, arising out of and during the progress of work. The minimum limits of insurance shall be as follows:

(c) General Liability
Bodily Injury and Property Damage Liability:
Each Occurrence…..................$1,000,000
Aggregate…......................……$2,000,000

(d) Automobile Liability Insurance (Comprehensive Form)
Bodily Injury Liability:
Each Person…....................….. $ 500,000
Each Occurrence…..................$1,000,000

Property Damage Liability:
Each Occurrence…..................$1,000,000

Combined Single Limit for Bodily Injury and Property Damage Liability:
Each Occurrence…...................$2,000,000

(e) The requirements for 1 and 2 above, may be met through an Umbrella Policy.

(f) Owners Protective Liability. Bodily injury and property damage protection, including general supervision of work performed, shall be extended to the City of Ironwood employees and agents. The minimum limit shall be $1,000,000.

SECTION 13 18 00

ICE RINK SYSTEM

OCTOBER 15, 2025

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Ice system description, design criteria, start-up and shutdown services, and warranty for a new refrigeration system.

1.02 RELATED DOCUMENTS

A. Drawing Sheet R-100.

1.03 GENERAL PROJECT DESCRIPTION

A. Furnish and install a complete refrigeration system and pumping system including one (1) outdoor refrigeration system package and two (2) ice rink floor pumps.

B. Project Schedule: By Owner.

1.04 QUALITY ASSURANCE

A. Contractors wishing to bid/quote on this project must submit, with their bid, the following prequalification criteria.

1. As evidence and assurance of the contractor’s ability to construct the project and support the Owner’s system with service the contractor must have successfully completed five (5) ice rink construction projects that are similar to this project were completed within the past five (5) years. Submit information on each project. <u>Submittal shall be on company letterhead, signed by an authorized representative of the company and include; project description, portion of project completed by the company, location, construction cost, completion date, owner's name, owner's representative, phone number and completion date of work.</u>

2. As evidence and assurance of the contractor’s controls subcontractor’s ability to construct the project the control subcontractor must have successfully completed the programming and installation of two (2) ice rink construction projects that are similar to this project were completed within the past five (5) years. Submit information on each project. <u>Submittal shall be on company letterhead, signed by an authorized representative of the company and include; project description, portion of project completed by the company, location, construction cost, completion date, owner's name, owner's representative, phone number and completion date of work.</u>

B. Contractors wishing to bid on this project shall perform an on-site investigation prior to submitting a bid for the project. Contractor shall field verify all equipment and materials that will be affected by the work of this project and report any concerns to the Owner at least ten (10) business days prior to the bid opening date.

1.05 GENERAL REQUIREMENTS

A. Contractor shall apply for and obtain all permits required to perform Work.

B. Provide all invoices and detailed information required for the Owner to receive energy rebates and grants as required by those programs.

C. Material and System Testing: Schedule and pay for all testing of materials and systems, even if not explicitly stated in these specifications.

D. The Contractor shall coordinate all work with the construction management firm or general contractor and all other contractors and subcontractors on the project including scheduling and drawings.

E. Product delivery, storage and handling of materials and equipment shall meet requirements of Division 1 and General and Supplemental Conditions Sections.

F. The Contractor shall furnish and install all equipment, materials and labor, including all necessary incidentals, whether referred to or not, as required to complete the work and provide a complete, operating ice system.

G. The Contractor shall provide all electrical work, materials and equipment necessary for a complete, operational refrigeration system. All work, materials and equipment shall meet the required electrical codes for the Project's location. A licensed electrician shall perform all electrical work.

1.06 DESIGN CRITERIA:

A. All systems shall be designed by a professional engineer registered in the State of Michigan (Design Engineer of Record). The Contractor shall provide three (3) copies of an engineered set of drawings that includes all systems. Drawings shall include, but are not limited to; layouts of all equipment, sections, schematics, flow diagrams, equipment schedules and design information. Drawing set shall be stamped and signed by the design engineer of record.

B. Intention of this section is to provide a minimum design standard. Design-Build team to verify all conditions stated herein.

C. Operational Season: 12 months per year.

D. Seating Capacity (approximate): 500 seats

E. Existing Ice Rink Floor System: Standard NHL size ice rink floor system. Ice Rink Floor to remain in place.

F. Ice Thickness: Typically will be maintained near 1 ½” thick.

G. Refrigeration System Layout: Shall be a separate package system for the refrigeration system and separate package system for the rink pumps.

