
City of Traverse City

Office of the City Manager

GOVERNMENTAL CENTER
400 Boardman Avenue
Traverse City, MI 49684
(231) 922-4440
(231) 922-4476 fax
tcmanage@traversecitymi.gov



October 12, 2023

Bidder:

The City of Traverse City will receive sealed bids in the Office of the City Manager, Second floor, Governmental Center, 400 Boardman Avenue, Traverse City, Michigan, 49684, until **Monday, November 6, 2023, at 10:00 a.m.** for the following:

Carnegie Center: Chiller Project
(specifications attached)

If the specifications are obtained from the City's website link at: [Bid Link](#), it is the sole responsibility of the Bidder to check the website for updates and addenda prior to the bid being submitted. Bidder may also sign up to receive notifications when bids and RFPs are posted by sending an e-mail requesting same to ksheridan@traversecitymi.gov

The City of Traverse City reserves the right to accept or reject any or all bids, waive irregularities, and to accept the bids either on an entire or individual basis that is in the best interest of the City. The City accepts no responsibility for any expense incurred by the Bidder in the preparation and presentation of a bid. Such expenses shall be borne exclusively by the Bidder. Only the successful Bidder will be notified.

You must indicate on the outside of the sealed envelope that the bid is for the **“Carnegie Center: Chiller Project.”** You must submit **TWO (2) SEALED COPIES** of the bid to the City Manager's Office prior to the above-indicated time and date or the bid will not be accepted. Alternatively, emailed bids *will be* accepted. Please indicate in the subject line of your e-mail that you are submitting a “Sealed Bid” together with the project description, “Carnegie Center: Chiller Project” and submit your e-mailed bid to tcmanage@traversecitymi.gov **before Monday, November 6, 2023 @ 10:00 a.m.**

Please note that if you have previously submitted an informal quote, you will still need to submit a sealed bid prior to the date and time specified above in order to be considered. Please ensure that all requirements listed in the specifications are met.

If you have any questions, please contact Michelle Hunt, Parks & Recreation Superintendent, at mhunt@traversecitymi.gov, or (231) 922-4900, ext. 114, before the bid is submitted.

PLEASE SUBMIT BID TO: Kim Sheridan, Purchasing Agent
City of Traverse City / City Manager's Office
400 Boardman Avenue, 2nd floor
Traverse City, MI 49684
tcmanage@traversecitymi.gov

REQUEST FOR PROPOSAL / CARNEGIE CHILLER PROJECT

BACKGROUND: The City of Traverse City is soliciting proposals for a new Chiller and equipment upgrades at the Carnegie Center, 322 Sixth Street, Traverse City, MI. The City will accept proposals from Mechanical Contractors only. Any proposals for any work other than what is described herein will be considered incomplete.

The City intends to select the qualifying contractor on the basis of qualifications, ability, relevant experience, cost, work plans and time frame, possession of required licenses and insurance and other pertinent factors. The contractor must have all required licenses and will be required to accept a service order from the City for this work. All requirements of the service order must be met, including insurance and workers' compensation insurance pursuant to Michigan state law.

SCOPE OF WORK (GENERAL):

As per the attached Addendum #1: Remove existing unit, mounting hardware, equipment, wiring, and ductwork to facilitate the installation of new unit. Furnish and install new Chiller unit to replace the existing unit. The scope will include examination, maintenance, and state required testing, of the unit generally described in the attached Addendum #1. The work shall include a fully functional and warranted item and any necessary items not mentioned shall be incidental to the work.

Reports, warranties, maintenance schedules, operation manuals, and other information shall be provided to the city in (2) two binders prior to completion of the project.

Please refer to Addendum #1 for complete RFP requirements.

Bidder - Please complete and return

BID SUMMARY

TITLE: Carnegie Center: Chiller Project

DUE DATE: November 6, 2023 @ 10:00 a.m.

Having carefully examined the attached specifications and any other applicable information, the undersigned proposes to furnish all items necessary for and reasonably incidental to the proper completion of this bid. Bidder submits this bid and agrees to meet or exceed all requirements and specifications unless otherwise indicated in writing and attached hereto.

Bidder certifies that as of the date of this bid the Company or he/she is not in arrears to the City of Traverse City for debt or contract and is in no way a defaulter as provided in Section 152, Chapter XVI of the Charter of the City of Traverse City.

Bidder understands and agrees, if selected as the successful Bidder, to accept the City's standard Purchase Order / Service Order / Contract, the terms of which are not negotiable, and to provide proof of the required insurance. A "Sample" Service Order is attached as Addendum #2.

Bidder submits this bid and agrees to meet or exceed all the City of Traverse City's requirements and specifications unless otherwise indicated in writing and attached hereto. Bidder shall comply with all applicable federal, state, local and building codes, laws, rules and regulations and obtain any required permits for this work.

The Bidder certifies that it is in compliance with the City's Nondiscrimination Policy as set forth in Administrative Order No. 47 and Chapter 605 of the City's Codified Ordinances.

The Bidder certifies that none of the following circumstances have occurred with respect to the Bidder, an officer of the Bidder, or an owner of a 25% or more share in the Bidder's business, within 3 years prior to the bid:

- (a) conviction of a criminal offense incident to the application for or performance of a contract;
- (b) conviction of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense which currently, seriously and directly reflects on the Bidder's business integrity;
- (c) conviction under state or federal antitrust statutes;
- (d) attempting to influence a public employee to breach ethical conduct standards; or

- (e) conviction of a criminal offense or other violation of other state, local, or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, which in the opinion of the City indicates that the bidder is unable to perform responsibility or which reflects a lack of integrity that could negatively impact or reflect upon the City of Traverse City, including but not limited to, any of the following offenses or violations of:
 - i. The Natural Resources and Environmental Protection Act.
 - ii. A persistent and knowing violation of the Michigan Consumer Protection Act.
 - iii. Willful or persistent violations of the Michigan Occupational Health and Safety Act.
 - iv. A violation of federal, local, or state civil rights, equal rights, or nondiscrimination laws, rules, or regulations.
 - v. Repeated or flagrant violations of laws related to the payment of wages and fringe benefits.
- (f) the loss of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.

Bidder understands that the City reserves the right to accept any or all bids in whole or part and to waive irregularities in any bid in the best interest of the City. The bid will be evaluated and awarded on the basis of the best value to the City. The criteria used by the City may include, but will not be limited to: ability, qualifications, timeframe, experience, price, type and amount of equipment, accessories, options, insurance, permits, licenses, other pertinent factors and overall capability to meet the needs of the City. The City is sales tax exempt – Government.

Bidder agrees that the bid may not be withdrawn for a period of sixty (60) days from the actual date of the opening of the bid.

BID SHEET

CARNEGIE CENTER: CHILLER UNIT

Description	Comments	Cost
Design/ Mobilization/ Permitting		
Demolition		
Installation		
Closeout		
Total		

Total Cost of Project: \$ _____

Warranty offered: _____

Expected material date: _____

Expected install date: _____

By: _____ Date: _____

Title: _____

Company: _____

Address: _____

Phone: _____

Signature: _____

Submitted by:

Signature

Company Name

Name and Title (Print)

Company Address

Phone

Fax

City,

State,

Zip

EMAIL ADDRESS: _____

Sole proprietorship/partnership/corporation

If corporation, state of corporation: _____

REFERENCES: (include name of organization, contact person, and daytime phone number).

1. _____
Contact Person: _____ Telephone: _____

2. _____
Contact Person: _____ Telephone: _____

3. _____
Contact Person: _____ Telephone: _____

SUBCONTRACTORS: (include name of organization, contact person, daytime phone number, and services to be performed).

