CITY of NOVI CITY COUNCIL

Agenda Item D
February 27, 2017

SUBJECT: Approval to award the Ice Arena Evaporative Condenser tower replacement project to Serv-Ice Refrigeration., the low bidder, in the amount of $93,175.

SUBMITTING DEPARTMENT: PRCS; IT-FM

CITY MANAGER APPROVAL:

EXPENDITURE REQUIRED	**$93,175**
AMOUNT BUDGETED	**$95,000**
APPROPRIATION REQUIRED	**None**
LINE ITEM NUMBER	**590-000.00-969.017**

BACKGROUND INFORMATION:

The existing Ice Arena Evaporative Condenser tower is approaching the end of its useful life. The costs of operation and repairs are increasing. New machines provide a more energy efficient operation of the refrigeration plant. The more efficient the refrigeration plant operates, the better the ice quality will be.

The scope calls for the replacement of the existing EVAPCO ATC-370 cooling tower with a new energy efficient unit that is attached in the specifications. The existing unit was installed in 1998 and is currently working in fair condition. The cooling tower cools and condenses the hot ammonia gas back into a liquid to be used in the refrigeration process. Compressors will not run without a properly working cooling tower. Ice cannot be made without all phases of the refrigeration system operating correctly.

The Invitation for Bids for the Novi Ice Arena Evaporative Condenser tower replacement project was posted on the Michigan Intergovernmental Trade Network (MITN) website. A mandatory pre-bid meeting was held on site on January 26th, 2017 which was attended by seven firms. We received three bids in response to the Invitation for Bids.

RECOMMENDED ACTION: Approval to award the Ice Arena Evaporative Condenser tower replacement project to Serv-Ice Refrigeration., the low bidder, in the amount of $93,175.

CITY OF NOVI
Ice Arena Evaporative Condenser Tower Replacement
February 15, 2017 11:00 A.M.

	Serv-Ice Refrigeration	Tech Mechanical	Miller-Boldt
A. Evaporative condenser Tower Replacement	**$ 93,175**	**$ 95,000**	**$ 115,000**
Make/Model proposed	BAC PCC-0214-0718N20	Baltimore Air Coil PCC-0214-0718N020	Baltimore Air Coil PCC-0214-0718N020
Lead time for equipment (ARO)	6 weeks	8 weeks	8 weeks
Days required to perform the work	one day for change out	1 day/24 hours	2 days
Manufacturer's Warranty	one year	three years parts & labor	3 years parts & labor
Labor Warranty	one year	one year	1 year labor warranty on piping & subcontract work
Exceptions		none	without exceptions
Comments		none	
Acknowledged Addenda 1 & 2	Yes	Yes	Yes
Bid bond included?	Yes	Yes	Yes

ORIGINAL

CITY OF NOVI

NOVI ICE ARENA –
EVAPORATIVE CONDENSER TOWER REPLACEMENT

BID FORM

We, the undersigned as bidder, propose to furnish to the City of Novi, according to the specifications, terms, conditions and instructions attached hereto and made a part thereof:

A. Evaporative Condenser Tower Replacement **$** 93,175.00 **Lump Sum**

Make/Model proposed BAC PCC-0214-0718N20

Lead Time for Equipment (after receipt of order): 6 weeks

Days required to perform the work: one day for change out

Manufacturer's Warranty one-year

Labor Warranty one-year

We acknowledge receipt of the following Addenda: No #1, No #2
(please indicate numbers)

EXCEPTIONS TO SPECIFICATIONS (all exceptions must be noted here):

COMMENTS:

REFERENCES: Please provide at least three client (3) references for projects of similar scope done in the last 3 years.

Company USA Arena

Address 14900 Beck Road Plymouth, Mi 48170

Phone 734-558-3083 Contact name Tony Noble

Company Kensington Valley Ice House

Address 10540 Citation Dr. Brighton, MI 48116

Phone 248-798-5536 Contact name Jim Sokol

Company Michigan State University-Munn Arena

Address 1 Chestnut Road East Lansing, MI 48824

Phone 517-432-4121 Contact name Tom Campbell

NON-IRAN LINKED BUSINESS

By signing below, I certify and agree on behalf of myself and the company submitting this proposal the following: (1)that I am duly authorized to legally bind the company submitting this proposal; and (2) that the company submitting this proposal is not an "Iran linked business," as that term is defined in Section 2(e) of the Iran Economic Sanctions Act, being Michigan Public Act No. 517 of 2012; and (3) That I and the company submitting this proposal will immediately comply with any further certifications or information submissions requested by the City in this regard.

THIS BID SUBMITTED BY:

Company (Legal Registration) Serv-Ice Refrigeration, Inc.

Address 143 Cady Centre # 207

City Northville State MI Zip 48167

Telephone 248-735-6000 Fax 248-692-0508

Representative's Name Bob Bishop

Representative's Title President

Authorized Signature Robert Bishop

E-mail sbishop4@comcast.net

Date 2/10/2017

SERV-ICE REFRIGERATION, INC.
143 Cady Centre, #207 • Northville, MI 48167 • Phone: (248) 735-6000 • Fax: (248) 735-6001

February 10, 2017

City of Novi
45175 Ten Mile Road
Novi, MI 48375

Subject: Evaporative Condenser Tower Replacement-**Voluntary Alternate**
Bid Due: 2/15/17

In lieu of the BAC Evaporative Condenser in the base bid, we can offer a WXR Model WXRD-1000, 304 stainless steel coils, 304 stainless steel shell and sump pan. Comes complete with spray pump, two direct drive fans, pan heater and make-up float. Frequency drives will be Yaskawa.

Deduct $6,175.00 from base bid price.
Total for the WXR Evaporative Condenser is $87,000.00

This voluntary alternate submitted by:
Robert Bishop
President
Serv-Ice Refrigeration, Inc.

WEST BEND
A MUTUAL INSURANCE COMPANY™

Bond Number 2334556

Bid Bond

KNOW ALL BY THESE PRESENTS, That We, Serv-Ice Refrigeration, Inc as Principal, and WEST BEND MUTUAL INSURANCE COMPANY, a corporation organized under the laws of the State of Wisconsin and having its principal office in Middleton, Wisconsin, in said State, as Surety, are held and firmly bound unto City of Novi as Owner, in the full and just sum of Five Percent (5 %) of amount bid for the payment whereof said Principal binds its heirs, administrators, and executors and said Surety binds itself, its successors and assigns firmly by these presents

WHEREAS, said Principal has submitted to said Owner a bid or proposal for

City of Novi Ice Arena Evaporative Condenser Tower Replacement

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH that if within Sixty days hereof and in accordance with said proposal a contract shall be awarded to said Principal and the said Principal shall enter into a contract for said work and shall furnish bond with surety as required for its faithful performance then this obligation shall be void, otherwise remain in full force and virtue.

Signed and Sealed this 15 day of February , 20 17

Principal:

Serv-Ice Refrigeration, Inc.

Witness: Susan Bisby

By: Robert Bisby (SEAL)

Name Typed ROBERT BISBY , PRESIDENT

Title

Surety:

West Bend Mutual Insurance Company

Witness: _____

By: Darlene Fisher (SEAL)

Name Typed: DARLENE FISHER , Attorney-In-Fact

Title

Agency Name: ALLIED INSURANCE MANAGERS INC

Address: 1055 E SOUTH BLVD, SUITE 110

ROCHESTER HILLS, MI 48307

Phone Number: (248) 853-0930

MICHIGAN ONLY: This policy is exempt from the filing requirements of Section 2236 of the Insurance Code of 1956, 1956 PA 218 and MCL 500.2236.

8401 Greenway Blvd. Suite 1100 | Middleton, WI 53562 | Phone: (608) 410-3410 | Fax: (877) 674-2663 | www.wbmi.com

WEST BEND
A MUTUAL INSURANCE COMPANY

2334556

Power of Attorney

Know all men by these Presents, That West Bend Mutual Insurance Company, a corporation having its principal office in the City of West Bend, Wisconsin does make, constitute and appoint:

DARLENE FISHER

lawful Attorney(s)-in-fact, to make, execute, seal and deliver for and on its behalf as surety and as its act and deed any and all bonds, undertakings and contracts of suretyship, provided that no bond or undertaking or contract of suretyship executed under this authority shall exceed in amount the sum of: Seven Million Five Hundred Thousand Dollars ($7,500,000)

This Power of Attorney is granted and is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of West Bend Mutual Insurance Company at a meeting duly called and held on the 21st day of December, 1999.