1.07 RELATED WORK BY OTHERS

A. Owner to provide data cable to the refrigeration package control system or other refrigeration system devices as required.

B. Owner to provide a qualified ice system operator, prior to start-up of systems that will operate the system after start-up.

1.08 SUBMITTALS

A. Shop Drawings. Submit full shopdrawing of refrigeration package (include layouts, cuts sheets, PID drawings, control drawings, etc.), pumps, piping, insulation, concrete mix design and other materials and equipment provided. Provide one (1) electronic copy.

B. Test Reports and Certifications. Submit one (1) electronic copy of test reports to the Engineer when specified.

C. Operation and Maintenance Manuals (O&M Manuals). Submit one (1) electronic copy for review and one (1) hard copy of O&M Manuals for Owner's final use. O&M Manuals shall include the following.

1. Three ring binders with index and tabs separating information.
2. System description including:
    a. Detailed description of controls.
    b. Detailed start-up and shut-down procedures
3. Equipment and valve information including:
    a. Approved shop drawings.
    b. Parts list, wiring diagram and other electrical information.
    c. Maintenance and operation information
    d. Trouble shooting information
    e. Current address and telephone information of manufacturers and service representatives for each piece of equipment
    f. Warranties for all equipment and systems.
4. Test reports and records
    a. Material tests for concrete, sand, glycol, etc.
    b. Pipe pressure tests for refrigeration system piping, rink floor piping, and transmission mains.
5. Certifications of inspections by regulatory agencies.
6. Record plan information of pipe routing, wiring diagrams, equipment layout, valve locations, etc.
7. Log sheet template for daily record of all refrigeration system operating parameters, set points, leak detection system and ambient air conditions.

1.09 WARRANTY/GUARANTY

A. In addition to the standard manufacturer's warranty on all equipment and materials, the contractor shall provide a standard one-year materials and labor warranty on all work performed for this project.

B. Motors and Variable Frequency Drives: In addition to the standard one-year warranty, provide start-up services from a certified manufacturer's representative to provide an additional 1-year warranty.

C. Test and maintain chemical balance of all refrigerants in all systems including inhibitors in all solutions

1.10 ALTERNATE BIDS

A. Definition: Work that is added or deducted from the Base Bid amount if the Owner decides to accept the corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

B. The cost or credit for each alternate is the net addition to, or deduction from, the Contract Sum to incorporate the alternate into the Work. No other adjustments are made to the Contract Sum.

C. Alternates may be accepted by the Owner in any order and may be used to determine the low bidder.

D. The bidder shall bid on each alternate specified as part of the specifications. Alternates not specifically requested will not be considered unless prior approval has been granted by the Engineer.

E. Description of **Alternate Bids**:

1. **Alternate Bid 1** – Remove and dispose of existing concrete equipment pad. Furnish and install new concrete equipment pad and aggregate base. See drawing and details.
2. **Alternate Bid 2** – Furnish and install 8 foot high chain line fencing around new air cooled chiller package with minimum of two (2) access gates.
3. **Alternate Bid 3** – Remove and dispose of existing 400A breaker in main distribution panel that is servicing the existing refrigeration system. Furnish and install a new 600A breaker. Verify existing electrical panel and electrical service can support this change.
4. **Alternate Bid 4** – Furnish and install insulated removable coated panels on exterior of refrigeration package to fully enclose the refrigeration package. Each panel shall be easily removable for servicing the equipment. Provide a smaller heater and lighting inside the equipment package.
5. **Alternate Bid 5** – Furnish and install temporary chiller system rental. Prorate rental rate per day of use.
6. **Alternate Bid 6** – Furnish and install permanent connection (including isolation valves, tees, etc.) in existing 8” glycol piping for temporary chiller system connection.

PART 2 - PRODUCTS

2.01 GENERAL

A. Refrigerant and Glycol Piping in Mechanical Room: All new piping shall be welded schedule 40 and 80 (where required) steel.

B. All motors shall have premium efficiency ratings. Provide solid state starters for all motors greater than 75 horsepower.

C. Furnish and install all pipe hangers, gauges, and monitoring devices as required for a complete system.

D. Furnish and install all valves and accessories to fully isolate each piece of equipment and for maintenance of the system.