1. _____
Contact Person: _____ Telephone: _____
Services to be Performed: _____

2. _____
Contact Person: _____ Telephone: _____
Services to be Performed: _____

3. _____
Contact Person: _____ Telephone: _____
Services to be Performed: _____



1419 Industry Drive
Traverse City, MI 49696
P 231.933.0510 | F 231.933.3215
W www.nealisengineering.com

Date: October 5, 2023

To: Parks and Recreation Superintendent
City of Traverse City
625 Woodmere Ave.
Traverse City, MI 49686

Attn: Michelle Hunt

Project: Carnegie Building

Notes By: E. Henry Toscano and Jason VanBrocklin, P.E.

The Carnegie Building has multiple existing Air Handling Units (AHU) and associated Chilled Water Supply/Return piping, Chilled Water Coils, Chiller, Boiler system, and Building Management System (BMS).

The scope of work will include replacing the existing chiller with a new chiller, new valves, glycol feeder, electrical service, spring isolation pads and interconnecting with the existing controls. The existing chiller will be demolished, and one (1) new chiller will be installed in place. The existing curb may be re-used if the new chiller footprint matches the existing curb dimensions. Chilled water piping, piping supports, and piping valves, etc. will be modified to tie into the existing chilled water system into the building. Any pipe insulation disturbed and all new piping shall be insulated and include a continuous vapor barrier. The existing glycol feeder shall be demolished due to its leak and shall be replaced by a new glycol feeder along with new fitting and piping as required to fix the leak. The new chiller shall be interconnected to the existing BMS to read entering and leaving water temperature, ambient air temperature, and have an alarm sensor. The alarm sensors are to alarm the following, but not limited to, low/high pressure alarm, no flow alarm, high/low chilled water alarm, etc. The existing electrical conduit and feeders, and local disconnecting means serving the existing chiller may be repurposed for the new chiller, while the existing 225A/3P circuit breaker in the Main Distribution Panel serving the chiller will need to be replaced with a 200A/3P circuit breaker.

END OF MEMO



nealis
ENGINEERING

1419 Industry Drive
Traverse City, MI 49696
P 231.933.0510 | F 231.933.3215
W www.nealisengineering.com

SCHEDULES

AIR COOLED CHILLER SCHEDULE

TAG	MANUFACTURER & MODEL NO.	REFRIGERANT	NOMINAL TONS	CIRCUITS	ELECTRICAL			EVAPORATOR					CONDENSER	
					VOLTAGE	MCA	MOP	EER	IPLV	ENTERING FLUID	LEAVING FLUID	DESIGN FLOW (GPM)	TOTAL PD (FT)	ENTERING FLUID
CH-1	YORK YCAL0033	R-410A	30	1	200-208V, 3Ø	152	200	10.5	15.220	54°F	44°F	68.34	11	PROPYLENE GLYCOL 40%

BASED ON YORK : QUANTECH, TRANE, DAIKIN ARE EQUALS.

MECHANICAL EQUIPMENT SCHEDULE

TAG	LOCATION	DESCRIPTION	NOTES/ ACCESSORIES
GF-1	EXISTING MECHANICAL ROOM	WESSELS GLYMATIC GLYCOL MAKE-UP PACKAGE GLYCOL MAKE-UP SYSTEM MODEL GMP-18, 18 GALLON, 1/2" NPT CONN.	110V PUMP

END OF SCHEDULES

**SECTION 236423
SCROLL WATER CHILLERS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Air-cooled scroll water chillers.

1.02 RELATED REQUIREMENTS

- A. Provide Microprocessor controlled, multiple scroll compressor, air-cooled, liquid chiller including but not limited to chiller package, charge of refrigerant and oil, electrical power and control connections, chilled liquid connections, and manufacturers start-up.

1.03 REFERENCE STANDARDS

- A. AHRI 550/590 (I-P) - Performance Rating of Water-Chilling and Heat Pump Water-Heating Packages Using the Vapor Compression Cycle 2023.
- B. ASHRAE Std 15 - Safety Standard for Refrigeration Systems 2022, with Errata (2023).
- C. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. ASHRAE Std 135 - A Data Communication Protocol for Building Automation and Control Networks 2020, with Errata (2023).
- E. Modbus (PS) - The Modbus Organization Communications Protocol. Latest Update.
- F. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate physical size, weight and location of major pieces of equipment to be installed. Notify Owner and Engineer of any major deviations from the equipment originally specified prior to ordering equipment.

1.05 SUBMITTALS

- A. Product Data: Provide rated capacities, weights, specialties and accessories, electrical requirements and wiring diagrams.
- B. Shop Drawings: Indicate components, assembly, dimensions, weights and loadings, required clearances, and location and size of field connections. Indicate equipment, piping and connections, valves, strainers, and thermostatic valves required for complete system.
- C. Manufacturer's Certificate: Certify that components furnished but not produced by manufacturer meet or exceed manufacturer's requirements.
- D. Manufacturer's Performance Data: Indicate energy input versus cooling load output from 0 to 100 percent of full load at specified and minimum condenser water temperature for water-cooled chillers and at specified and minimum outdoor air temperature for air-cooled chillers.
- E. Manufacturer's Instructions: Submit manufacturer's complete installation instructions.
- F. Sustainable Design Documentation: Submit manufacturer's product data on refrigerant used, showing compliance with specified requirements.
- G. Operation and Maintenance Data: Include start-up instructions, maintenance data, parts lists, controls, and accessories; include trouble-shooting guide.
- H. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

- B. When required, provide certification of inspection in compliance with the requirements of Authority Having Jurisdiction.
- C. Products shall be Designed, Tested, Rated and Certified in accordance with, and Installed in compliance with applicable sections of the following Standards and Codes:
 - 1. AHRI 550/590 – Water Chilling Packages Using the Vapor Compression Cycle
 - 2. AHRI 370 – Sound Rating of Large Outdoor Refrigerating and Air-Conditioning Equipment
 - 3. ANSI/ASHRAE 15 – Safety Code for Mechanical Refrigeration
 - 4. ASHRAE 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings
 - 5. ANSI/NFPA 70 – National Electrical Code (N.E.C.)
 - 6. ASME Boiler and Pressure Vessel Code, Section VIII, Division 1
 - 7. OSHA – Occupational Safety and Health Act
 - 8. Manufactured in facility registered to ISO 9001
 - 9. Conform to Intertek Testing Services for construction of chillers and provide ETL/cETL Listed Mark
- D. Factory Run Test: Chiller shall be pressure-tested, evacuated and fully charged with refrigerant and oil, and shall be factory operational run tested with water flowing through the vessel.
- E. Chiller manufacturer shall have a factory trained and supported service organization.
- F. Warranty: Manufacturer shall Warrant all equipment and material of its manufacture against defects in workmanship and material for a period of eighteen (18) months from date of shipment or twelve (12) months from date of start-up, whichever occurs first.

1.07 CHILLER MATERIALS AND COMPONENTS

- A. General: Install and commission, as shown on the schedules and plans, factory assembled, charged, and tested air cooled scroll compressor chiller(s) as specified herein. Chiller shall be designed, selected, and constructed using a refrigerant with Flammability rating of "1", as defined by ANSI/ASHRAE STANDARD - 34 Number Designation and Safety Classification of Refrigerants. Chiller shall include, but is not limited to: a complete system with a single refrigerant circuit 35 tons (123kW) and below, and not less than two refrigerant circuits above 35 tons (123kW), scroll compressors, direct expansion type evaporator, air-cooled condenser, refrigerant, lubrication system, interconnecting wiring, safety and operating controls including capacity controller, control center, motor starting components, and special features as specified herein or required for safe, automatic operation.
- B. Cabinet: External structural members shall be constructed of heavy guage, galvanized steel coated with baked on powder paint which, when subject to ASTM B117, 1000 hour, 5% salt spray test, yields minimum ASTM 1654 rating of "6".
- C. Louvered Panels (full unit): Painted steel as per remainder of unit cabinet, to protect condenser coils from incidental damage, visually screen internal components, and prevent unauthorized access to internal components. Factory installed.