Appointment of Attorney-In-Fact. The president or any vice president, or any other officer of West Bend Mutual Insurance Company may appoint by written certificate Attorneys-in-Fact to act on behalf of the company in the execution of and attesting of bonds and undertakings and other written obligatory instruments of like nature. The signature of any officer authorized hereby and the corporate seal may be affixed by facsimile to any such power of attorney or to any certificate relating therefore and any such power of attorney or certificate bearing such facsimile signatures or facsimile seal shall be valid and binding upon the company, and any such power so executed and certified by facsimile signatures and facsimile seal shall be valid and binding upon the company in the future with respect to any bond or undertaking or other writing obligatory in nature to which it is attached. Any such appointment may be revoked, for cause, or without cause, by any said officer at any time.

In witness whereof, the West Bend Mutual Insurance Company has caused these presents to be signed by its president undersigned and its corporate seal to be hereto duly attested by its secretary this 1st day of March, 2009.

Attest James J. Pauly

James J. Pauly
Secretary

WEST BEND MUTUAL INSURANCE COMPANY CORPORATE SEAL WASHINGTON CO., WIS.

Kevin A. Steiner
Chief Executive Officer / President

State of Wisconsin
County of Washington

On the 1st day of March, 2009 before me personally came Kevin A. Steiner, to me known being by duly sworn, did depose and say that he resides in the County of Washington, State of Wisconsin; that he is the President of West Bend Mutual Insurance Company, the corporation described in and which executed the above instrument; that he knows the seal of the said corporation; that the seal affixed to said instrument is such corporate seal; that is was so affixed by order of the board of directors of said corporation and that he signed his name thereto by like order.

JOHN F. DUWELL NOTARY PUBLIC STATE OF WISCONSIN

John F. Duwell

John F. Duwell
Executive Vice President - Chief Legal Officer
Notary Public, Washington Co. WI
My Commission is Permanent

The undersigned, duly elected to the office stated below, now the incumbent in West Bend Mutual Insurance Company, a Wisconsin corporation authorized to make this certificate, Do Hereby Certify that the foregoing attached Power of Attorney remains in full force effect and has not been revoked and that the Resolution of the Board of Directors, set forth in the Power of Attorney is now in force.

Signed and sealed at West Bend, Wisconsin this 15 day of February, 2017

WEST BEND MUTUAL INSURANCE COMPANY CORPORATE SEAL WASHINGTON CO., WIS.

Dale J. Kent
Executive Vice President -
Chief Financial Officer

ELECTRICAL SPECIFICATIONS

GENERAL

1. PROVIDE ALL ITEMS, ARTICLES, MATERIALS, OPERATIONS OR METHODS REQUIRED TO ACCOMPLISH THE ELECTRICAL REVISIONS HEREIN SPECIFIED AND/OR INDICATED ON PLAN AND AS REQUIRED TO ACCOMMODATE PROJECT ARCHITECTURAL REVISIONS. INCLUDE MISCELLANEOUS ITEMS REQUIRED TO COMPLETE THE WORK, INCLUDING HANGERS, SUPPORTS, ANCHORS, EXPANSION MEANS, CONDUIT, WIRE, FITTINGS, ETC.
2. ALL ELECTRICAL WORK SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (N.E.C.), N.F.P.A., LOCAL AND STATE CODES, ORDINANCES AND REGULATIONS.
3. THE CONTRACTOR SHALL VISIT THE SITE, EXAMINE AND VERIFY THE CONDITIONS UNDER WHICH HIS WORK MUST BE CONDUCTED BEFORE SUBMITTING A PROPOSAL. THE SUBMITTING OF A PROPOSAL IMPLIES THAT THE CONTRACTOR HAS VISITED THE SITE AND IS CONVERSANT WITH ALL EXISTING CONDITIONS, OBSTRUCTIONS AND ALL CONDITIONS WHICH WILL BE ENCOUNTERED, AS REQUIRED TO PERFORM THE WORK AS INDICATED ON PLAN OR HEREIN SPECIFIED.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL TESTS NECESSARY TO DETERMINE THAT ALL WIRING AND EQUIPMENT INSTALLED UNDER THIS SPECIFICATION IS IN SATISFACTORY CONDITION AND BE PERFORMED TO THE SATISFACTION OF ALL HAVING JURISDICTION OVER THE ELECTRICAL WORK.
   A. THE ELECTRICAL CONTRACTOR SHALL GUARANTEE IN WRITING ALL WORK IN CONNECTION WITH HIS ELECTRICAL CONTRACT FOR A PERIOD OF ONE YEAR FROM THE DATE OF COMPLETION AND ACCEPTANCE BY THE OWNER. ALL WORK AND MATERIALS REQUIRED BY THE ELECTRICAL CONTRACTOR IN ORDER TO SATISFY THE GUARANTEE SHALL BE AT NO ADDITIONAL COST TO THE OWNER.

DEMOLITION

1. DISCONNECT, REMOVE, OR RELOCATE PRESENT EQUIPMENT, OUTLETS, FIXTURES, DEVICES, WIRING, ETC., AS INDICATED ON PLAN, HEREIN SPECIFIED, OR AS OTHERWISE REQUIRED TO CONFORM TO THE ELECTRICAL REVISIONS.
2. EXISTING WIRING ONCE REMOVED FROM CONDUIT OR BOXES SHALL NOT BE REUSED. EXISTING CONDUIT AND BOXES REMOVED SHALL NOT BE REUSED. REMOVED MATERIALS SHALL BE REMOVED FROM THE PREMISES EXCEPT ITEMS AS MAYBE DESIGNATED AS SALVAGEABLE MY THE OWNERS REPRESENTATIVE AND THESE ITEMS SHALL BE DELIVERED TO THE OWNER FOR THEIR DISPOSITION. DELIVERY SHALL INCLUDE PLACING THE ITEMS AT ANY LOCATION WITHIN THE BUILDING AS SO DIRECTED BY THE OWNER.
3. ALL WIRING SHALL BE REMOVED COMPLETE TO SOURCE. ALL UNUSED CONDUIT, OR CONDUIT NOT REQUIRED TO REMAIN SHALL BE REMOVED COMPLETE.
4. THE ORIGINAL FUNCTION OF THE PRESENT ELECTRICAL WORK TO BE MODIFIED SHALL NOT BE CHANGED UNLESS REQUIRED BY THE SPECIFIC REVISIONS TO THE SYSTEM AS SPECIFIED OR SHOWN ON THE PLANS.

BASIC MATERIALS AND METHODS

1. BRANCH CIRCUIT WIRE AND CABLE SHALL BE COPPER WITH 98% CONDUCTIVITY AND SHALL MEET THE TESTS AND STANDARDS SET FORTH BY NEMA, U.L. AND IPCEA. WIRE FOR GENERAL USE SHALL BE COPPER, TYPE THHN/THWN, 90 DEGREES C. ALUMINUM WIRE SHALL NOT BE USED. 120 VOLT BRANCH CIRCUIT WIRING SERVING CIRCUITS WHERE THE WIRE LENGTH FROM THE OVER CURRENT DEVICE TO THE LAST LOAD OR DEVISE ON THE CIRCUIT, IS GREATER THAN 100 FEET, SHALL BE #10 AWG.
2. IN GENERAL CONDUIT FOR USE ON THIS PROJECT SHALL BE THIN WALL (EMT) WITH COMPRESSION FITTINGS. RIGID STEEL CONDUIT SHALL BE USED WHERE REQUIRED BY CODE OR WHERE REQUIRED FOR PHYSICAL STRENGTH AND SHALL UTILIZE THREADED FITTINGS. ALL CONDUIT, CONDUIT ELBOWS AND COUPLINGS SHALL BE HOT DIPPED GALVANIZED AND CONFORM TO THE LATEST ANSI SPECIFICATIONS FOR STEEL CONDUIT, ZINC COATED.

SAFETY SWITCHES:

1. SAFETY SWITCHES SHALL BE PROVIDED WHERE INDICATED ON PLAN OR AS REQUIRED FOR CODE CONFORMANCE.
2. SAFETY SWITCHES SHALL BE HEAVY DUTY NON-FUSIBLE TYPE UNLESS INDICATED OTHERWISE, QUICK-MAKE, QUICK-BREAK, SAFETY INTERLOCK TYPE, SINGLE THROW, THREE POLE, WITH GROUND BUS OF 600 VOLT OR 250 VOLT RATING REQUIRED AND WITH AMPERE AND/OR HP RATINGS INDICATED ON AS DRAWINGS OR REQUIRED FOR THE INSTALLATION. IN GENERAL, ENCLOSURES SHALL BE NEMA 3R GENERAL PURPOSE TYPE.
3. SAFETY SWITCHES SHALL BE MANUFACTURED BY ALLEN BRADLEY, SIEMENS OR SQUARE D.