E. Furnish and install insulation systems on all piping and equipment (above grade). All equipment and piping for the refrigeration package shall be insulated per the factory recommendations for exterior use. New interior piping and pumps shall be insulated using Type 5 extruded polystyrene, 1.8 lbs/cf density. Minimum 2” thickness on 1 ¼” to 8” diameter piping and 1.5” thickness on 1” diameter piping and smaller. All insulation systems on the interior of the building shall have PVC jacket, 30 mil. thick. Provide vapor barrier as required.

F. Furnish and install all sealing and fire stopping for all ice system piping through fire rated or non-rated walls.

G. Furnish and install a full charge of primary refrigerant and secondary refrigerant in all systems.

H. Furnish and install concrete equipment pad for new pumps if new pumps are installed . and equipment pads for all refrigeration and pump equipment.

2.02 REFRIGERATION ROOM

A. Furnish and install exterior door signage as required by mechanical and other codes.

2.03 REFRIGERATION SYSTEM

A. Factory assembled, single piece, industrial outdoor skid package (including air-cooled condenser) liquid chiller with dual (2) independent refrigerant circuits and integral air-cooled condenser. Contained within one-unit, cabinet shall be all factory wiring, piping, controls, refrigerant charge, and special features required prior to field start-up. Refrigeration package must be compatible with outdoor installation and operation and be fully enclosed with aluminum access panels around the entire perimeter of the unit. Alternate Bid 4 - Provide exterior insulated panels. Approved manufacturer: Zero Zone, Trane, York, Hill Phoenix, M&M Carnot, or equal.

B. Design Criteria:

1. Minimum capacity at design conditions outline in this specification shall be 80 tons.
2. Primary Refrigerant: R-513a.
3. Secondary Refrigerant: 40% ethylene glycol.
4. Glycol temperatures: 14F supply to rink floor, 17F return from rink floor.
5. Glycol flowrate: Minimum of 750 gpm supply to existing rink floor
6. Designed for 12 month operation.
7. Minimum capacity at design conditions shall be 80 tons.
8. Electrical Service:480/3/60.

C. Motor Control Panel

1. Provide a cabinet style control and electrical cabinet to house all electrical components for the refrigeration system including all starters, breakers, controls, running lights, contacts, relays, switches, fuses, safety switches, alarms, overload relays, resets, and all other electrical devices required for a fully operational ice system. The control and electrical shall include but not limited to, the following:
   a. Starters for compressors, pumps, and condenser fan.
   b. Running lights and HOA switches for all pumps, compressors, and condenser fan.
   c. Pressure controllers for condenser fan and pump cycling as manufactured by Johnson Controls or equal.
   d. Safety cutout controller for low brine or glycol temperature.
   e. Adjustable alarm contact for high return brine or glycol temperature.
   f. Hour run time meters for each compressor.
   g. Ice System Controls. See description in this section.
2. Shall be mounted to the frame of the refrigeration package. Vibration isolators and systems shall be installed to prevent vibration from refrigeration package.
3. The control and electrical cabinet shall be a Type 1 enclosure in accordance with UL 508, UL845 and shall be NEMA 3R rated for outdoors. Shall include ground lugs, disconnects with means of padlocking in lock out position, fault current rating of 42,000 amps, non-insulated equipment ground bus, and rated for 480 volts, 3 phase, 3 wire, 60 hertz electrical service. Provide plastic laminated identification nameplates on the front of the MCC panel. Finish shall be gray primer over a phosphatized surface.

4. An electrical feeder (with phase loss protection) shall be brought to a single point connection on the refrigeration package by the Contractor.

