

Cooling Tower and Dehumidification Unit Installation

TOWNSHIP OF ESQUIMALT – ESQUIMALT'S ARCHIE BROWNING SPORTS CENTRE 1151 Esquimalt Rd, Esquimalt V9A 3N6

Invitation to Bid Date:

November 28, 2023

TOWNSHIP OF ESQUIMALT November 28, 2023

TOWNSHIP OF ESQUIMALT 1151 Esquimalt Rd., Esquimalt V9A 3N6

November 28, 2023

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1.1 <u>GENERAL</u>

This project is for the installation of an owner supplied Evaporative Condenser and Dehumidification Unit to the following facility:

Esquimalt Archie Browning Sports Centre 1151 Esquimalt Rd., Esquimalt, B.C.

- 1. Prior to Bid submission, examine the specification and ascertain the extent and nature of all conditions, limitations or building regulations affecting the performance of the Work.
- 2. The bid shall include the cost of permitting and taking delivery of the equipment will be the responsibility of the installation contractor, royalties, freight, government duties and taxes where applicable.
- 3. Prices contained in the bid, whether unit prices or lump sums, are quoted in utmost good faith without any collusive arrangement or agreement with any person or corporation.
- 4. It is the intention of the Owner to award the selected work to one (1) Contractor.
- 5. The awarding of this Bid is subject to the Township of Esquimalt executive approval and/or funding. Should Bid submissions not receive approval and/or exceed funding levels, Township of Esquimalt reserves the right to reject without penalty, any, or all bids.

1.2 WORK SCHEDULE

- 1. Upon award of the project, a detailed schedule in Gantt Chart form is to be provided to the consultant, who will review and provide comments in 5 working days. The Gantt Chart is expected to mirror the milestones presented below, to not delay regular operation of the facility entering Fall 2024
- 2. All equipment is to be onsite prior to June 3rd, 2024, barring any owner or consultant delays.
- 3. Anticipated Construction Schedule (All Dates in 2024)
 - April 12th Ice rink shutdown
 - April 15th The successful contractor is to be onsite to remove roof mounted equipment and ductwork, refer to drawings for scope of work
 - April 22nd Roofers start roof replacement
 - April 22nd Potential Equipment Arrival Dates
 - June 3rd Roofing work complete, Installation of Dehumidifier and Evaporative Condenser Start
 - August 2nd Substantial Completion
 - August 16th Total Completion

1.3 <u>CONTRACT FORM</u>

- 1. The form of Contract between the accepted bidder and Owner will be a CCDC2 2020 Contract from the Township of Esquimalt.
- 2. The holdback percentage shall be ten percent (10%). This holdback shall be released upon substantial completion of the installation contract, currently expected by August 2024.

1.4 <u>TECHNICAL ENOUIRIES</u>

1. Any questions regarding the Work during the bid period shall be directed to Chris Best at (250) 661-2870.

TOWNSHIP OF ESQUIMALT November 28, 2023

1.5 <u>PRE-BID SITE MEETING</u>

Mandatory Site Visit at Archie Browning Arena December 5th at 11AM. Please meet in front of the arena, a sign in sheet will be provided.

1.6 BID CLOSING AND SUBMISSION

- 1. The closing date and time for this bid request is:
 - Date: December 12th, 2023

Time: 11:00:00 Hours Local Time Per the Township of Esquimalt wall clock located in the Archie Browning Sport Centre

2. Email bids will be accepted

3. Bidders have the sole responsibility to deliver and ensure bids are received with the date and time at;

Township of Esquimalt 1151 Esquimalt Rd, Esquimalt, BC

Email: <u>steve.knoke@esquimalt.ca</u>

- CC: dan.henderson@esquimalt.ca
- CC: larry.braes@esquimalt.ca
- CC: <u>ChrisBest@amegroup.ca</u>

Electronic Bid Amendments will be accepted.