1.08 COMPRESSORS

- A. Compressors: Shall be hermetic, scroll-type, including:
 - 1. Compliant design for axial and radial sealing.
 - 2. Refrigerant flow through the compressor with 100% suction cooled motor.
 - 3. Large suction side free volume and oil sump to provide liquid handling capability.
 - 4. Compressor crankcase heaters to provide extra liquid migration protection.
 - 5. Annular discharge check valve and reverse vent assembly to provide low-pressure drop, silent shutdown and reverse rotation protection.
 - 6. Initial oil charge.
 - 7. Oil level sight glass.
 - 8. Vibration isolator mouonts for compressors.
 - 9. Brazed-type connections for fully hermetic refrigerant circuits.

1.09 REFRIGERANT CIRCUIT COMPONENTS

- A. Each refrigerant circuit shall include: liquid line shutoff valve with charging port, low side pressure relief device, filter-drier, solenoid valve, sight glass with moisture indicator, thermostatic expansion valves, and flexible, closed-cell foam insulated suction line and suction pressure transducer.

1.10 HEAT EXCHANGERS

- A. Evaporator
 - 1. Evaporator shall be brazed-plate stainless steel construction, single or dual circuit heat exchangers capable of refrigerant working pressure of 650 PSIG (4482 kPa) and liquid side pressure of 150 psig (1034 kPa)
 - 2. Brazed plate heat exchangers shall be UL listed.
 - 3. Exterior surfaces shall be covered with 3.4" (19mm), flexible, closed cell insulation, thermal conductivity of 0.26k ([BTU/HR-Ft² - °F]/in.) maximum.
 - 4. Cooler shall have a factory installed thermostatically controlled heater to protect to -20°F (-29°C) ambient in off-cycle.
 - 5. Installing contractor must include accommodations in the chilled water piping to allow proper drainage and venting of the heat exchanger. A strainer with a mesh size between .5 and 1.5 mm is recommended upstream of the heat exchanger to prevent clogging.
- B. Air-cooled Condenser:
 - 1. Coils: Internally enhanced, seamless copper tubes, mechanically expanded into aluminum alloy fins with full height collars. Subcooling coil an integral part of condenser. Design working pressure shall be 450 PSIG (31 bar).
 - 2. Fans shall be dynamically and statically balanced, direct drive, corrosion resistant glass fiber reinforced composite blades molded into a low noise, full-airfoil cross section, providing vertical air discharge and low sound. Each fan in its own compartment to prevent crossflow during fan cycling. Guards of heavy gauge, PVC (polyvinylchloride) coated steel.
 - 3. Fan Motors: High efficiency, direct drive, 6 pole, 3 phase, insulation class "F", current protected, Totally Enclosed Air-Over (TEAO) , rigid mounted, with double sealed, permanently lubricated, ball bearings.

1.11 CONTROLS

- A. General: Automatic start, stop, operating, and protection sequences across the range of scheduled conditions and transients.
- B. Microprocessor Enclosure: Rain and dust tight NEMA 3R/12 (IP55) powder painted steel cabinet and gasket sealed door.
- C. Microprocessor Control Center:
 - 1. Automatic control of compressor start/stop, anti-coincidence and anti-recycle timers, automatic pumpdown at system shutdown, condenser fans, evaporator pump, evaporator heater, unit alarm contacts, and chiller operation from 0°F to 125°F (-18°C to 52°C) ambient. Automatic reset to normal chiller operation after power failure.
 - 2. Software stored in non-volatile memory, with programmed setpoints retained in lithium battery backed real-time-clock (RTC) memory for minimum 5 years.
 - 3. Forty character liquid crystal display, descriptions in English (or Spanish, French, Italian, or German), numeric data in English (or Metric) units. Sealed keypad with sections for Setpoints, Display/Print, Entry, Unit Options & clock, and On/Off Switch.
 - 4. Programmable Setpoints (within Manufacturer limits): display language; chilled liquid temperature setpoint and range, remote reset temperature range, daily schedule/holiday for start/stop, manual override for servicing, low and high ambient cutouts, low liquid temperature cutout, low suction pressure cutout, high discharge pressure cutout, anti-recycle timer (compressor start cycle time), and anti-coincident timer (delay compressor starts).

5. Display Data: Return and leaving liquid temperatures, low leaving liquid temperature cutout setting, low ambient temperature cutout setting, outdoor air temperature, English or metric data, suction pressure cutout setting, each system suction pressure, discharge pressure (optional), liquid temperature reset via a DDC or Building Automation System (by others) via a 4-20milliamp or 0-10 VDC input with optional BAS interface, anti-recycle timer status for each compressor, anti-coincident system start timer condition, compressor run status, no cooling load condition, day, date and time, daily start/stop times, holiday status, automatic or manual system lead/lag control, lead system definition, compressor starts/operating hours (each), status of hot gas valves, evaporator heater and fan operation, run permissive status, number of compressors running, liquid solenoid valve status, load & unload timer status, water pump status.
 6. System Safeties: Shall cause individual compressor systems to perform auto shut down; manual reset required after the third trip in 90 minutes. System Safeties include: high discharge pressure, low suction pressure, high pressure switch, and motor protector. Compressor motor protector shall protect against damage due to high input current or thermal overload of windings.
 7. Unit Safeties: Shall be automatic reset and cause compressors to shut down if low ambient, low leaving chilled liquid temperature, under voltage, and flow switch operation. Contractor shall provide flow switch and wiring per chiller manufacturer requirements.
 8. Alarm Contacts: Low ambient, low leaving chilled liquid temperature, low voltage, low battery, and (per compressor circuit): high discharge pressure, and low suction pressure.
- D. Manufacturer shall provide any controls not listed above, necessary for automatic chiller operation. Mechanical Contractor shall provide field control wiring necessary to interface sensors to the chiller control system.

1.12 POWER CONNECTION AND DISTRIBUTION

- A. Power Panels:
 1. NEMA 3R/12 (IP55) rain/dust tight, powder painted steel cabinets with gasket sealed outer doors. Provide main power connection(s), control power connections, compressor and fan motor start contactors, current overloads, and factory wiring.
 2. Power supply shall enter unit at a single location, be 3 phase of scheduled voltage, and connect to individual terminal blocks per compressor. Separate disconnecting means and/or external branch circuit protection (by Contractor) required per applicable local or national codes.
- B. Exposed compressor, control and fan motor power wiring shall be routed through liquid tight conduit.