D. Controls:

1. Controls:
   a. Unit controls shall include the following minimum components:
   b. Manufacturer: Allen Bradley, Microthermal, York, Trane, or approved equal.
   c. Microprocessor with non-volatile memory. Battery backup system will not be accepted.
   d. Power and control circuit terminal blocks.
   e. ON/OFF control switch.
   f. Replaceable solid-state relay panels.
   g. Thermistor installed to measure saturated condensing temperature, cooler saturation temperature, compressor return gas temperature, and cooler entering and leaving fluid temperature.
   h. Chilled fluid thermal dispersion flow switch.
   i. System must be accessible through the web.
2. Unit controls shall include the following functions as standard:
   a. Automatic circuit lead/lag.
   b. Capacity control based on leaving chilled fluid temperature and compensated by rate of change of return-fluid temperature with temperature set point accuracy to 0.1F.
   c. Limiting the chilled fluid temperature pull-down rate at start-up to an adjustable range of 0.2F to 2.0F per minute to prevent excessive demand spikes at start-up.
   d. Seven-day time schedule.
   e. Leaving chilled fluid temperature reset from return fluid, outdoor-air temperature, space temperature, or 4 to 20 mA input. <u>Control on return fluid temperature.</u>
   f. Demand limit control with 2-stage control (0 to 100% each) or through 4 to 20 mA input (0 to 100%)
   g. Chilled and condenser water pump start/stop control.
   h. Dual chiller control for series chiller applications without addition of hardware modules or additional thermistors.
   i. Dual chiller control for parallel flow applications use one additional sensor.
   j. Amperage readout per compressor with % MTA (must trip amps) per compressor.
3. NEMA 4x housing suitable for outdoor environments. Display menus shall provide clear language descriptions of all menu items, operating modes, configuration points and alarm diagnostics. Reference to factory codes shall not be accepted. An industrial grade coiled extension cord shall allow the display module to be moved around the chiller. Magnets shall hold the display module to any sheet metal panel to allow hands-free operation. Display module shall have NEMA 4x housing suitable for use in outdoor environments. Display shall have backlight and contrast adjustment for easing viewing in bright sunlight or night conditions. The display module shall have raised surface buttons with positive tactile response.

4. The chiller controller shall include multiple connection ports for communicating with the local equipment network and the ability to access all chiller control functions from any point on the chiller.

5. The control system shall allow software upgrade without the need for new hardware modules.

6. Touchscreen controller shall have the option to be mounted on the inside wall of the existing mechanical room at the Owner’s option.

7. Furnish and install isolation valves, unions, purge valves, etc. required for isolating and servicing each piece of equipment and system components.

8. The cost of all piping, electrical, equipment, controls, or other changes required for the proper installation of all equipment shall be included in the Contractors bid.

E. Emergency Devices

1. Furnish and install an emergency remote control push/pull button (off-only control) and all associated electrical for a complete system to stop the operation of all electrically energized equipment related to the refrigeration system as required by the current state and local mechanical codes.

2. For interior devices and locations, furnish and install a clear Plexiglass protective, lockable, wall mounted case for devices.

3. For exterior devices and locations, furnish and install NEMA Type 3R, continuous hinge, lockable enclosure (Weigmann RHC121206 or equal). Emergency ventilation remote switch provided by others will also be installed by others in this enclosure. Verify enclosure space needs with ventilation contractor.

4. Provide all low voltage wiring and connections required for alarms, controls and all other related devices for complete operating systems.

F. Provide a gas monitoring system if exterior panels are used to detect primary refrigerant gas leakage in and around the chiller package. Provide a complete system including display panel, audible alarm and strobe light, sensor(s), etc. and as required by code.

2.04 RINK PUMP SYSTEM

A. If reusing the existing two pump package system, provide verification that each of the existing pumps can meet the flowrate design criteria stated in this specification for the refrigeration system package.

B. If the existing pump package does not meet the flowrate design criteria either:

1. Replace impeller, motors and all other modification necessary to meet the design criteria including any electrical modifications, or

2. Replace the pumps with new centrifugal, end suction design, single stage, base mounted pumps manufactured by B&G, Aurora or equal. New pumps shall include flexible connectors on suction and discharge of pumps, isolation valves, insulation, pressure and temperature gauges, VFDs, etc. Provide all modification necessary for this change including electrical.

3. Provide all electrical modifications necessary for these changes.

PART 3 - EXECUTION

3.01 GENERAL

A. All equipment shall be installed per manufacturer's requirements.

B. Provide motor circuits as required by NFPA 70 including a motor grounding conductor.

C. All structural supports and framing and exposed steel piping shall be painted with one coat of primer and one coat of alkyd egg-shell enamel. Owner to select colors.

D. All piping systems shall be thoroughly flushed prior to start-up.

E. All fluids shall be tested and results provided to Owner for review.

F. All piping systems shall be pressure tested. No pressure drop allowed.

G. Provide concrete testing, from an independent testing company, during concrete pour including slump and air on every truck and compressive strength test on every 50 yards of concrete placed.

H. Concrete shall be placed with a surface tolerance of +/- ¼" from true level plane.

I. Furnish and install curing compound on all concrete.

3.02 DEMOLITION

A. The Contractor is responsible for all demolition and disposal of the entire existing refrigeration system except for the existing pumping system and electrical components if being reused as noted in this specification and related drawing. Demolition includes the entire refrigeration system and all replated piping, valves, supports, electrical controls system, etc.