- 4. Bidders must complete and return all the mandatory documentation by the bid closing date and time 11am December 12th, 2023.
- 5. Completed Bid Form together with the required submittals shall be included in the email.
- 6. The email shall be clearly marked "Esquimalt Archie Browning Sports Centre Cooling Tower and Dehumidification Unit Installation
- 7. Submissions received after Closing will be returned unopened to the Contractor. It is the Contractor's responsibility to allow sufficient time for their agent to deliver their submission or any amendments to the specific physical location by the closing.
- 8. The Owner will not accept an amendment to a previously submitted Bid unless:
 - It indicates a change to a bid already submitted.
 - It is from the same person(s) who sent the original Bid submission.
- 9. A Submission may be withdrawn by written notice or email only, provided such notice is received at the main office at the specific physical location set out in this section prior to the bid closing.
- 10. Submissions received by the Owner at the specified location prior to the bid closing will be opened after bid closing. All Submissions received by bid closing will be opened and are subject to review and evaluation by the Owner.

1.7 ACCEPTANCE / REJECTION OF BIDS AND IRREVOCABILITY

- 1. The Owner reserves the right to reject any or all Submissions, or to accept any part of any submission and to waive any informality or irregularity in bids received. Submissions which contain qualifying conditions or otherwise fail to conform to the tender documents may be disqualified or rejected.
- 2. Bids submitted will be irrevocable and open for acceptance for sixty (60) days following the Closing.

1.8 ADDENDA

- 1. Any explanation, interpretation or clarification of the tender documents will be made in the form of Addenda.
- 2. No oral explanation, interpretation, or clarification of the tender documents by any person whatsoever shall bind the Owner in the interpretation of the tender documents.
- 3. Explanations, interpretations, or clarifications, in the form of Addenda, may be issued by the Owner prior to Closing. Any Addenda issued will be emailed to the contractors. The Contractor is solely responsible to ensure that they have received all addenda prior to submitting their bid.
- 4. All Addenda issued by the Owner shall be incorporated into and become part of the tender documents.

1.9 CONTRACTO R' S INCURRED COSTS

1. The submission of a bid by the Contractor constitutes the agreement of the Contractor to be solely responsible for any and all costs and expenses incurred by it in preparing and submitting its bid. This includes any costs incurred by the Contractor after bid closing, or due to the Owner's acceptance or non-acceptance of their submission.

1.10 DISCLAIMERS/LIABILITY FOR ERRORS

 While the Owner has made considerable effort to ensure an accurate representation of information, the information contained herein is supplied solely as a guideline for Contractors. The information is not guaranteed or warranted to be accurate by the Owner, its directors, officers, servants, employees, or agents, nor is it necessarily comprehensive or exhaustive. Nothing in this tender is intended to relieve Contractors from forming their own opinions and conclusions with respect to the matters addressed in this tender.

END OF SECTION

To: TOWNSHIP OF ESQUIMALT 1151 Esquimalt Rd, Esquimalt, BC V9A 3N6

Name of Company

Phone Number

Address

We acknowledge receipt of the following addenda to the tender documents:

| Addendum No.: | Date: | Pages: |
|---------------|-------|--------|
| Addendum No.: | Date: | Pages: |

Esquimalt Archie Browning Sports Centre Supply of Cooling Tower and Dehumidification Unit as specified.

| EQUIPMENT COST: | | Dollars (\$ | | _) |
|---|---|-------------|-----|----|
| INSTALLATION COST: | | Dollars | (\$ |) |
| GST: Dollars (\$ |) | PST: (\$ |) | |
| Total Dollars (\$ |) | | | |
| Current Leadtime for all equipment (weeks): | | | | |

ACCEPTANCE

- 1. This Bid is open to acceptance for a period of ten (10) days from the date of bid closing.
- 2. Having examined the Specifications, including addenda, we hereby offer to perform the work set forth in the aforesaid documents.
- 3. Submission of this bid implies acceptance of the existing conditions at the site.
- 4. In submitting this tender, we recognize and agree that the Owner reserves the right to accept any tender, to reject any or all tenders, to waive any irregularity or informality in a tender, and to negotiate with and award to one or more of the bidders after the Tender Closing. Without limitation, the Owner shall not be obligated to accept the lowest or any other tender, and by submitting a tender each bidder assumes all costs and risks associated therewith, and irrevocably releases any claim it may have against the Owner or any of its trustees, officers, employees or agents, whether based in contract, tort, legitimate expectation or any other principle of law, trade, custom or practice.