FUSES:

A. ALL FUSES SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. ALL FUSE HOLDERS SHALL BE PROVIDED WITH FUSE REJECTION CLIPS. ALL FUSES SHALL BE OF THE SAME MANUFACTURER AND SHALL BE BUSSMANN, OR GOULD.

B. CIRCUITS 0 TO 600 AMPERES SHALL BE PROTECTED BY BUSSMANN FUSETRON DUAL-ELEMENT FUSES FRN-R OR FRS-R OR APPROVED EQUAL. ALL DUAL-ELEMENT FUSES SHALL HAVE SEPARATE OVERLOAD AND SHORT CIRCUIT ELEMENTS. FUSE SHALL INCORPORATE A SPRING ACTIVATED THERMAL OVERLOAD ELEMENT HAVING A MELTING ALLOY AND SHALL BE INDEPENDENT OF THE SHORT CIRCUIT CLEARING CHAMBER. THE FUSE MUST HOLD 500% OF RATED CURRENT FOR A MINIMUM OF 10 SECONDS AND BE LISTED BY U.L., WITH AN INTERRUPTING RATING OF 200,000 AMPERES R.M.S. SYMMETRICAL.

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Client:

CITY OF NOVI

Project Title:
NOVI ICE ARENA
TOWER REPLACEMENT
EVAPORATIVE CONDENSER
TOWER REPLACEMENT

Date: 01-06-17
Issued for: BIDS AND PERMITS

Drawn: JC
Designed: JC
Checked:
Approved:

CAD Drawing File: ESK-1.dwg

Project Number:

Sheet Title:
ELECTRICAL
SPECIFICATIONS

Sheet Number:
ESK-1

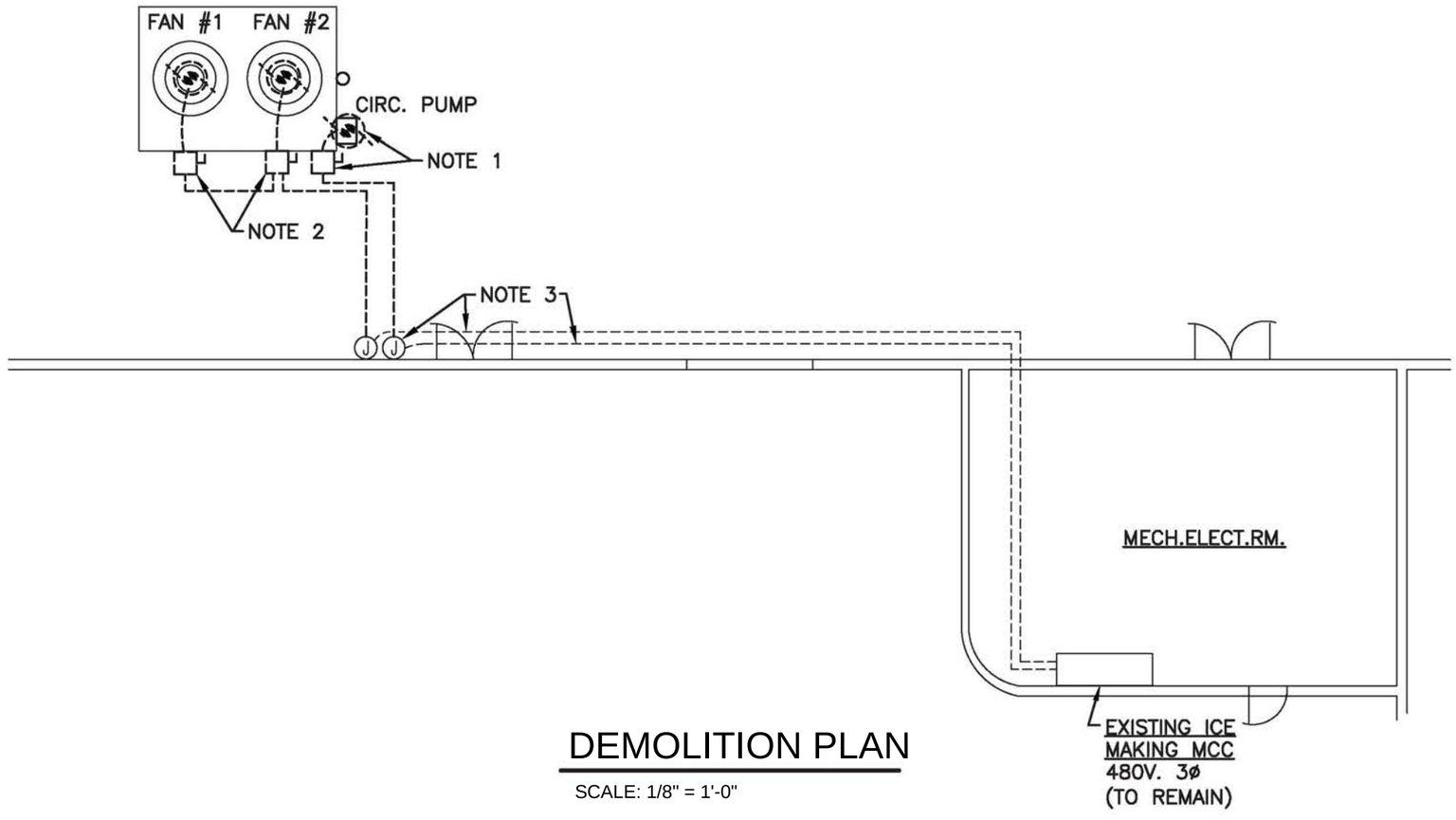
NOTES:

1. DISCONNECT PUMP AND PAN HEATER FOR REMOVAL BY MECHANICAL TRADES. REMOVE WIRING COMPLETE TO SOURCE (EXISTING MCC IN MECHANICAL/ELECTRICAL ROOM.). RE-USE CONDUIT AND JUNCTION BOX ATTACHED TO EXTERIOR WALL TO FEED NEW PUMP AND PAN HEATER.

2. DISCONNECT EVAP. CONDENSER FAN NO.1 AND NO.2 FOR REMOVAL BY MECHANICAL TRADES. REMOVE WIRING COMPLETE TO SOURCE (EXISTING MCC IN MECHANICAL/ELECTRICAL ROOM.). RE-USE CONDUIT AND JUNCTION BOX ATTACHED TO EXTERIOR WALL TO FEED NEW EVAP. CONDENSER FANS.

3. EXISTING WALL MOUNTED JUNCTION BOX AND CONDUIT TO EXISTING MCC TO BE RE-USED TO SERVE NEW WIRING TO NEW EVAP. CONDENSING UNIT, PAN HEATER AND CIRC. PUMP.

(E) EVAPORATIVE CONDENSER



DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

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Date: 01-06-17
Issued for: BIDS AND PERMITS

Drawn: JC
Designed: JC
Checked:
Approved:

CAD Drawing File: ESK-2.dwg

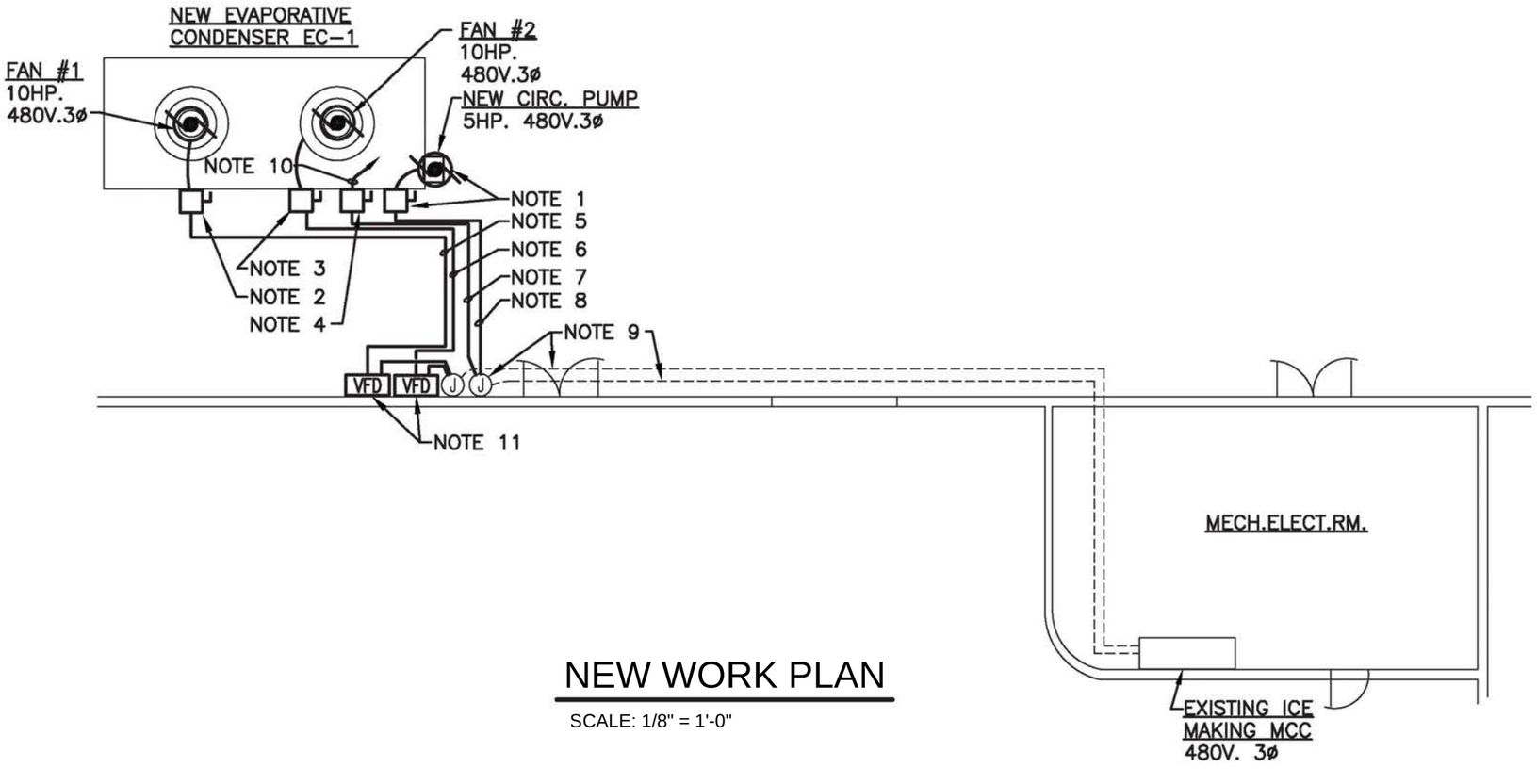
Project Number:

Sheet Title:
ELECTRICAL
DEMOLITION PLAN

Sheet Number:
ESK-2

NOTES:

1. NEW 30A.3P.480V. NON–FUSED NEMA 3R DISCONNECT SWITCH (PROVIDED BY MECHANICAL TRADES, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR) TO SERVE NEW CIRC. PUMP.
2. NEW 30A.3P.480V. NON–FUSED NEMA 3R DISCONNECT SWITCH (PROVIDED BY MECHANICAL TRADES, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR) TO SERVE NEW EVAP. FAN NO.1.
3. NEW 30A.3P.480V. NON–FUSED NEMA 3R DISCONNECT SWITCH (PROVIDED BY MECHANICAL TRADES, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR) TO SERVE NEW EVAP. FAN NO.2.
4. NEW 30A.3P.480V. NON–FUSED NEMA 3R DISCONNECT SWITCH (PROVIDED BY MECHANICAL TRADES, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR) TO SERVE NEW PAN HEATER.
5. PROVIDE NEW 3/4"C. FROM NEW DISCONNECT SWITCH SERVING FAN NO.1 TO EXISTING JUNCTION BOX VIA VFD, ROUTE NEW 3#10,1#12G. VIA NEW AND EXISTING CONDUIT TO EXISTING NEMA 1 STARTER IN ICE MAKING MCC. REPLACE FUSES WITH 20A. DUAL ELEMENT TIME DELAY TYPE.
6. PROVIDE NEW 3/4"C. FROM NEW DISCONNECT SWITCH SERVING FAN NO.2 TO EXISTING JUNCTION BOX VIA VFD, ROUTE NEW 3#10,1#12G. VIA NEW AND EXISTING CONDUIT TO EXISTING NEMA 1 STARTER IN ICE MAKING MCC.REPLACE FUSES WITH 20A. DUAL ELEMENT TIME DELAY TYPE.
7. PROVIDE NEW 3/4"C. FROM NEW DISCONNECT SWITCH SERVING PAN HEATER TO EXISTING JUNCTION BOX, ROUTE NEW 3#12,1#12G. VIA NEW AND EXISTING CONDUIT TO EXISTING NEMA 1 STARTER IN ICE MAKING MCC. REPLACE FUSES WITH 25A. DUAL ELEMENT TIME DELAY TYPE.
8. PROVIDE NEW 3/4"C. FROM NEW DISCONNECT SWITCH SERVING CIRC. PUMP TO EXISTING JUNCTION BOX, ROUTE NEW 3#10,1#12G. VIA NEW AND EXISTING CONDUIT TO EXISTING NEMA 1 STARTER IN ICE MAKING MCC. REPLACE FUSES WITH 15A. DUAL ELEMENT TIME DELAY TYPE.
9. EXISTING JUNCTION BOXES AND CONDUIT TO BE RE–USED TO SERVE NEW EVAPORATIVE CONDENSER EP–1.
10. 3#10,1#10G.–3/4"C. FROM DISCONNECT SWITCH TO PAN HEATER BY ELECTRICAL CONTRACTOR.
11. WALL MOUNT NEW NEMA 3R VARIABLE FREQUENCY DRIVE (VFD) PROVIDED BY MECHANICAL TRADES, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.



NEW WORK PLAN

SCALE: 1/8" = 1'-0"

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Date: 01-06-17
Issued for:

Drawn: JC
Designed: JC
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Approved:

CAD Drawing File: ESK-3.dwg

Project Number:

Sheet Title:
ELECTRICAL
NEW WORK PLAN

Sheet Number:
ESK-3

DEMOLITION GENERAL NOTES:

1. WORK SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES, LAWS, ACTS AND ORDINANCES AND ALL AUTHORITIES HAVING JURISDICTION.

2. THE OWNER RESERVES THE RIGHT TO SALVAGE ON ALL MATERIALS/ITEMS REMOVED.

3. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ANY PROBLEMS THAT MIGHT OCCUR DURING THE DEMOLITION WORK.

4. THE DEMOLITION CONTRACTOR SHALL REPAIR DAMAGES MADE TO THE EXISTING EQUIPMENT, UTILITY PIPING, AND INSULATION.

ABBREVIATIONS FOR DRAWINGS

ABBREV.	DESCRIPTION
RS	REFRIGERANT SUPPLY
RR	REFRIGERANT RETURN
CW	COLD WATER (MAKE UP)

GENERAL NOTES:

1. THE CONTRACTOR SHALL EXAMINE THE SITE AND BE FAMILIAR WITH THE CONDITIONS UNDER WHICH THIS CONTRACT MUST BE EXECUTED.

2. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL SYSTEMS WITH OTHER TRADES AND OWNER TO AVOID INTERFERENCES.

3. THE CONTRACTOR SHALL VERIFY ALL SPACE CONDITIONS AND DIMENSIONS PRIOR TO THE FABRICATION AND THE INSTALLATION OF THE PIPING SYSTEM.

4. ALL WORK SHALL BE DONE IN A MANNER CONDUCTIVE TO A PROFESSIONAL ENVIRONMENT. ALL AREAS MUST BE KEPT AS NEAT AS POSSIBLE, AND AREAS SHALL BE CLEANED BEFORE LEAVING SAID AREAS ON A DAILY BASIS.

5. PROVIDE COMPLETE OPERATING SYSTEMS WITH MATERIALS OF CONSTRUCTION AND METHODS OF FABRICATION, ASSEMBLY, ERECTION, TESTING, AND INTERIM OPERATION IN COMPLIANCE WITH THE REQUIREMENTS SPECIFIED HEREIN AND THE REQUIREMENTS OF APPLICABLE CODES AND AUTHORITIES HAVING JURISDICTION.