B. Drain fluids from all systems prior to starting demolition.

    1. Primary refrigerant.

        a. The reclamation and recovery of all refrigerants must meet the requirements outlined in Section 608 of the Clean Air Act of 1990. Contractors who recover systems containing refrigerant are required to carry a Pollution Liability Insurance Policy. The following project documentation is required. Copies of the documentation shall be submitted to the Owner.

            1) Approved reclamation contractors include Rapid Recovery (952.297.2011), Reclamation Technologies (763.785.0686), or equal.

            2) Recovery technicians EPA certification

            3) Recovery equipment certification

            4) Date of service

            5) Location of service (site name & address)

            6) Make, model and serial number of systems

            7) Type and quantity of refrigerant

            8) Comments or concerns about condition of existing system or parts of systems.

            9) Signed certificate of abatement certifying the following:

            10) An EPA certified technician was used to perform the service and complete EPA documentation as required by the EPA - Clean Air Act.

            11) EPA Certified and ARI Certified equipment was used to recover the refrigerant.

            12) The systems were recovered to EPA required levels.

13) Recovered refrigerants were transported to an EPA certified reclamation facility.

b. Dispose of the primary refrigerant off-site in accordance with all local, state and federal codes.

2. Secondary refrigerant solutions.

a. Remove all secondary fluids necessary for this work.

b. Salvage and store existing fluids for reuse. Test fluid and provide additional fluid and inhibitors as required to ensure the fluid is within the specified requirements and the manufacturers requirements.

c. Reinstall existing and adjusted ethylene glycol solution in all systems. Furnish and install additional glycol as needed to provide a full operating charge in all systems.

C. Disconnect all electrical systems prior to starting demolition. Coordinate utility service outages with the Owner and utility company since the main facility may still be in use. 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. In particular, all security and safety systems must be maintained in operation at all times as required by the Owner and local officials. This includes security and safety lighting.

D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed. Repair adjacent construction and finishes damaged during demolition and extension work.

E. Cut all buried piping, that is indicated to be abandoned, flush with finished floor unless otherwise noted. Fill all buried piping indicated to abandon in place with flowable grout. Finish floor to match existing adjacent floors.

F. All mechanical equipment, piping, valves, electrical systems and other items related to the refrigeration or ice system resulting from required demolition shall be removed and disposed of off-site by the unless specifically designated to be salvaged.

G. All disposals shall occur off-site and shall be performed in accordance with applicable authorities having jurisdiction.

H. PROTECTION: The Contractor shall be responsible for covering all electrical systems, control systems, sensitive equipment, doorways, HVAC intakes, and other areas adjacent to areas where demolition will take place with polyethylene sheeting prior to the start of demolition.

I. VENTILATION: The Contractor shall be responsible for providing proper ventilation in the arena during construction of the project and to prevent unwanted vapors or odors from reaching other parts of the facility.

3.03 CLEANING, PAINTING AND RESTORATION

A. Contractor shall be responsible for cleaning the immediate construction area where work or demolition is conducted and the mechanical rooms where work is being performed.

B. Patch and paint all holes caused or left by construction and demolition work. Match adjacent textures and colors.

C. Clean all equipment and piping to original condition after project has been completed.

D. Touch up all equipment paint, using paint provided by the manufacturer, after the installation is complete.

3.04 START-UP AND FOLLOW UP SERVICES

A. The refrigeration system shall not be started until all local and state governing authorities have inspected and provided written approval for all systems related to, and including the refrigeration, piping, controls, ventilation, ice equipment room and building and all other related systems; and all alarms and controls have been thoroughly tested for all conditions and modes of operations.

B. All tests shall be witnessed by Owner or Owner’s representatives.

C. After all piping systems have been tested according to the specifications and current codes and have been thoroughly cleaned, fill all piping systems with a complete charge of the specified primary and secondary refrigerants. Remove all free air from the systems. The contractor shall be responsible for removing air from the system throughout the warranty period of the project. The contractor shall take every precaution to fill the piping system in such a manner that results in maximum air removal and avoids trapping air in the system (for example, the ice rink floor).

D. Provide all additional primary and secondary refrigerants necessary to maintain fully charged systems throughout the warranty period of the project.

E. Provide a factory trained technician to completely check the operation of the refrigeration system and equipment and all associated systems and equipment during start up.