1.13 ACCESSORIES AND OPTIONS

- A. Microprocessor controlled, Factory installed Across-the-Line type compressor motor starters as standard.
- B. Outdoor Ambient Temperature Control
 1. High Ambient Control (Factory Mounted): Permits unit operation above 115°F ambient.
 2. Low Ambient Control (Factory mounted): Permits unit operation to 0°F ambient. Standard unit controls to
- C. Power Supply Connections:
 1. Single Point Disconnect: Single point Non-Fused Disconnect(s) and lockable external handle (in compliance with Article 440-14 of N.E.C.) can be supplied to isolate the unit power voltage for servicing. Separate external fusing must be supplied, by others, in the incoming power wiring, which must comply with the National Electric Code and/or local codes.
- D. Control Power Transformer: Converts unit power voltage to 120-1-60 (500 VA capacity). Factory-mounting includes primary and secondary wiring between the transformer and the control panel.
- E. Pressure Transducers and Readout Capability:

1. Discharge Pressure Transducers: Permits unit to sense and display discharge pressure.
- F. Protective Chiller Panels (Factory or Field Mounted)
 1. Louvered Panels (full unit): Painted steel as per remainder of unit cabinet, to protect condenser coils from incidental damage, visually screen internal components, and prevent unauthorized access to internal components.
- G. Flow Switch (Field-mounted): Vapor proof SPDT, NEMA 3R switch, 150 PSIG (10.3 bar), -20°F to 250°F (-28.9°C to 121.1°C).
- H. Hot Gas By-Pass: Permits continuous, stable operation at capacities below the minimum step of unloading to as low as 5% capacity (depending on both the unit & operating conditions) by introducing an artificial load on the evaporator. Hot gas by-pass is installed on only one refrigerant circuit.
- I. Compressor Sound Blankets (Factory-mounted).
- J. Low speed, reduce noise fans (Factory-mounted).
- K. Vibration Isolation (Field installed):
 1. 1" Deflection Spring Isolators: Level adjustable, spring and cage type isolators for mounting under the unit base rails.

1.14 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's written installation instructions for rigging, unloading, and transporting units.
- B. Unit shall be delivered to job site fully assembled with all interconnecting refrigerant piping and internal wiring ready for field installation and charged with refrigerant and oil by the Manufacturer.
- C. Unit shall be stored and handled per Manufacturer's instructions.
- D. Protect the chiller and its accessories from the weather and dirt exposure during shipment.
- E. During shipment, provide protective covering over vulnerable components. Fit nozzles and open ends with plastic enclosures.

1.15 WARRANTY

- A. Manufacturer's Warranty: Provide minimum 1 year warranty to include coverage for materials and labor for complete assembly.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. York, a brand of Johnson Controls International, PLC; _____: www.york.com/#sle.
- B. Substitutions:
 1. The chilled water system has been designed based on specific capacities and characteristics of equipment specified in this section and other sections.
 2. When substitution of a different manufacturer or model number is desired, submit sufficient information to demonstrate to Owner and Engineer that the substitute will have the same or better performance as that specified AND that the associated equipment in the system will perform acceptably with the substitute.
 3. If the related equipment must be modified to perform acceptably with the substitute, the entity proposing the substitution is responsible for all additional costs due to re-design and provision of different related equipment.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Align chiller package on steel or concrete foundations.
- C. Install units on vibration isolators.

- D. Connect to electrical service.
- E. Connect to chilled water piping.
- F. Arrange piping for easy dismantling to permit tube cleaning and removal.
- G. Coordinate BAS, BMS, or Integrated Automation linking between unit controller(s) and remote front-end interface.
- H. General: Rig and Install in full accordance with Manufacturer's requirements, Project drawings, and Contract documents.
- I. Location: Locate chiller as indicated on drawings, including cleaning and service maintenance clearance per Manufacturer instructions. Adjust and level chiller on support structure. If equipment provided exceeds height of scheduled chiller, installing contractor is responsible for additional costs associated with extending the height of parapet or screening walls/enclosures.
- J. Components: Installing Contractor shall provide and install all auxiliary devices and accessories for fully operational chiller.
- K. Electrical: Coordinate electrical requirements and connections for all power feeds with Electrical Contractor.
- L. Controls: Coordinate all control requirements and connections with Controls Contractor.
- M. Finish: Installing Contractor shall paint damaged and abraded factory finish with touch-up paint matching factory finish.

3.02 MANUFACTURER'S FIELD SERVICES

- A. Perform factory startup of the chiller by factory trained and authorized servicing technicians confirming equipment has been correctly installed prior to equipment becoming operational and covered under the manufacturer's warranty.
- B. Supply initial charge of refrigerant and oil if not completely factory charged.
- C. Demonstrate system operations and verify specified performance.

3.03 CLOSEOUT ACTIVITIES

- A. Demonstrate proper operation of equipment to Owner's designated representative.
- B. Demonstration: Demonstrate operation of system to Owner's personnel.
 - 1. Use operation and maintenance data as reference during demonstration.
 - 2. Conduct walking tour of project.
 - 3. Briefly describe function, operation, and maintenance of each component.
- C. Training: Train Owner's personnel on operation and maintenance of system.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Provide minimum of two hours of training.
 - 3. Location: At project site.

3.04 MAINTENANCE

- A. Provide a separate maintenance contract for specified maintenance service.

END OF SECTION

**SECTION 232114
HYDRONIC SPECIALTIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Automatic flow control valves.
- B. Flow meters.
- C. Glycol system.

1.02 RELATED REQUIREMENTS

- A. Section 232113 - Hydronic Piping.

1.03 REFERENCE STANDARDS

- A. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250 2020.
- B. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard 2020.
- C. ASME B16.11 - Forged Fittings, Socket-Welding and Threaded 2021.
- D. ASME BPVC-VIII-1 - Boiler and Pressure Vessel Code, Section VIII, Division 1: Rules for Construction of Pressure Vessels 2023.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide product data for manufactured products and assemblies required for this project. Include component sizes, rough-in requirements, service sizes, and finishes. Include product description and model.
- C. Manufacturer's Installation Instructions: Indicate hanging and support methods, joining procedures.
- D. Project Record Documents: Record actual locations of flow controls.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

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

PART 2 PRODUCTS

2.01 AUTOMATIC FLOW CONTROL VALVES

- A. Manufacturers:
 - 1. Armstrong International; _____: www.armstronginternational.com/#sle.
 - 2. Bell & Gossett, a brand of Xylem, Inc; _____: www.bellgossett.com/#sle.
 - 3. Hays Fluid Controls; Mesurflo Balancing Valve: www.haysfluidcontrols.com/#sle.
 - 4. Taco Inc; _____: www.taco-hvac.com/#sle.
- B. Construction:
 - 1. Brass, bronze, or iron body with union on inlet and outlet, temperature and pressure test plug on inlet and outlet with blowdown/backflush drain.
 - 2. Built-in lug-type outlet butterfly valve with 2-position handle.

- C. Calibration: Control flow within 10 percent of selected rating, over operating pressure range of 10 times minimum pressure required for control, minimum pressure 2 psi (13.7 kPa).
- D. Control Mechanism: Provide stainless steel or nickel-plated, brass piston or regulator cup, operating against stainless steel helical or wave formed spring or elastomeric diaphragm and polyphenylsulfone orifice plate.

2.02 FLOW METERS

- A. Manufacturers:
 - 1. Dwyer Instruments, Inc; _____: www.dwyer-inst.com/#sle.
 - 2. EMCO Flow Systems; _____: www.emcoflow.com/#sle.