Name of Company

Date

Signature & Name of Company Official

PART1 GENERAL

1.1 DESCRIPTION

- 1. Contractor to install a new evaporative condenser and arena dehumidifier using the provided mechanical, electrical and structural drawings at:
- 2. Archie Browning Sports Centre 1151 Esquimalt Rd., Esquimalt, BC
- 3. Contract Documents to be reviewed in their entirety with all sections, including the drawing packages from all disciplines
- 4. Equipment Startup and Commissioning is to be provided by the manufacturer for both pieces of equipment included in this project as part of the equipment price and do not need to be included in the installation bid.
- 5. Over the course of the work schedule, the building is being re-roofed, including the area where the scope of work in these contract documents is referring to. The successful contractor is to coordinate with the roofing contractor regarding the timing and access to site for the removal of the existing equipment and the timing and access to site for the installation of the new equipment.
- 6. The pre-ordered equipment price will be provided via addendum in order for the successful contractor to include the required 1 year warranty from substantial completion in their bid.

1.2 **PROJECT SCHEDULE**

- 1. Contractor to provide a schedule within 5 days from contract award.
- 2. All equipment is to be onsite by June 3rd, 2023, barring any owner or consultant delays.

1.3 EXAMINATION OF DRAWINGS. SPECIFICATIONS. AND WORKSITE

1. Carefully examine and study, as indicated in instructions to bidders, all bid requirements together with any other necessary data or conditions that may affect performance of work to determine full extent of work.

1.4 **BID PRICING**

1. Provide a Stipulated Sum Price on Bid Form to perform all work outlined in this Summary of Work, its related technical specification sections, and as shown in the specification.