6. COORDINATE PIPE ROUTING AND EQUIPMENT INSTALLATION WITH EXISTING CONDITIONS TO AVOID INTERFERENCES.

7. DEMOLITION WORK SHALL BE COMPLETED TO THE EXTENT INDICATED OR SPECIFIED.

8. THE OWNERS NORMAL OPERATION IN SURROUNDING AREAS WILL BE CONTINUED DURING DEMOLITION. THE DEMOLITION SHALL NOT INTERFERE WITH THESE OPERATIONS IN ANY WAY WITHOUT THE OWNER'S EXPRESSED CONSENT. CONTRACTORS SHALL COORDINATE AND SCHEDULE EXTENT OF DEMOLITION WORK WITH OWNER IN FIELD.

9. COMPLY WITH OWNER'S CORPORATE STANDARDS AND ALL APPLICABLE LOCAL CODES, STANDARDS, AND REGULATIONS.

10. CONFIRM THAT EXISTING SYSTEMS ARE INACTIVE AND PURGED BEFORE TAPPING INTO THEM, UNLESS OTHERWISE DIRECTED.

11. CONTRACTOR SHALL REVIEW THE DOCUMENTS OF ALL INTERFACES TRADES, CONTRACTS, AND DRAWINGS PRIOR TO BIDDING AND COMMENCEMENT OF WORK TO ENSURE SUCCESS OF FINISHED WORK.

12. ALL EQUIPMENT AND MATERIAL BROUGHT TO THE SITE IS THE PROPERTY OF THE CONTRACTOR UNTIL THE OWNER HAS OFFICIALLY ACCEPTED THE FINAL INSPECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE PROTECTION FOR EQUIPMENT AND MATERIAL UNTIL COMPLETION OF THE PROJECT.

EVAPORATIVE CONDENSER SCHEDULE

MARK	LOCATION	UNIT TYPE	MANUFACTURER	MODEL NUMBER	BASE HEAT REJECTION	AIRFLOW RATE (CFM)	FAN DATA		PUMP DATA		REFRIGERANT
							HP	ELECTRICAL	HP	ELECTRICAL	
EC-1	ICE ARENA	INDUCED DRAFT	BALTIMORE AIRCOIL COMPANY	PCC-0214-0718N020	860	82,950	(2)10	460/3/60	5	460/3/60	R717

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Date: 01-06-17
Issued for: BIDS & PERMITS

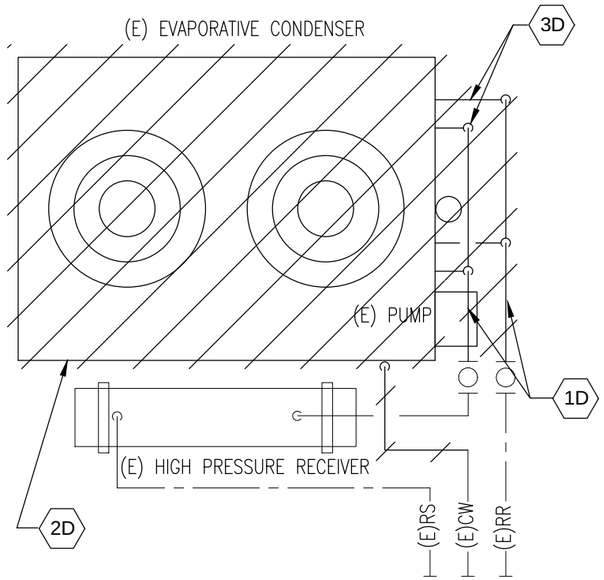
Drawn: MS
Designed: MS
Checked:
Approved:

CAD Drawing File: MSK-1.dwg

Project Number:

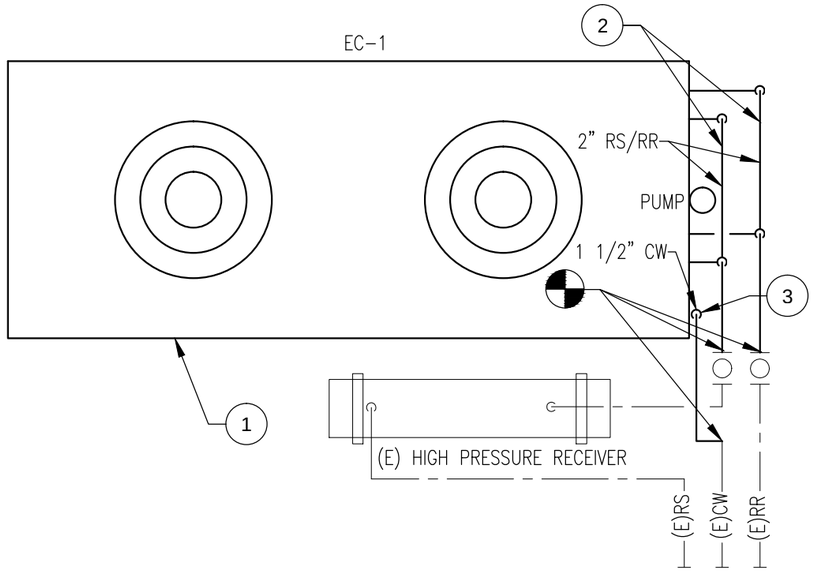
Sheet Title:
MECHANICAL SCHEDULES, NOTES, AND ABBREVIATIONS

Sheet Number:
MSK-1



DEMOLITION PLAN

SCALE: 1/4" = 1'-0"



NEW WORK PLAN

SCALE: 1/4" = 1'-0"

DEMOLITION KEY NOTES:

1D EVACUATE EXISTING AMMONIA FROM DEMOED PIPING THRU RELIEF VALVE INTO HIGH PRESSURE GAS RECEIVER. SEE MSK-7 FOR MORE INFO.

2D DISCONNECT AND REMOVE EXISTING EVAPORATIVE CONDENSER COMPLETE WITH SUPPORT STRUCTURE, COLD WATER PUMP, ELECTRICAL AND CONTROLS.

3D CUT AND CAP EXISTING REFRIGERANT SUPPLY/RETURN PIPING AND MAKE UP COLD WATER PIPING. AS INDICATED.

NEW WORK KEY NOTES:

1 NEW EVAPORATIVE CONDENSER (EC-1) COMPLETELY WITH PLATFORM, CW PUMP, ELECTRICAL AND CONTROLS. SEE MSK-3/4 FOR MORE INFO.

2 EXTEND NEW 2" REFRIGERANT SUPPLY/RETURN PIPES FROM EXISTING RS/RR AND CONNECT TO NEW EC-1. FIELD VERIFY EXISTING PIPING LOCATION AND SIZE.

3 EXTEND NEW 1 1/2" COLD WATER (CW) MAKE UP PIPE FROM EXISTING CW AND CONNECT TO NEW EC-1. FIELD VERIFY EXISTING PIPING LOCATION AND SIZE.

4 AFTER INSTALLATION OF EC-1 PRESSURE TEST AMMONIA PIPING FOR LEAKAGES.
CHARGE THE EC-1 WITH EXISTING AMMONIA. ADD NEW AMMONIA AS NECESSARY.
REFER TO IIAR STANDARD PRACTICES.

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Client:

CITY OF NOVI

Project Title:
NOVI ICE ARENA
TOWER REPLACEMENT
EVAPORATIVE CONDENSER
TOWER REPLACEMENT

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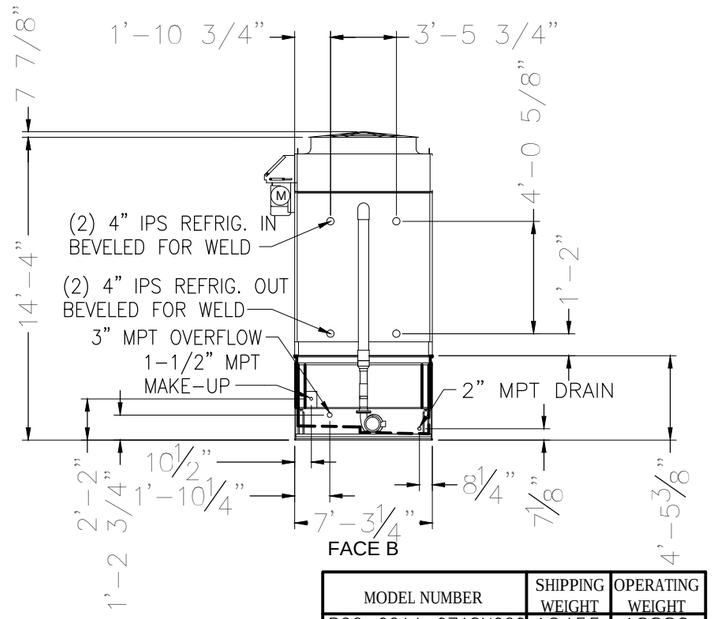
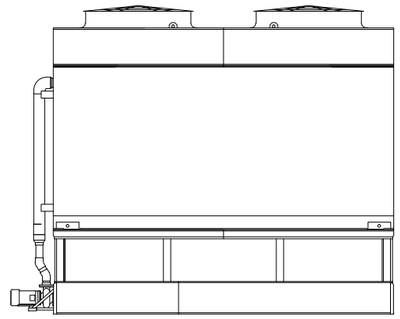
MECHANICAL
DEMO AND NEW
WORK PLAN