2.03 GLYCOL SYSTEM

- A. Manufacturers:
 - 1. American Wheatley, a company of Global Flow Products, LLC; _____: www.wheatleyhvac.com/#sle.
- B. Pump System:
 - 1. Storage: 15 gal (56.7 L) polypropylene tank with bolt-removable hinged solid cover and enamel coated carbon steel tank-stand.
 - 2. Pump:
 - a. Thermally protected 1/4 hp (0.2 kW) motor at 115 to 120 VAC, single phase rated for indoor service.
 - b. Maximum Service Operation: 100 psi (689 kPa) at 85 degrees F (29 degrees C).
 - 3. Mechanical Accessories: System isolation valves, strainer, and pressure gauges.
 - 4. Control Panel:
 - a. Fused single-point system connection rated at 115 to 120 VAC, single phase.
 - b. Interface: Hand switches with indicating lights for ON, FAULT, and LOW LEVEL.
 - c. Pressure Switch: Panel-mounted and prewired for 10 psi (69 kPa) cut-in and 40 psi (276 kPa) cut-out, adjustable.
 - d. Low Level Cut-Off Switch: Prewired to shut-down unit upon activation. Tank-side mounted.
 - 5. Pressure Relief Valve: System-mounted brass valve tubed from pump discharge side into tank with adjustable setpoint between 20 psi (138 kPa) and 150 psi (1,034 kPa).
- C. Glycol Solution:
 - 1. Water-based solution mix containing 40 percent ethylene glycol by volume required for cooling or heating system operating temperature range.
 - 2. Cooling or heating System Operating Temperature Range: Between freezing and boiling points of 3 and 220 degees F (minus 16.1 and 104.4 degees C) at 14.7 psia (101.4 kPa).

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install specialties in accordance with manufacturer's instructions.
- B. Perform tests determining strength of glycol and water solution and submit written test results.

END OF SECTION

**SECTION 232113
HYDRONIC PIPING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hydronic system requirements.
- B. Chilled water piping, above grade.
- C. Condenser water piping, above grade.
- D. Equipment drains and overflows.
- E. Pipe hangers and supports.
- F. Unions, flanges, mechanical couplings, and dielectric connections.
- G. Valves:

1.02 REFERENCE STANDARDS

- A. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300 2021.
- B. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings 2021.
- C. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings 2021.
- D. ASME B31.9 - Building Services Piping 2020.
- E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.
- F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- G. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service 2023a.
- H. ASTM B32 - Standard Specification for Solder Metal 2020.
- I. ASTM B88 - Standard Specification for Seamless Copper Water Tube 2022.
- J. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric) 2020.
- K. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120 2021a.
- L. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series) 2020.
- M. ASTM D2466 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40 2023.
- N. ASTM D2467 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 2020.
- O. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets 2020.
- P. ASTM F1476 - Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications 2007 (Reapproved 2019).
- Q. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding 2019.
- R. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2023).
- S. AWWA C606 - Grooved and Shouldered Joints 2022.
- T. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018, with Amendment (2019).

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate the installation of the chiller with size, location and installation of service utilities.
- B. Preinstallation Meeting: Conduct a preinstallation meeting prior to the start of the work of this section; require attendance by all affected installers.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data:
 - 1. Include data on pipe materials, pipe fittings, valves, and accessories.
 - 2. Provide manufacturers catalog information.
- C. Manufacturer's Installation Instructions: Indicate hanging and support methods, joining procedures.
- D. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

PART 2 PRODUCTS

2.01 HYDRONIC SYSTEM REQUIREMENTS

- A. Comply with ASME B31.9 and applicable federal, state, and local regulations.
- B. Piping: Provide piping, fittings, hangers, and supports as required, as indicated, and as follows:
 - 1. Where more than one piping system material is specified, provide joining fittings that are compatible with piping materials and ensure that the integrity of the system is not jeopardized.
 - 2. Use non-conducting dielectric connections whenever jointing dissimilar metals.
 - 3. Grooved mechanical joints may be used in accessible locations only.
 - a. Accessible locations include those exposed on interior of building, in pipe chases, and in mechanical rooms, aboveground outdoors, and as approved by Architect.
 - b. Use rigid joints unless otherwise indicated.
 - 4. Provide pipe hangers and supports in accordance with ASME B31.9 or MSS SP-58 unless indicated otherwise.
- C. Pipe-to-Valve and Pipe-to-Equipment Connections: Use flanges, unions, or grooved couplings to allow disconnection of components for servicing; do not use direct welded, soldered, or threaded connections.
- D. Valves: Provide valves where indicated:
 - 1. Provide drain valves where indicated, and if not indicated, provide at least at main shut-off, low points of piping, bases of vertical risers, and at equipment. Use 3/4 inch (20 mm) gate valves with cap; pipe to nearest floor drain.

2.02 CHILLED WATER PIPING, ABOVE GRADE

- A. Steel Pipe: ASTM A53/A53M, Schedule 40, black; using one of the following joint types:
 - 1. Welded Joints: ASTM A234/A234M, wrought steel welding type fittings; AWS D1.1/D1.1M welded.
 - 2. Threaded Joints: ASME B16.3, malleable iron fittings.

3. Grooved Joints: AWWA C606 grooved pipe, fittings of same material, and mechanical couplings.
- B. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), hard drawn; using one of the following joint types:
 1. Solder Joints: ASME B16.18 cast brass/bronze or ASME B16.22, solder wrought copper fittings.
 - a. Solder: ASTM B32 lead-free solder, HB alloy (95-5 tin-antimony) or tin and silver.
 - b. Braze: AWS A5.8M/A5.8 BCuP copper/silver alloy.
 2. Grooved Joints: AWWA C606 grooved tube, fittings of same material, and copper-tube-dimension mechanical couplings.
 3. Tee Connections: Mechanically extracted collars with notched and dimpled branch tube.
- C. PVC Pipe: ASTM D1785, Schedule 40, or ASTM D2241, SDR 21 or 26.
 1. Fittings: ASTM D2466 or ASTM D2467, PVC.
 2. Joints: Solvent welded in accordance with ASTM D2855.

2.03 EQUIPMENT DRAINS AND OVERFLOWS

- A. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), drawn; using one of the following joint types:
 1. Solder Joints: ASME B16.18 cast brass/bronze or ASME B16.22 solder wrought copper fittings; ASTM B32 lead-free solder, HB alloy (95-5 tin-antimony) or tin and silver.
 2. Grooved Joints: AWWA C606 grooved pipe, fittings of same material, and mechanical couplings.
- B. PVC Pipe: ASTM D1785, Schedule 40, or ASTM D2241, SDR 21 or 26.
 1. Fittings: ASTM D2466 or D2467, PVC.
 2. Joints: Solvent welded in accordance with ASTM D2855.

2.04 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.
 1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
 2. Hangers for Pipe Sizes 1/2 to 1-1/2 Inches (13 to 38 mm): Malleable iron, adjustable swivel, split ring.
 3. Hangers for Cold Pipe Sizes 2 Inches (50 mm) and Greater: Carbon steel, adjustable, clevis.
 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 5. Vertical Support: Steel riser clamp.
 6. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 7. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- B. In grooved installations, use rigid couplings with offsetting angle-pattern bolt pads or with wedge-shaped grooves in header piping to permit support and hanging in accordance with ASME B31.9.
- C. Rooftop Supports for Low-Slope Roofs: Steel pedestals with bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with support fixtures as specified; and as follows:
 1. Bases: High-density polypropylene.
 2. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
 3. Steel Components: Stainless steel or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
 4. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports; corrosion-resistant material.
 5. Height: Provide minimum clearance of 6 inches (150 mm) under pipe to top of roofing.

2.05 UNIONS, FLANGES, MECHANICAL COUPLINGS, AND DIELECTRIC CONNECTIONS

- A. Unions for Pipe of 2 Inches (50 mm, DN) and Less:
 - 1. Ferrous Piping: 150 psi (1034 kPa) brass or malleable iron, threaded.
 - 2. Copper Pipe: Bronze, soldered joints.
- B. Flanges for Pipe 2 Inches (50 mm, DN) and Greater:
 - 1. Ferrous Piping: 150 psig (1034 kPa) forged steel, slip-on.
 - 2. Copper Piping: Bronze.
 - 3. Gaskets: 1/16 inch (1.6 mm) thick, preformed neoprene.
- C. Mechanical Couplings for Grooved and Shouldered Joints: Two or more curved housing segments with continuous key to engage pipe groove, circular C-profile gasket, and bolts to secure and compress gasket.
 - 1. Dimensions and Testing: In accordance with AWWA C606.
 - 2. Mechanical Couplings: Comply with ASTM F1476.
 - 3. Bolts and Nuts: Hot dipped galvanized or zinc-electroplated steel.
 - 4. When pipe is field grooved, provide coupling manufacturer's grooving tools.