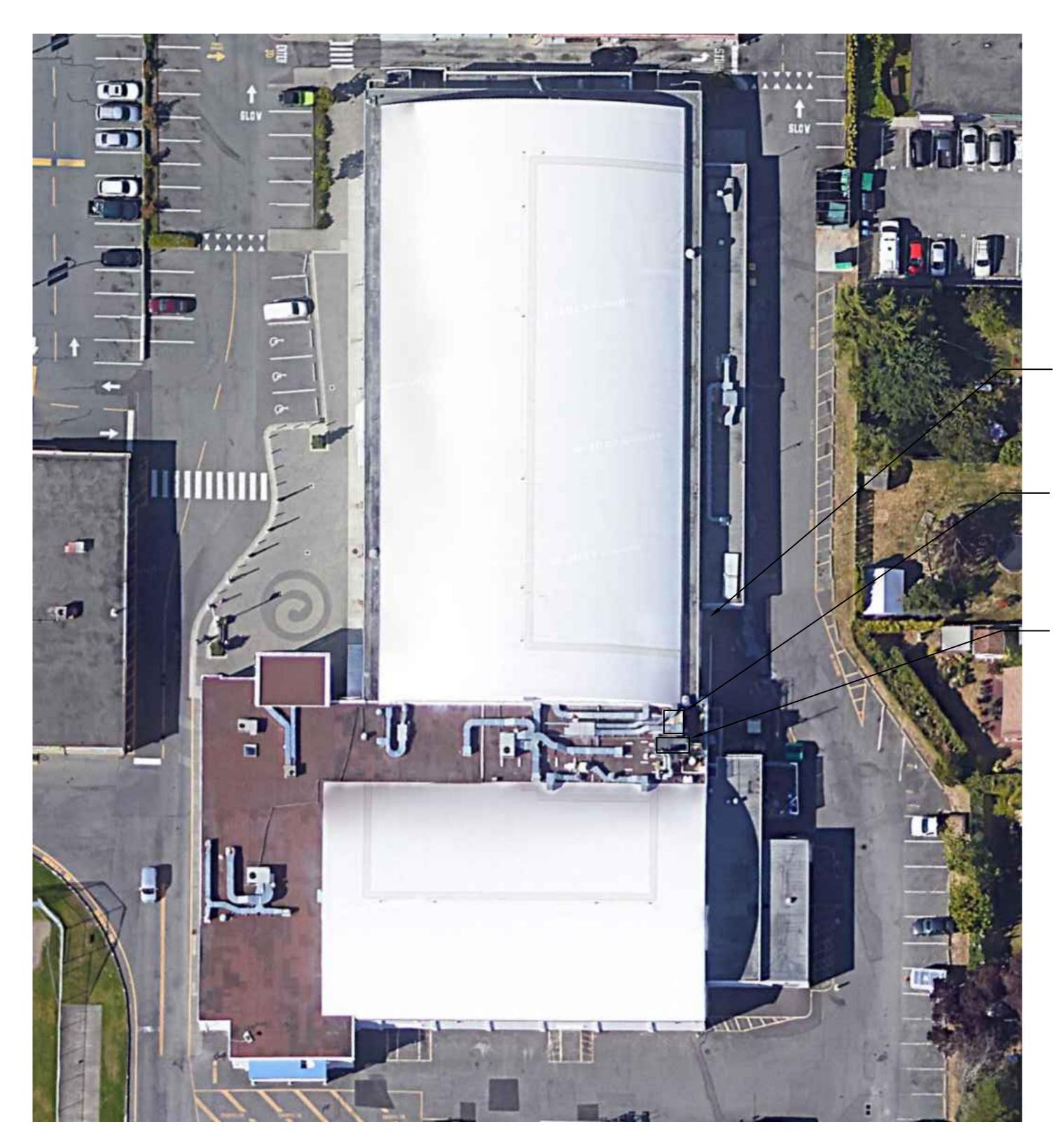
PART 2 - PRODUCTS

Refer to attached stamped mechanical, electrical, and structural drawing sets for further information