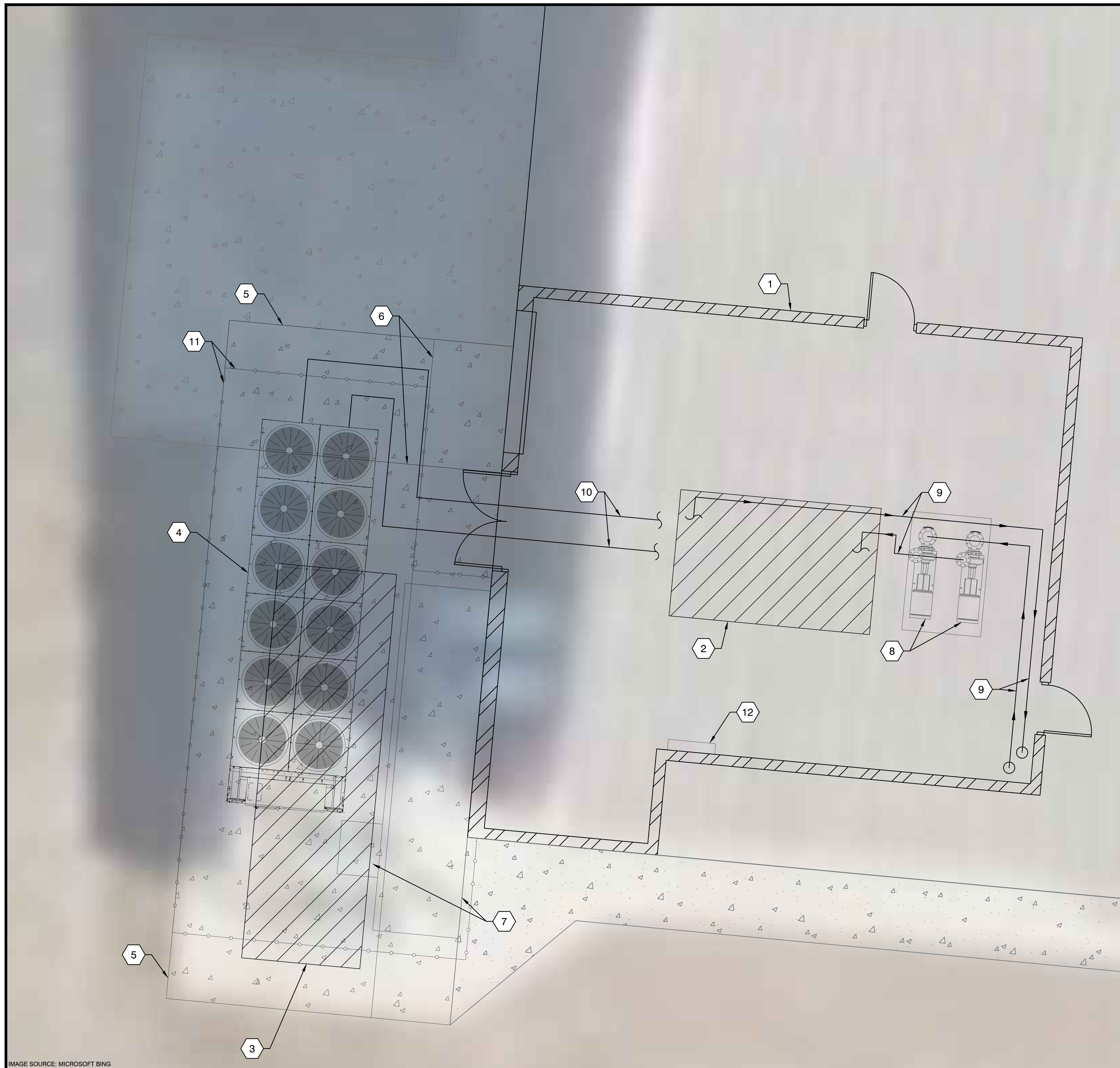
F. Provide the Owner's operating staff with four (4) hours of hands-on instructions on the safe operation of the refrigeration system.

G. Demonstrate that all control and alarm systems are working as required by code. All necessary adjustments, additions, and electrical modifications shall be made to provide these systems.