PART 3 EXECUTION

3.01 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Prepare pipe for grooved mechanical joints as required by coupling manufacturer.
- C. Remove scale and dirt on inside and outside before assembly.
- D. Prepare piping connections to equipment using jointing system specified.
- E. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.
- F. After completion, fill, clean, and treat systems.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.
- C. Route piping in orderly manner, parallel to building structure, and maintain gradient.
- D. Install piping to conserve building space and to avoid interference with use of space.
- E. Group piping whenever practical at common elevations.
- F. Slope piping and arrange to drain at low points.

END OF SECTION

**SECTION 230719
HVAC PIPING INSULATION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Piping insulation.
- B. Flexible removable and reusable blanket insulation.
- C. Weather barrier coatings.
- D. Jacketing and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 232113 - Hydronic Piping: Placement of hangers and hanger inserts.

1.03 REFERENCE STANDARDS

- A. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus 2019.
- B. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus 2021.
- C. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation 2022a.
- D. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications 2013 (Reapproved 2019).
- E. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel 2008 (Reapproved 2023).
- F. ASTM D610 - Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces 2008 (Reapproved 2019).
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- H. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2022a, with Editorial Revision (2023).
- I. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

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

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER, FLEXIBLE

- A. Manufacturers:
- B. Insulation: ASTM C553; flexible, noncombustible blanket.

1. K (Ksi) Value: 0.36 at 75 degrees F (0.052 at 24 degrees C), when tested in accordance with ASTM C518.
- C. Vapor Barrier Jacket:
 1. Moisture Vapor Permeability: 0.02 perm inch (0.029 ng/(Pa s m)), when tested in accordance with ASTM E96/E96M.
 2. Secure with pressure-sensitive tape.
- D. Outdoor Vapor Barrier Mastic:
- E. Tie Wire: Annealed steel, 16 gauge, 0.0508 inch diameter (1.29 mm diameter).

2.03 GLASS FIBER, RIGID

- A. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
- B. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible, with wicking material to transport condensed water to the outside of the system for evaporation to the atmosphere.
- C. Insulation: ASTM C547 and ASTM C795; semi-rigid, noncombustible, end grain adhered to jacket.
- D. Vapor Barrier Jacket: White kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches (0.029 ng/(Pa s m)).
- E. Tie Wire: 0.048 inch (1.22 mm) stainless steel with twisted ends on maximum 12 inch (300 mm) centers.
- F. Vapor Barrier Lap Adhesive: Compatible with insulation.
- G. Outdoor Vapor Barrier Mastic: Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.

2.04 WEATHER BARRIER COATINGS

- A. Weather-Resistive Barrier Coating: Fire-resistive, UV resistant, water-based mastic for use over closed cell polyethylene and polyurethane foam insulation; applied with glass fiber or synthetic reinforcing mesh.
 1. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A, when tested in accordance with ASTM E84.
 2. Water Vapor Permeance: Greater than 1.0 perm (57 ng/(Pa s m)) in accordance with ASTM E96/E96M.

2.05 ACCESSORIES

- A. General Requirements:
 1. Furnish compatible materials which do not contribute to corrosion, soften, or otherwise attack surfaces to which applied, in either the wet or dry state.
 2. Comply with ASTM C795 requirements for materials to be used on stainless steel surfaces.
 3. Supply materials that are asbestos free.
- B. Corrosion Inhibitors:
 1. Corrosion Control Gel:
 - a. Corrosion Protection: Comply with ASTM B117 and ASTM D610.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 INSTALLATION

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

- B. Exposed Piping: Locate insulation and cover seams in least visible locations.
- C. Insulated Pipes Conveying Fluids Below Ambient Temperature:
 - 1. Insulate entire system, including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
- D. Glass Fiber Insulated Pipes Conveying Fluids Below Ambient Temperature:
 - 1. Provide vapor barrier jackets, factory-applied or field-applied; secure with self-sealing longitudinal laps and butt strips with pressure-sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
 - 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
- E. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet (3 meters) above finished floor): Finish with canvas jacket sized for finish painting.
- F. Exterior Applications: Provide vapor barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal piping. Provide two coats of UV resistant finish for flexible elastomeric cellular insulation without jacketing.

END OF SECTION

SAMPLE

ADDENDUM #2

CITY OF TRAVERSE CITY
VENDOR AGREEMENT

THIS AGREEMENT made this _____ day of _____, 20____, by and between the CITY OF TRAVERSE CITY, a Michigan municipal corporation, of 400 Boardman, Traverse City, Michigan, 49684, (the "City"), and _____, a (sole proprietorship/partnership/corporation) of _____, (if a corporation, state of incorporation) (the "Vendor");

WHEREAS, the City desires to engage the services of the Vendor to furnish technical and professional assistance concerning the project which is described as:

[BRIEF DESCRIPTION OF PROJECT]

and the Vendor wishes to furnish such technical and professional service to the City and has represented that the Vendor has the education, expertise, capability and the necessary licenses to perform such services;

THEREFORE, the parties mutually agree as follows:

1. Agreement Documents. The following shall be deemed to be a part of this Agreement and incorporated herein.
 - A. Notice
 - B. Request for Proposals/Bids
 - C. Vendor's Proposal/Bid
 - D. Schedule of Payments
 - E. Timetable for Activities
2. Scope of Services. The Vendor shall provide services in accordance with and as set forth in the Agreement documents.
3. Compensation and Method of Payment. The City shall pay to the Vendor and the Vendor agrees to accept as full compensation for services under this Agreement the total sum of \$ _____ in accordance with the Schedule of Payments.
4. Period of Performance. The services to be rendered under this Agreement shall commence within _____ working days of execution hereof. Performance shall be in accordance with the Timetable for Activities.
5. Independent Contractor. The relationship of the Vendor to the City is that of an independent contractor and in accordance therewith, the Vendor covenants and agrees to conduct
[Type text]

itself consistent with such status and that neither it nor its employees, officers or agents will claim to be an officer, employee or agent of the City or make any claim, demand or application to or for any rights or privileges applicable to any officer or employee of same, including but not limited to worker's compensation coverage, unemployment insurance benefits, social security coverage, or retirement membership or credit. The parties do not intend the services provided by the Vendor to be a joint venture.

6. The Vendor's Responsibility. The Vendor shall perform the work in a good and workmanlike manner and assumes the risk in performing under this Agreement. The Vendor shall be solely responsible and answerable in damages for all improper work, accidents or injuries to person or property.

7. Recovery of Money. Whenever, under this Agreement, any sum of money shall be recoverable from or payable by the Vendor to the City, the same amount may be deducted from any sum due to the Vendor under this Agreement or under any other contract between the Vendor and the City. The rights of the City are in addition and without prejudice to any other right the City may have to claim the amount of any loss or damage suffered by the City on account of the acts or omissions of the Vendor.

8. Disclosure by City Commissioner. Pursuant to 1968 Public Act 317, a City Commissioner with a pecuniary interest in a business submitting a bid for which the City may enter into a contract or issue a service/purchase order is required to publicly disclose their pecuniary interest prior to awarding the contract or issuing the service/purchase order. A form is provided and should be included with the bid.