Sheet Number:
MSK-2

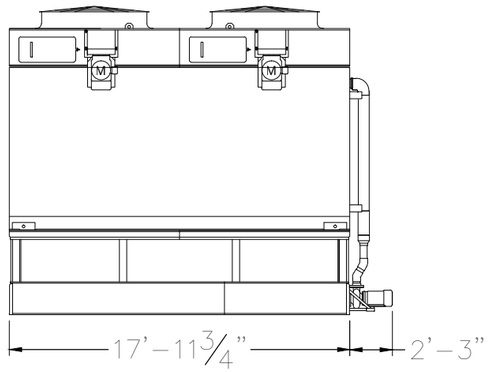


FACE B

MODEL NUMBER	SHIPPING WEIGHT	OPERATING WEIGHT
PCC-0214-0718N020	12455	18880



FACE C



FACE D

NOTES:

1. DRAWINGS ARE NOT TO SCALE. ALL DIMENSIONS ARE IN FEET AND INCHES.
2. UNLESS OTHERWISE INDICATED, CONNECTIONS 3" AND SMALLER ARE MPT AND CONNECTIONS 4" AND LARGER ARE BEVELED FOR WELDING.
3. DIMENSIONS SHOWING LOCATION OF COIL AND BASIN CONNECTIONS ARE APPROXIMATE AND SHOULD NOT BE USED FOR PREFABRICATION OF CONNECTING PIPING.
4. FOR WEIGHT LOADINGS AND SUPPORT REQUIREMENTS, REFER TO THE SUGGESTED STEEL SUPPORT DRAWING.
5. HEAVIEST SECTION IS THE COMBINED WEIGHT OF FAN AND COIL SECTIONS, REFER TO THE P-SERIES COUNTERFLOW INDUCED DRAFT COIL PRODUCTS RIGGING AND ASSEMBLY MANUAL FOR SUGGESTED LIFTING METHOD.
6. THE AREA ABOVE THE DISCHARGE MUST BE UNOBSTRUCTED.
7. DO NOT SUPPORT PIPING FROM UNIT CONNECTIONS. ALL NECESSARY PIPING SUPPORTS TO BE SUPPLIED BY OTHERS.
8. M = MOTOR LOCATION

EVAPORATIVE CONDENSER DETAIL

SCALE: NONE

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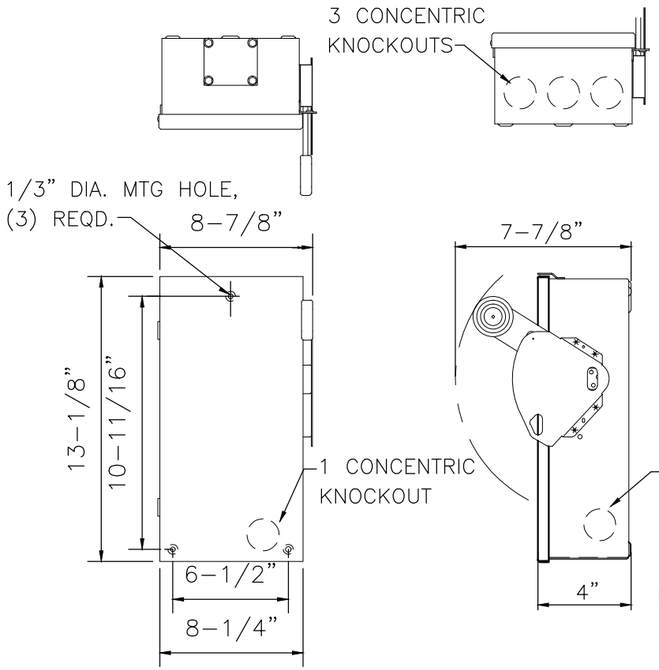
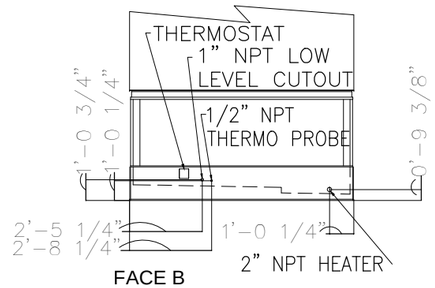


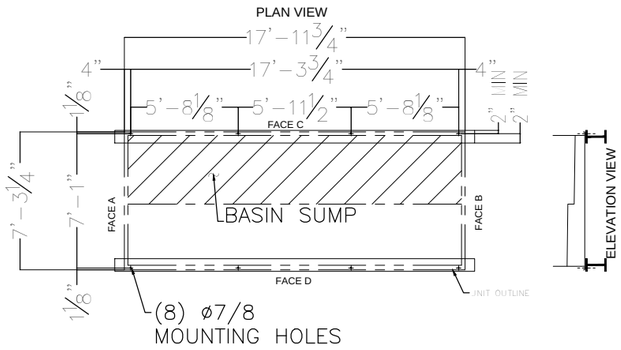
VFD PANEL

NOTES:

1) DISCONNECT SHIPS LOOSE, FIELD INSTALLATION AND WIRING BY OTHERS
2) DIMENSIONS: INCHES



BASIN ACCESSORIES



AMBIENT TEMPERATURE:-20F
HEATER QTY: 1
POWER (EACH): 15KW VOLTAGE: 460V PHASE: 3 FREQUENCY: 60Hz

UNIT SUPPORT

NOTES:

1. USE ONLY BAC PROVIDED VFD
2. NEVER SET DRIVE SPEED AMPERAGE ABOVE MOTOR NAMEPLATE SETTINGS
3. USE VFD RATED CABLE TO CONNECT THE MOTOR AND VFD, IF CABLE LENGTH IS OVER 300FT CONSULT THE OPERATION AND MAINTENANCE MANUAL FOR FILTER REQUIREMENTS
4. CONTROL WIRING SHOULD BE 20-22AWG SHIELDED WIRE
5. ALL WIRING MUST MEET LOCAL AND NATIONAL ELECTRIC CODES
6. MECHANICALLY LOCK OUT THE FAN BEFORE PERFORMING ANY WIRING WORK ON THE UNIT TO PREVENT VOLTAGE FROM BEING GENERATED BY A ROTATING FAN
7. DISCONNECT ALL POWER TO THE VFD AND MOTOR FOR AT LEAST 10 MINUTES BEFORE PERFORMING WORK ON THE SYSTEM
8. THE SOLENOID ACTUATED MAKE-UP VALVE IS RATED AT 6.1 WATTS, 16 VA HOLDING, 30 VA INRUSH.