3.05 PERMITS

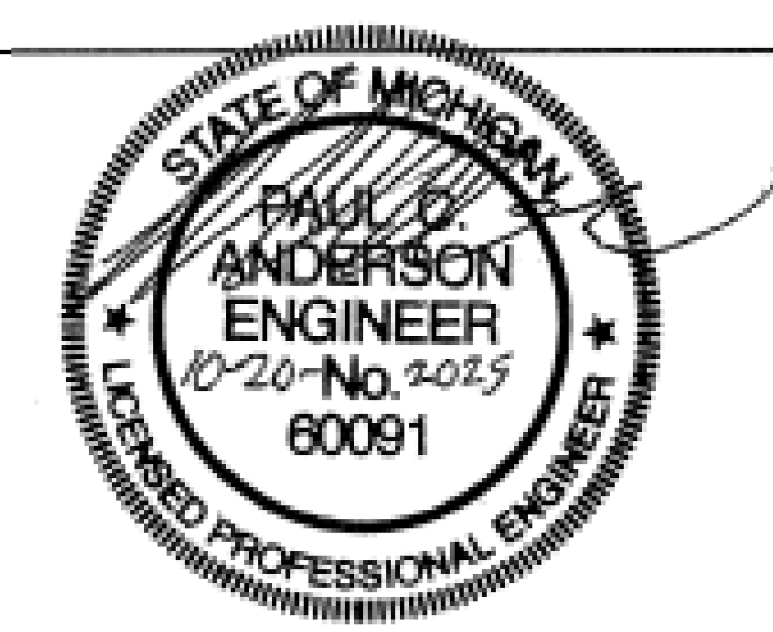
A. The contractor shall apply for and obtain all permits required to construct the project at no additional cost to the Owner unless specified otherwise.

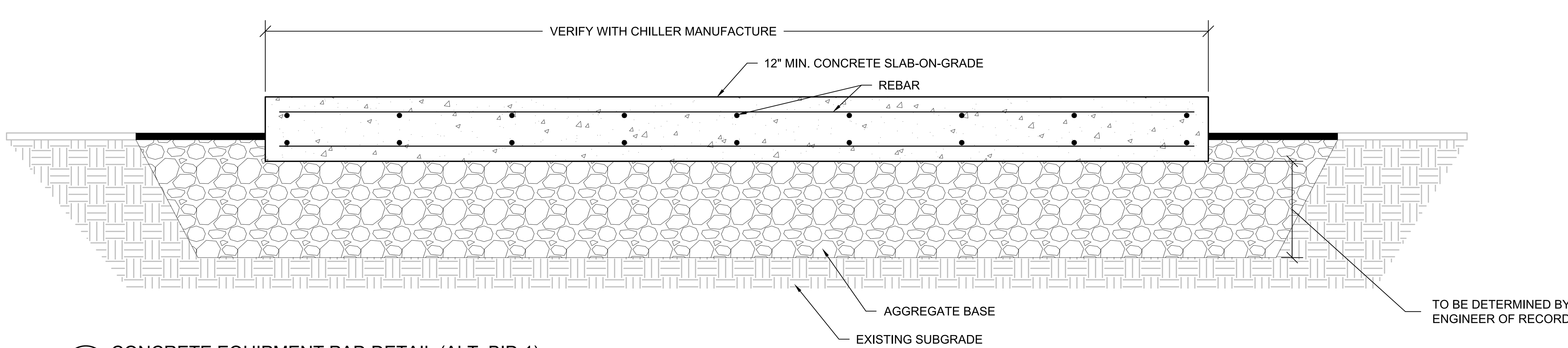
END OF SECTION



2 ICE REFRIGERATION EQUIPMENT PLAN
SCALE: 1/4" = 1'-0"

1 OVERALL SITE PLAN
SCALE: 1/32" = 1'-0"





ICE 104 CONCRETE EQUIPMENT PAD DETAIL (ALT. BID 1)
SCALE: N.T.S.

X KEY NOTES:

1. APPROXIMATE EXTENTS OF EXISTING REFRIGERATION EQUIPMENT ROOM.
2. REMOVE AND DISPOSE OF EXISTING R22 REFRIGERATION EQUIPMENT SKID PACKAGE.
3. REMOVE AND DISPOSE OF EXISTING AIR COOLED CONDENSER AND STEEL SUPPORT FRAME, PIPING, VALVES, ALL RELATED APPURTENANCES, ETC.
4. FURNISH AND INSTALL EXTERIOR AIR COOLED REFRIGERATION CHILLER PACKAGE. SEE SPECIFICATION.
5. EXISTING CONCRETE PAD TO REMAIN. **SEE ALT. BID 1.**
6. EXISTING CONCRETE EXPANSION JOINTS.
7. EXISTING MECHANICAL HVAC EQUIPMENT AND DUCTWORK TO REMAIN. DO NOT DISTURB.
8. VERIFY THAT THE EXISTING RINK GLYCOL PUMPS ARE SUITABLE FOR USE WITH THE NEW AIR-COOLED CHILLER PACKAGE. IF EXISTING PUMPS ARE NOT SUITABLE FOR USE WITH THE NEW AIR-COOLED CHILLER PACKAGE, REMOVE AND DISPOSE OF EXISTING RINK GLYCOL PUMPS, AND FURNISH AND INSTALL NEW RINK GLYCOL PUMPS.
9. EXISTING INSULATED 8" STEEL GLYCOL PIPING ROUTED OVERHEAD TO REMAIN. REMOVE AND DISPOSE OF, MODIFY, AND/OR REPLACE AS NECESSARY TO CONNECT RINK GLYCOL PUMPS TO NEW AIR-COOLED CHILLER PACKAGE AND BELOW GRADE RINK FLOOR SUPPLY AND TRANSMISSION MAINS.
10. FURNISH AND INSTALL NEW INSULATED 8" STEEL GLYCOL TRANSMISSION MAINS ROUTED OVERHEAD BETWEEN NEW AIR-COOLED CHILLER PACKAGE AND RINK GLYCOL PUMPS.
11. **SEE ALT. BID 2.**
12. EXISTING MAIN DISTRIBUTION PANEL WITH 400A BREAKER FOR EXISTING EQUIPMENT SKID PACKAGE. **SEE ALT. BID** 3.

GENERAL NOTES:

1. VERIFY DIMENSIONS OF ALL EXISTING ROOMS, EQUIPMENT, CONCRETE PADS, ETC. PRIOR TO CONSTRUCTION.
2. PIPING SHOWN IN SCHEMATIC FORM.
3. ALL PIPE SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 7'-6" BETWEEN FLOOR AND BOTTOM OF PIPE INSULATION.
4. PROVIDE ELECTRICAL AND CONTROLS FOR ALL ICE RINK EQUIPMENT AS SPECIFIED. WORK SHALL BE COMPLETED IN ACCORDANCE TO ALL APPLICABLE ELECTRICAL CODES.
5. VERIFY LOCATION OF ALL UTILITIES PRIOR TO EXCAVATION.
6. VERIFY EQUIPMENT DIMENSIONS AND LAYOUT IS ACCURATE PRIOR TO INSTALLATION. INSTALL EQUIPMENT AND VESSELS TO MAXIMIZE ACCESSIBILITY AND SERVICEABILITY.
7. CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADE CONTRACTORS FOR OVERHEAD ROUTING OF PIPES, DUCTS, ETC.
8. PATCH AND PAINT ALL HOLES LEFT BY DEMOLITION. MATCH EXISTING MATERIAL AND PAINT.

ALTERNATE BIDS:

1. REMOVE AND DISPOSE OF EXISTING CONCRETE EQUIPMENT PAD. FURNISH AND INSTALL NEW CONCRETE EQUIPMENT PAD AND AGGREGATE BASE. SEE DETAIL ICE-104.
2. FURNISH AND INSTALL 8' HIGH CHAIN LINK FENCING AROUND NEW AIR COOLED CHILLER PACKAGE AND EXISTING MECHANICAL EQUIPMENT AND DUCTWORK. MINIMUM TWO (2) ACCESS GATES
3. REMOVE AND DISPOSE OF EXISTING 400A BREAKER IN MAIN DISTRIBUTION PANEL. FURNISH AND INSTALL NEW 600A BREAKER IN EXISTING MAIN DISTRIBUTION PANEL.
4. FURNISH AND INSTALL INSULATED, REMOVABLE COATED PANELS ON EXTERIOR OF REFRIGERATION CHILLER PACKAGE
5. FURNISH A TEMPORARY CHILLER SYSTEM RENTAL. PRORATE RENTAL RATE PER DAY OF USE.
6. FURNISH AND INSTALL PERMANENT CONNECTIONS TO EXISTING 8" GLYCOL PIPING FOR TEMPORARY CHILLER SYSTEM CONNECTION

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E4972 JACKSON ROAD; IRONWOOD, MI 49938

Certification:

Drawn By:	PAF
Checked By:	SAW
Project No.	900-25-609

Revisions:

No.	Date	Description

PRELIMINARY DESIGN

OCTOBER 15, 2025

ICE REFRIGERATION EQUIPMENT PLAN

R-100

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