9. Indemnity. The Vendor shall indemnify and save harmless the City, its officers, agents and employees from and against any and all claims, liabilities, losses, damages, actual attorney fees and settlement expenses arising from bodily injury or death of any persons and damage or loss of any property resulting or arising out of or in connection with the willful or negligent acts, omissions, or errors of the Vendor or its employees, agents, servants and subcontractors. Losses include damages the City may sustain as a result of the failure of the Vendor to comply with the provisions of this Agreement. The Vendor shall not be obligated to indemnify the City for the City's own negligence. This indemnification provision shall not be limited by reason of insurance coverage of any type. This provision is not intended to waive the defense of governmental immunity that may be asserted by the City in an action against them.

The City hereby reserves the right to select its own counsel, in defense of any matter arising hereunder, and no payment or acknowledgment of liability, loss, fine, penalty or charge shall be made against the City without its express written consent. This indemnity shall survive the expiration and termination of this Agreement. However, this survival shall be no longer than the expiration of the applicable statute of limitation.

The Vendor expressly acknowledges and agrees that this indemnification provision is intended to be as broad and inclusive as is permitted by law and that if any portion thereof is held invalid, it

is agreed that the balance shall, notwithstanding, continue in full legal force and effect. This provision shall survive the termination of this Agreement.

USED WHEN CITY IS NAMED AS ADDITIONAL INSURED:

10. Insurance. The Vendor agrees not to change and agrees to maintain the following insurance throughout the period of performance of this Agreement. The Vendor will upon execution of this Agreement provide a certificate of insurance to the City Clerk. The policy shall contain endorsements stating that at least a 10-day notice will be given to the City prior to termination or any change in the policy; and in the case where Vendor is required to name the City as additional insured, and shall provide an endorsement stating that the City has been named as an additional insured onto such policy for all claims arising out of the Vendor's work. Should any required insurance be cancelled, materially reduced or expired, all activities under this Agreement shall immediately cease until substitute insurance in compliance with all requirements hereof has been procured and evidence thereof presented to the City. Upon request by the City Clerk, Vendor shall provide a full copy of any insurance policy for insurance coverage required under this agreement within ten (10) days of request. This time frame may be extended by the City Clerk in cases where the policy has not been issued.

USED WHEN CITY IS NOT NAMED AS ADDITIONAL INSURED:

10. Insurance. The Vendor agrees not to change and agrees to maintain the following insurance throughout the period of performance of this Agreement. The Vendor will upon execution of this Agreement provide a certificate of insurance to the City Clerk. The policy shall contain endorsements stating that at least a 10-day notice will be given to the City prior to termination or any change in the policy. Should any required insurance be cancelled, materially reduced or expired, all activities under this Agreement shall immediately cease until substitute insurance in compliance with all requirements hereof has been procured and evidence thereof presented to the City. Upon request by the City Clerk, Vendor shall provide a full copy of any insurance policy for insurance coverage required under this agreement within ten (10) days of request. This time frame may be extended by the City Clerk in cases where the policy has not been issued.

A. Commercial General Liability. The Vendor shall acquire and maintain commercial general liability insurance coverage in the amount of \$1,000,000 per occurrence with the City being named as additional insured for all claims arising out of the Vendor's work, including completed operations coverage (if required in the Request for Proposals/Bids). For contracts in excess of TWO HUNDRED FIFTY THOUSAND DOLLARS (\$250,000), the Vendor shall provide ISO general aggregate endorsement CG 25 03 which provides a project specific aggregate of \$2 million for general liability.

B. Workers Compensation. The parties shall maintain suitable workers compensation insurance pursuant to Michigan law and the Vendor shall provide a certificate of insurance or copy of state approval for self insurance to the City Clerk upon

execution of this Agreement.

11. Compliance with Regulations. The Vendor shall comply with all applicable statutes, rules and regulations of all federal, state and local governments and agencies having jurisdiction, and bears the risk of any such authorities or changes thereto.

12. Standard of Conduct. The Vendor shall render all services under this Agreement according to generally accepted professional practices for the intended use of the work or project.

13. The City's Obligation. The City shall provide the Vendor with all information currently available to the City upon request of the Vendor. The City Manager shall designate a City employee to be the City's representative for purposes of this Agreement.

14. Non-Discrimination. The parties agree 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 their actual or perceived race, color, religion, national origin, sex, age, height, weight, marital status, physical or mental disability, family status, sexual orientation, or gender identity. Breach of this covenant may be regarded as a material breach of this Agreement.

15. Prohibition Against Assignment. This Agreement is intended to secure the service of the Vendor because of its ability and reputation and none of the Vendor's duties under this Agreement shall be assigned, subcontracted, or transferred without the prior written consent of the City Manager. Any assignment, subcontract or transfer of the Vendor's duties under this Agreement must be in writing.

16. Third Party Participation. The Vendor agrees that despite any subcontract entered into by the Vendor for execution of activities or provision of services related to the completion of this project, the Vendor shall be solely responsible for carrying out the project pursuant to this Agreement. The Vendor shall specify in any such subcontract that the subcontractor shall be bound by this Agreement and any other requirements applicable to the Vendor in the conduct of the project unless the City Manager and the Vendor agree to modification in a particular case. The Vendor shall not subcontract unless agreed upon in writing by the City.

17. Third Party Beneficiaries. This Agreement confers no rights or remedies on any third party, other than the parties to this Agreement and their respective successors and permitted assigns.

18. Interest of the Vendor. The Vendor represents that its officers and employees have no interest and covenant that they will not acquire any interest direct or indirect, which would conflict in any manner or degree with the performance of the Vendor's services and duties hereunder. The Vendor further covenants that in the performance of this Agreement, no person having any such interest shall be employed. The Vendor further covenants that neither it nor any

of its principals are in default to the City.

19. Covenant Against Contingent Fees. The Vendor warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon any agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees. For breach of violation of this warranty, the City shall have the right to annul this Agreement without liability, or in its discretion, to deduct from this Agreement price or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

20. Qualifications of the Vendor. The Vendor specifically represents and agrees that its officers, employees, agents and contractors have and shall possess the experience, knowledge, and competence necessary to qualify them individually for the particular duties they perform hereunder.

21. Notice. Whenever it is provided in this Agreement that a notice or other communication is to be given or directed to either party, the same shall be given or directed to the respective party at its address as specified in this Agreement, or at such other address as either party may, from time to time, designate by written notice to the other.

22. Amendments. This Agreement may be modified from time to time, but such modifications shall be in writing and signed by both parties.

23. Termination.

A. For Fault. If the City Manager determines that the Vendor has failed to perform or will fail to perform all or any part of the services, obligations, or duties required by this Agreement, the City Manager may terminate or suspend this Agreement in whole or in part upon written notice to the Vendor specifying the portions of this Agreement and in the case of suspension shall specify a reasonable period not more than thirty (30) days nor less than fifteen (15) days from receipt of the notice, during which time the Vendor shall correct the violations referred to in the notice. If the Vendor does not correct the violations during the period provided for in the notice, this Agreement shall be terminated upon expiration of such time. Upon termination, any payment due the Vendor at time of termination may be adjusted to cover any additional costs occasioned the City by reason of the termination. This provision for termination shall not limit or modify any other right to the City to proceed against the Vendor at law or under the terms of this Agreement.

B. Not for Fault. Whenever the City Manager determines that termination of this Agreement in whole or in part is in the best interest of the City or in the event that termination is required by any state or federal agency, the City Manager may terminate this Agreement by written notice to the Vendor specifying the services terminated and the effective date of such termination. Upon termination, the Vendor shall be entitled to and

the City shall pay the costs actually incurred in compliance with this Agreement until the date of such termination.