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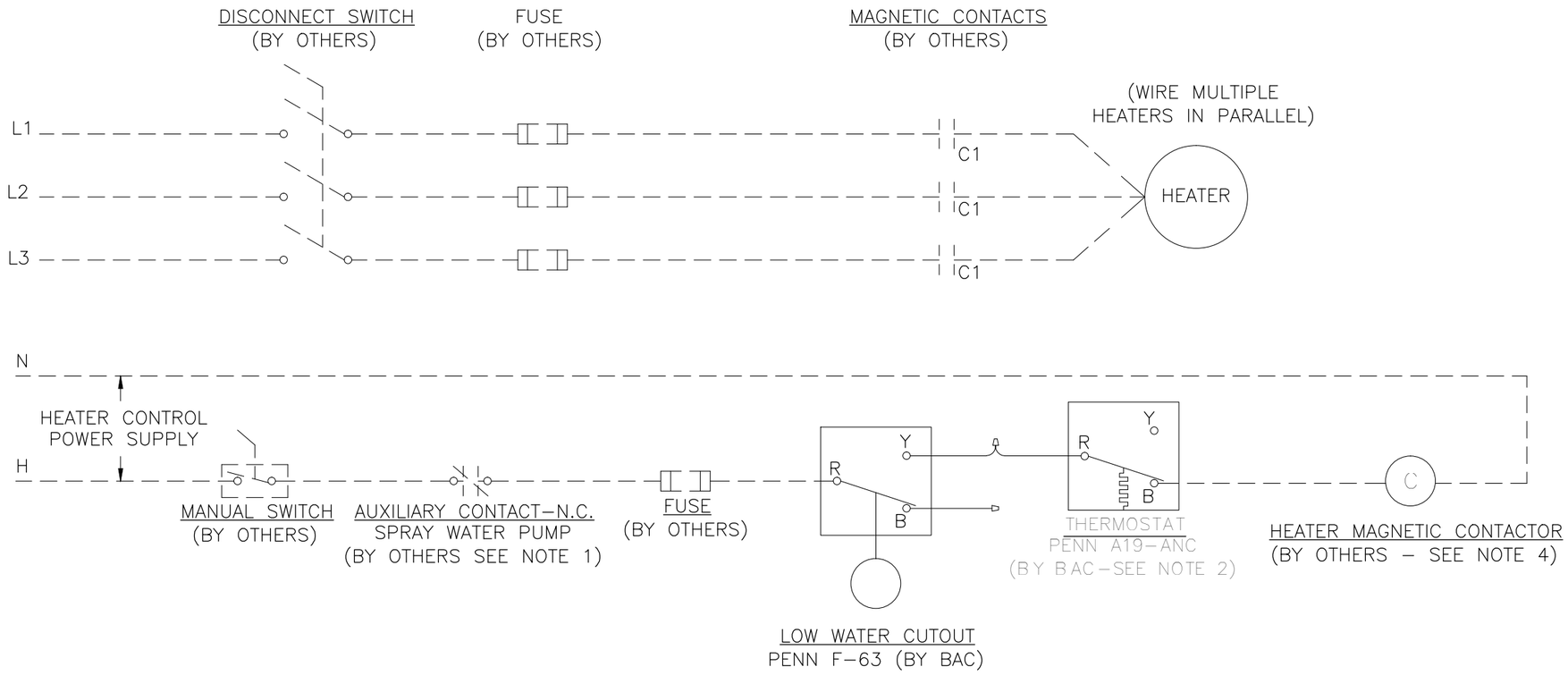

NOTES:

1. INTERLOCK IMMERSION HEATERS WITH CIRCULATING PUMP TO DE–ENERGIZE HEATERS WHEN PUMP IS RUNNING.
2. 2. CONTROL THERMOSTAT IS TO BE SET FOR 40° F. DO NOT SET THERMOSTAT LOWER THAN 40° F.
3. 3. BROKEN LINES INDICATE COMPONENTS AND WIRING TO BE SUPPLIED BY OTHERS.
4. 4. CONTRACTOR, FUSE PROTECTION AND POWER SUPPLY WIRING ARE TO BE SIZED TO MATCH HEATER REQUIREMENTS. WIRING MUST COMPLY TO APPLICABLE CODES AND ORDINANCES.

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CONTROLS

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MSK-5

EQUIPMENT DETAILS - ALL INFORMATION IS PER UNIT

UNIT TYPE:
- THIS UNIT WILL BE A FACTORY FABRICATED, INDUCED DRAFT, EVAPORATIVE CONDENSER WITH VERTICAL DISCHARGE.

UNIT HANDEDNESS:
- THE UNIT ORDERED IS A LEFT HAND UNIT.

QUALITY ASSURANCE:
- EACH UNIT WILL BE MANUFACTURED UNDER CLOSELY–CONTROLLED CONDITIONS USING STANDARDIZED PARTS TO ENSURE EACH UNIT IS BUILT PRECISELY TO THE SAME HIGH–QUALITY DESIGN AND CONSTRUCTION STANDARDS. THE DESIGN, MANUFACTURE, AND BUSINESS PROCESSES OF BALTIMORE AIRCOIL COMPANY ARE ISO 9001:2008 CERTIFIED.

MATERIALS OF CONSTRUCTION:
- ALL STRUCTURAL STEEL COMPONENTS ARE CONSTRUCTED FROM G–235 (Z700 METRIC) HOT–DIP GALVANIZED STEEL. THE EDGES OF THE HOT–DIP GALVANIZED STEEL COMPONENTS ARE GIVEN A PROTECTIVE COAT OF ZINC–RICH COMPOUND. ACCESS DOOR(S) ARE PROVIDED FOR INTERIOR INSPECTION, CLEANING, AND ADJUSTMENTS ARE CONSTRUCTED OF G–235 (Z700 METRIC) HOT–DIP GALVANIZED STEEL. THE HEAT TRANSFER CASING SECTION(S) IS (ARE) REMOVABLE FROM THE BASIN/FAN SECTION TO FACILITATE RIGGING. THE MOTOR BASE IS SHELTERED FROM THE WEATHER BY EITHER THE LOCATION WITHIN THE UNIT OR A PROTECTIVE MOTOR HOUSING. COLD WATER BASIN INCLUDES A DEPRESSED SECTION WITH DRAIN/CLEAN–OUT CONNECTION AND THE AREA UNDER THE COIL CASING IS SLOPED TOWARD THE DEPRESSED SECTION FOR EASY CLEANING.

FAN DRIVE SYSTEM:
- THE UNIT IS EQUIPPED WITH HEAVY DUTY, EXTRUDED ALUMINUM, AXIAL FLOW FANS DRIVEN BY THE EXCLUSIVE BALTIDRIVE® POWERTRAIN. THIS UNIQUE DRIVE SYSTEM UTILIZES SPECIAL MATERIALS OF CONSTRUCTION AND STATE OF THE ART TECHNOLOGY TO PROVIDE THE DURABILITY, STABILITY, AND LONGEVITY REQUIRED TO MEET THE DEMANDING NEEDS OF TODAY'S INDUSTRIAL REFRIGERATION SYSTEMS. THE FIVE–YEAR WARRANTY PROVIDED ON ALL BAC EVAPORATIVE COOLING EQUIPMENT IS THE MOST COMPREHENSIVE FAN MOTOR AND MECHANICAL EQUIPMENT WARRANTY AVAILABLE IN THE INDUSTRY. INCLUDED IN THE FIVE–YEAR WARRANTY ARE THE MECHANICAL EQUIPMENT SUPPORT, FAN(S), FAN SHAFT(S), BEARINGS, SHEAVES, AND FAN MOTOR(S). EXTENDED LUBRICATION LINES ARE STANDARD.
  THE MOTORS ON THE 7X9 AND 7X18 FOOTPRINTS SHIP LOOSE FOR FIELD INSTALLATION.

COIL TYPE:
- THE REFRIGERANT CONDENSING COIL SHALL BE FABRICATED OF 1.05" O.D. ALL PRIME SURFACE STEEL AT THE MANUFACTURER'S OWN FACILITY, AND HOT–DIP GALVANIZED AFTER FABRICATION (HDGAF). COIL SHALL HAVE A MAXIMUM ALLOWABLE WORKING PRESSURE OF 300 PSIG (2170 KPA) AND IS TESTED AT 375 PSIG (2685 KPA) AIR PRESSURE UNDER WATER. THE REFRIGERANT CONDENSING COIL SHALL BE DESIGNED FOR LOW PRESSURE DROP WITH SLOPING TUBES FOR FREE DRAINAGE OF LIQUID REFRIGERANT. THE REFRIGERANT CONDENSING COIL SHALL BE ASME B31.5 COMPLIANT.

DRIFT ELIMINATORS:
- DRIFT ELIMINATORS WILL BE CONSTRUCTED OF POLYVINYL CHLORIDE (PVC), AND WILL BE REMOVABLE IN EASILY HANDLED SECTIONS. THEY WILL IMPART THREE DISTINCT CHANGES IN AIR DIRECTION TO EFFECTIVELY STRIP ENTRAINED MOISTURE FROM THE LEAVING AIRSTREAM WITH MINIMUM AIR RESISTANCE.

UNIT SUPPORTS:
- PLAN A SUPPORT BEAMS WILL BE FURNISHED AND INSTALLED BY OTHERS.

EQUIPMENT STRUCTURE:
- THE STRUCTURE OF THIS PRODUCT HAS BEEN DESIGNED, TESTED AND INDEPENDENTLY CERTIFIED IN ACCORDANCE WITH THE WIND AND SEISMIC LOAD REQUIREMENTS OF THE 2012 INTERNATIONAL BUILDING CODE (IBC) AND ASCE/SEI 7–10. FOR MORE INFORMATION AND SPECIFIC WIND AND SEISMIC LOAD CAPACITY RATINGS, PLEASE SEE THE CERTIFICATE OF WIND AND SEISMIC LOAD CAPACITY.