PART 3 – EXECUTION

Not Applicable

END OF SECTION





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EXISTING DEHUMIDIFIER

— EXISTING CONDENSER

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| <pre>/// HIRR/// // CONDS/// // CONDS/// /// S//// /// S//// // S//// ///</pre> | HRR CONDS CONDR /ALVES /ALVES / CONDR CONDR / / / / / / / / / / / / / | | CONDENSER WATER RETURN DIRECTION OF FLOW PIPE DROP PIPE RISE PIPE TEE UP PIPE TEE DOWN PIPE UNION ISOLATION VALVE (NORMALLY OPEN) ISOLATION VALVE (NORMALLY OPEN) ISOLATION VALVE (NORMALLY CLOSED) CHECK VALVE 2-WAY CONTROL VALVE 3-WAY CONTROL VALVE BALANCING VALVE PRESSURE REDUCING VALVE (PRV) POOL FLOW CONTROL VALVE STRAINER RELIEF VALVE BACKFLOW PREVENTOR (BFP) AUTOMATIC AIR VENT (AAV) | | BDD | | MOTORIZED DAMPER (MD) FIRE DAMPER - VERTICAL (FD) FIRE DAMPER - HORIZONTAL (FD) DUCT OR PIPE CAP-OFF RETURN OR EXHAUST AIR GRILLE UNDER-CUT DOOR GRILLE TYPE NECK/GRILLE SIZE AIR VOLUME EQUIPMENT/FIXTURE TYPE GENERAL NOTE DRAWING REVISION DETAIL NUMBER | NOT FOR CONSTRUCTION PROJECT TITLE: ARCHIE BROWNIN |
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| | | | CONDENSER WATER RETURN DIRECTION OF FLOW PIPE DROP PIPE RISE PIPE TEE UP PIPE TEE DOWN PIPE UNION ISOLATION VALVE (NORMALLY OPEN) ISOLATION VALVE (NORMALLY CLOSED) CHECK VALVE 2-WAY CONTROL VALVE 3-WAY CONTROL VALVE BALANCING VALVE PRESSURE REDUCING VALVE (PRV) POOL FLOW CONTROL VALVE STRAINER RELIEF VALVE BACKFLOW PREVENTOR (BFP) AUTOMATIC AIR VENT (AAV) SEISMIC GAS SHUT-OFF VALVE TEMPERATURE GAUGE PRESSURE GAUGE | | BDD | | MOTORIZED DAMPER (MD) FIRE DAMPER - VERTICAL (FD) FIRE DAMPER - HORIZONTAL (FD) DUCT OR PIPE CAP-OFF RETURN OR EXHAUST AIR GRILLE UNDER-CUT DOOR GRILLE TYPE NECK/GRILLE SIZE AIR VOLUME EQUIPMENT/FIXTURE TYPE GENERAL NOTE DRAWING REVISION DETAIL NUMBER DRAWING NUMBER SECTION NUMBER | NOT FOR CONSTRUCTION PROJECT TITLE: ARCHIE BROWNIN SPORTS CENTRE - |
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| | | | CONDENSER WATER RETURN DIRECTION OF FLOW PIPE DROP PIPE RISE PIPE TEE UP PIPE TEE DOWN PIPE UNION ISOLATION VALVE (NORMALLY OPEN) ISOLATION VALVE (NORMALLY CLOSED) CHECK VALVE 2-WAY CONTROL VALVE 3-WAY CONTROL VALVE BALANCING VALVE PRESSURE REDUCING VALVE (PRV) POOL FLOW CONTROL VALVE STRAINER RELIEF VALVE BACKFLOW PREVENTOR (BFP) AUTOMATIC AIR VENT (AAV) SEISMIC GAS SHUT-OFF VALVE TEMPERATURE GAUGE THERMOMETER PUMP ENERGY METER BTU METER OPEN DRAIN HOSE-BIBB (HB) FLOOR DRAIN (FD) | | BDD | | MOTORIZED DAMPER (MD) FIRE DAMPER - VERTICAL (FD) FIRE DAMPER - HORIZONTAL (FD) DUCT OR PIPE CAP-OFF RETURN OR EXHAUST AIR GRILLE UNDER-CUT DOOR GRILLE TYPE NECK/GRILLE SIZE AIR VOLUME EQUIPMENT/FIXTURE TYPE GENERAL NOTE DRAWING REVISION DETAIL NUMBER DRAWING NUMBER SECTION NUMBER | NOT FOR CONSTRUCTION PROJECT TITLE: ARCHIE BROWNING SPORTS CENTRE - HVAC REPLACEME PROJECT ADDRESS: 1153 Esquimalt Road, Victoria, BC |