24. Force Majeure. If because of force majeure, either party is unable to carry out any of its obligations under this Agreement (other than obligations of such party to pay or expend money for or in connection with the performance of this Agreement), and if such party promptly gives to the other party concerned written notice of such force majeure, then the obligations of the party giving such notice will be suspended to the extent made necessary by such force majeure and during its continuance, provided the effect of such force majeure is eliminated insofar as possible with all reasonable dispatch. "Force Majeure" means unforeseeable events beyond a party's reasonable control and without such party's fault or negligence, including, but not limited to, acts of God, acts of public enemy, acts of the federal government, acts of another party to this Agreement, fire, flood, inclement weather, epidemic, quarantine restrictions, strikes and embargoes, labor disturbances, the unavailability of raw materials, legislation, charter amendments or referendum, orders or acts of civil or military authority, injunctions, or other causes of a similar nature which wholly or substantially prevent performance. If the suspension of work lasts for more than 30 days, the City may terminate this Agreement.

25. Delay. If the Vendor is delayed in the completion of the work due to force majeure or otherwise, the time for completion may be extended for a period determined by the City in its sole discretion to be equivalent to the time of such delay. The City may terminate this Agreement if the delay lasts for more than 30 days. Upon termination by the City, the Vendor shall be entitled to the costs actually incurred in compliance with this Agreement less any costs incurred by the City as a result of the delay until the date of such termination, but not more than the maximum Agreement amount.

26. Interpretation. This Agreement shall be governed by the laws of the State of Michigan, both as to interpretation and performance. This Agreement was drafted at the joint direction of the parties. The pronouns and relative words used herein are written in the neuter and singular. However, if more than one person or entity joins in this Agreement on behalf of the Vendor, or if a person of masculine or feminine gender joins in this Agreement on behalf of the Vendor, such words shall be interpreted to be in the plural, masculine or feminine as the sense requires. In the event that any term, clause or provision of this Agreement conflicts with any term, clause, or provision contained in any attachments to this Agreement, this Agreement's terms shall prevail.

27. Venue. Any and all suits for any and every breach of this Agreement may be instituted and maintained in any court of competent jurisdiction in the County of Grand Traverse, State of Michigan.

28. Dispute Resolution. If any party has a dispute with another regarding the meaning, operation, or enforcement of any provision of this Agreement, the disputing parties agree to meet and confer to negotiate a resolution of the dispute. They further agree as follows:

A. Mediation. If they are unable to resolve the dispute themselves and before formally instituting any other dispute mechanism, they shall utilize the services of a mutually acceptable neutral mediator, who meets the qualifications of MCR 2.411, to bring them together in at least one mediation session.

B. Arbitration. If they are unable to resolve the dispute through mediation, it shall be decided by final and binding arbitration according to the rules and procedures of Michigan's Uniform Arbitration Act being PA 371 of 2012, MCL 691.1681 et seq or as otherwise agreed to by the parties. The parties shall mutually agree to the selection of an arbitrator and if they are unable to agree, the arbitrator shall be appointed by the chief judge of the 13th Circuit Court. Judgment upon the arbitrator's award may be entered in Grand Traverse County Circuit Court.

C. Venue. All meetings, hearings and actions to resolve the dispute shall be in Grand Traverse County.

D. Notice. Written notice of a claim shall be given to the other party not later than 90 days after the occurrence giving rise to the dispute becomes known or should have become known. Negotiations and mediation shall occur within 60 days after such notice. Unless a longer time is agreed upon, arbitration must be demanded within 120 days after such notice and, if not, the claim is deemed waived. Arbitration must be demanded within this time limit even if negotiation or mediation has not occurred, but the arbitrator must require the parties to participate in at least one mediation session before issuing an award.

29. Reuse of Documents. All documents and electronic files delivered to the City are instruments of service in respect of the project. Nevertheless, all documents and electronic files delivered to the City shall become property of the City upon completion of the work and payment in full of all monies due the Vendor. Copies of the City-furnished data that may be relied upon by the Vendor are limited to the printed copies (also known as hard copies) that are delivered to the Vendor. Files on electronic media of text, data or graphics or of other types that are furnished by the City to the Vendor are only for convenience of the Vendor. Any conclusion of information obtained or derived from such electronic files will be at the user's sole risk. Economic benefit to the City for having these files is predicated on the files being media form, software release number and hardware operating system number as utilized by the Vendor. Copies of documents that may be relied upon by the City are limited to the printed copies (also known as hard copies) that are signed or sealed by the Vendor. Files on electronic media of text, data or graphics or of other types that are furnished by the Vendor to the City shall be in a compatible software format for use by the City. Any conclusions or information obtained or derived from such electronic files will be at the user's sole risk. Electronic file copies of drawings will not contain the Vendor's seal or the identification of the Vendor in the title block.

30. Freedom of Information Act. The Vendor acknowledges that the City may be required from time to time to release records in its possession by law. The Vendor hereby gives permission to the City to release any records or materials received by the City as it may be requested to do so as permitted by the Freedom of Information Act, MCL 15.231 *et seq.* Provided, however, that the Vendor shall not be held liable for any reuse of the documents prepared by the Vendor under this Agreement for purposes other than anticipated herein.

31. Digital Signatures. The parties hereto acknowledge and agree under the Uniform Electronic Transactions Act, MCL 450.832, *et seq.* that this Agreement may be executed with the electronic signature of any person authorized and required to sign on behalf of the parties hereto.

32. Execution in Counterparts. This Agreement may be executed in counterparts, each of which shall be an original and all of which shall constitute the same instrument.

33. No Waiver. No waiver by any party of any default by another party in the performance of any portion of this Agreement shall operate or be construed as a waiver of any future default, whether like or different in character.

34. Entire Agreement. This Agreement, together with all items incorporated herein by reference, constitutes the entire agreement of the parties and there are no valid promises, conditions or understandings which are not contained herein. It is understood that should the Vendor recommend further work concerning the project, the City is under no obligation to engage the Vendor in such work.

35. Authority to Execute. The parties agree that the signatories appearing below have the authority and are duly authorized to execute this Agreement on behalf of the party to this Agreement.

36. Iran Economic Sanctions Act. The Vendor certifies that it is not an Iran linked business as defined under the Iran Economic Sanctions Act (MCL 129.311 *et seq*) and will not, during the performance of this Contract, violate the provisions of the Iran Economic Sanctions Act, as amended.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the date and year first above written.

CITY OF TRAVERSE CITY

By _____
_____, Mayor

By _____
Benjamin C. Marentette, City Clerk

VENDOR

APPROVED AS TO SUBSTANCE:

Liz Vogel, City Manager

APPROVED AS TO FORM:

Lauren Tribble-Laucht, City Attorney

By _____
Signature

Name and Title (print or type)

SAMPLE

SCOPE OF SERVICES

[Request for Proposals/Bids and the Vendor's Proposal/Bid inserted here]

SAMPLE

SCHEDULE OF PAYMENTS

Payments may be made to the Vendor after satisfactory service and upon receipt of a valid invoice approved by the City.

Final payment shall be made upon completion of all the Vendor's services. Total payment including expenses shall be \$_____.

SAMPLE

TIMETABLE FOR ACTIVITIES

The Vendor's services shall commence within ____ working days after execution of this Agreement. The schedule of activities shall follow the City's Request for Proposals/Bids and the Vendor's Proposal/Bid attached hereto and incorporated herein by reference.

Services shall be completed not later than _____.

SAMPLE