BASIN WATER LEVEL CONTROL:
- BASIN WATER LEVEL CONTROL ASSEMBLIES WILL CONSIST OF LARGE–DIAMETER POLYSTYRENE–FILLED FLOATS, ADJUSTABLE LINKAGES, AND CORROSION RESISTANT MAKE–UP VALVES.

BASIN HEATER(S):
- UNITS EXPOSED TO BELOW FREEZING AMBIENT TEMPERATURES REQUIRE PROTECTION TO PREVENT FREEZING OF THE BASIN WATER WHEN THE UNIT IS IDLE. THE HEATER(S) HAVE BEEN SELECTED TO MAINTAIN +40°F BASIN WATER TEMPERATURES OFFERING A SIMPLE AND INEXPENSIVE WAY OF PROVIDING SUCH PROTECTION. THE ELECTRIC IMMERSION HEATERS ARE SHIPPED INSTALLED. SOME FIELD WIRING IS REQUIRED.

HEATER ELEMENT MATERIAL OF CONSTRUCTION:
- THE UNIT IS SUPPLIED WITH COPPER HEATER ELEMENTS.

BASIN HEATER CONTROL:
- THE HEATERS ARE INSTALLED IN THE BASIN AND ARE CONTROLLED BY A REMOTE THERMOSTAT WITH THE SENSING BULB IN THE BASIN. A LOW–WATER CUTOFF SWITCH PREVENTS HEATER OPERATION UNLESS THE HEATER ELEMENTS ARE FULLY SUBMERGED. SOME FIELD WIRING IS REQUIRED.

WATER OULET(S):
- THE UNIT WILL BE PROVIDED WITH A BOLT HOLE PATTERN FOR THE WATER OUTLET.

REFRIGERATION CONTROLS:
- A SINGLE VFD SIZED TO CONTROL ALL FAN MOTORS PER CELL.

REFRIGERANT PRESSURE SENSOR:
- A REFRIGERANT PRESSURE SENSOR SHALL BE PROVIDED WITH EITHER THE VFD ONLY OPTION OR THE TOTAL CONTROLS PACKAGE.

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Sheet Number:
MSK-6

STANDARD OPERATING PROCEDURES
AMMONIA UNLOADING (LOAD–IN) PROCEDURE
STANDARD OPERATING PROCEDURE

PREPARATION 1. BE FAMILIAR WITH THE EMERGENCY RESPONSE PROCEDURES FOR THE FACILITY.
2. KNOW THE LOCATION OF THE NEAREST EYE WASH/SAFETY SHOWER.
3. KNOW THE LOCATION OF THE VALVES, WHICH WOULD HAVE TO BE CLOSED TO ISOLATE THE LINE/EQUIPMENT IN AN EMERGENCY.
4. BE FAMILIAR WITH AMMONIA FIRST AID PROCEDURES.
5. BE FAMILIAR WITH THE LINE AND EQUIPMENT OPENING PROCEDURES.
ASSEMBLE EQUIPMENT BEFORE GOING TO THE AMMONIA UNLOADING PROCEDURE, ASSEMBLE THE FOLLOWING EQUIPMENT:
A ELBOW–LENGTH RUBBER GLOVES
B SPLASH GOGGLES AND FACE SHIELD
C CLEAN BUCKET CONTAINING WATER OR QUICK ACCESS TO A WATER HOSE.
D CLOSED VALVE MARKERS AND LOCKS
E EMERGENCY SERVICE BUCKET CONTAINING A FULL FACE TYPE GAS MASK, EYE WASH BOTTLE, PIPE WRENCH
AMMONIA UNLOADING PROCEDURES
1. NOTIFY PERSONNEL AND SUPERVISORS IN THE AREA THAT AMMONIA–UNLOADING PROCEDURES ARE TO BE CARRIED OUT.
2. ENSURE THAT A BACKUP PERSON (BUDDY–SYSTEM), IN ADDITION TO THE DELIVERY TANK TRUCK DRIVER, IS AVAILABLE FOR THE REMAINDER OF THESE PROCEDURES.
3. CHECK THE DOCUMENTS PROVIDED BY THE DELIVERY TANK TRUCK TO ENSURE DELIVERY OF THE CORRECT GRADE AND PURITY OF AMMONIA.
4. ENSURE THAT THE DRIVER OF THE TANK TRUCK HAS PULLED THE TANK TRUCK AS CLOSE AS POSSIBLE TO THE UNLOADING LINE TO MINIMIZE THE POTENTIAL FOR ACCIDENTS.
5. ENSURE THAT THE DELIVERY TRUCK DRIVER LOCKS THE TRUCK?S BRAKES AND CHOCKS THE WHEELS. USE YELLOW CAUTION TAPE TO ISOLATE THE AREA. USE CONES TO PROTECT HOSE FROM ANY VEHICLE TRAFFIC.
6. ALLOW THE DELIVERY PERSON TO USE HIS CHECKLIST TO CHECK THE EQUIPMENT AND CONDITIONS IN THE REFRIGERATION ROOM.
7. SLOWLY REMOVE THE CAP FROM THE UNLOADING LINE AT THE CONTROLLED PRESSURE RECEIVER. INSTALL PROPER ADAPTOR FOR LIQUID HOSE.
8. WORK WITH DELIVERY DRIVER AS REQUIRED. UNROLL THE AMMONIA HOSE AND INSPECT IT CAREFULLY FOR CRACKS OR OTHER SIGNS OF WEAR THAT COULD RESULT IN HOSE FAILURE AND TO ENSURE IT IS RATED FOR AMMONIA SERVICE AND VERIFY THAT IT IS WITH IN DATE. NEVER USE A HOSE THAT IS IN POOR CONDITION OR THAT IS NOT RATED AND IS VERIFIED SAFE AND IN DATE FOR AMMONIA SERVICE.
9. WHEN YOU HAVE COMPLETED THE ABOVE STEPS, GIVE THE GO AHEAD TO THE DELIVERY PERSON THAT HE MAY CONNECT THE HOSE TO THE TANK TRUCK AND TO THE UNLOADING LINE.
10. PLANT ENGINEER OR PLANT OPERATOR SHOULD MONITOR THE DELIVERY PERSON AS HE CLOSES THE BLEED VALVE ON THE UNLOADING HOSE.
11. OPEN THE VALVE IN THE UNLOADING LINE AT THE CPR AND THE MANUAL VALVES ON THE TANK TRUCK.
12. MONITOR CLOSELY AS TRUCK PUMP IS STARTED AND BEGIN UNLOADING AMMONIA TO THE CPR. VERIFY THAT THE PUMP FLOW DIRECTION INDICATOR SHOWS PROPER FLOW DIRECTION. BE SURE TO MONITOR THE LEVELS IN THE CONTROLLED PRESSURE RECEIVER AND IN THE TANK TRUCK.
13. WHEN THE AMMONIA UNLOADING IS COMPLETED, CLOSE THE UNLOADING VALVE LOCATED ON THE TANK TRUCK FIRST AND THEN CLOSE THE VALVE LOCATED ON THE CPR.
14. SEE THAT THE PUMP DOWN SYSTEM ON THE TRUCK IS USED TO PUMP DOWN ANY RESIDUAL AMMONIA IN THE UNLOADING HOSE BACK TO THE TRUCK.
15. OPEN THE BLEED VALVE TO DRAIN ANY RESIDUAL AMMONIA IN THE UNLOADING HOSE INTO A BUCKET OF WATER. WHEN THERE IS NO MORE AMMONIA IN THE HOSE, CLOSE THE BLEED VALVE AND DISCONNECT THE BLEED HOSE AND THE UNLOADING HOSE.
16. WAIT APPROXIMATELY 10 MIN. TO LET ANY RESIDUAL OIL DRIP OFF THE UNLOADING LINE. THEN REPLACE THE CAP ON THE UNLOADING LINE.
17. BE SURE TO MONITOR THE LEVEL IN THE HIGH–PRESSURE RECEIVER OVER THE NEXT SEVERAL HOURS.
18. AFTER THE WORK IS COMPLETED, NOTIFY THE AREA PERSONNEL, THE SUPERVISORS, AND THE BACKUP PERSONNEL.

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