| NIT NUMBER | QTY UNIT DESCRIPTION | UNIT LOCATION | ELECTRIC | CAL LOAD | | | VOLT PH | | EQUIPMEN | IT | STARTER | R | | | C | ISCONNECT | Γ | CONTROL | L | | | EMERGENCY | NOTES |
|------------|--|-------------------------------------|----------|----------|-------------|------------|-------------|-------|----------|----|------------|------------|-------------|------------|-----------|-------------|------------------|----------|---|---|------|-------------------|-------|
| | | | МСА | FLA | KW | HP | | S | I | с | S | I | С | TYPE | S | 1 | С | s | 1 | с | TYPE | POWER (YES/NO) | |
|)H-1 | 1 DEHUMIDIFIER | ROOF | 139 | 111.2 | | | 575 3 | М | М | E | Е | E | E | PCS | E | E | Е | М | М | М | BMS | NO | 1 |
| :T-1 | 1 EVAPORATIVE CONDENSER - Fan | ROOF | | | | 20 | 575 3 | М | М | E | Е | Е | E | VFD | E | E | Е | М | М | М | BMS | NO | 1 |
| CT-1 | 1 EVAPORATIVE CONDENSER - Pump | ROOF | | | | 1.5 | 575 3 | М | М | E | Е | E | E | VFD | E | E | Е | М | М | М | BMS | NO | 1 |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | SUPPLIER / INSTALL / WIRE CODES: | CONTROL DEVICE CODES: | | | ELECTRICA | AL LOAD CO | DDES: | | | | GENERAL | NOTES: | | | | | | | | | | | |
| | MECH = MECHANICAL | AQUA = PUMP CONTROLLED BY AQUASTAT | | | BHP = BRA | KE HORSEI | POWER | | | | A. ALL FIF | RE ALARM I | DEVICES WI | RED BY ELE | CTRICAL | | | | | | | | |
| | ELEC = ELECTRICAL | BMS = BLDG MANAGEMENT SYSTEM | | | FLA = UNIT | FULL LOAD | D AMPS | | | | B. CONTF | ROL PANEL | S ARE SHIPI | PED LOSS & | REQUIRE | FIELD WIRI | ١G | | | | | | |
| | G = GENERAL CONTRACTOR | ES = END SWITCH | | | HP = UNIT (| OR MOTOR | HORSE POV | /ER | | | C. PCS E | QUIPMENT | REQUIRES | SINGLE SOU | JRCE POW | ER CONNEC | TION, UN | NLESS | | | | | |
| | S = SUPPLIED BY | ET = LINE VOLTAGE T'STAT | | | PH = POWE | ER PHASE | | | | | NOTE | D OTHERW | /ISE | | | | | | | | | | |
| | I = INSTALLED BY | FA = FIRE ALARM | | | MCA = MINI | IMUM CIRC | UIT AMPS | | | | D. CP, VF | d Equipme | ENT REQUIR | RES POWER | WIRING TO | | I CONTRO | OL PANEL | | | | | |
| | C = CONNECTED BY | FAP = FIRE ALARM PANEL | | | VOLT = REG | QUIRED SU | IPPLY VOLTA | GE | | | TO CC | ONTROLLE | | ΝT | | | | | | | | | |
| | | FS = FLOW SWITCH | | | | | | | | | | | | | | | | | | | | | |
| | STARTER CODES: | GS = GAS SENSOR | | | MISCELLAN | NEOUS COE | DES: | | | | NOTES: | | | | | | | | | | | | |
| | MAN = MANUAL STARTER | H = HUMIDITY SENSOR | | | FFCP = FIR | E FIGHTER | S CONTROL | PANEL | | | 1. S | INGLE POI | NT POWER | CONNECTIO | N (EXCEP | T FOR LIGHT | ⁻ S). | | | | | | |
| | HOA = MAGNETIC STARTER W/ HAND/OFF/AUTO | I = INTERLOCK, SEE NOTES | | | FRAC = FR | ACTIONAL I | HORSEPOWE | R | | | 2 1 | NDOOR UN | IT IS POWEF | RED BY OUT | DOOR UNI | Т | | | | | | | |
| | SWITCH W/ AUX. CONTACTS | LIGHT = WIRED TO LIGHT SWITCH | | | INT = INTEC | GRAL PART | OF UNIT | | | | | | | | | | | | | | | | |
| | MAG = MAGNETIC STARTER C/W AUX STATUS CONTACTS | LS = LEVEL SWITCH | | | | | | | | | | | | | | | | | | | | | |
| | MRR = MOTOR RATED RELAY, 24 VAC COIL | OS = OCCUPANT SENSOR | | | | | | | | | | | | | | | | | | | | | |
| | & MOTOR PROTECTION SWITCH | PS = PRESSURE SWITCH | | | | | | | | | | | | | | | | | | | | | |
| | PCS = PACKAGED CONTROL SYSTEM | R. STAT = REVERSE ACTING THERMOSTAT | | | | | | | | | | | | | | | | | | | | | |
| | VFD = VARIABLE FREQUENCY DRIVE | TC = TIME CLOCK | | | | | | | | | | | | | | | | | | | | | |
| | RVS = REDUCED VOLTAGE STARTER | T = LOW VOLTAGE T'STAT OR SENSOR | | | | | | | | | | | | | | | | | | | | | |
| | WS = WALL SWITCH | TS = TAMPER SWITCH | | | | | | | | | | | | | | | | | | | | | |
| | CP = CONTROL PANEL | VS = VARIABLE SPEED SWITCH | | | | | | | | | | | | | | | | | | | | | |
| | | WS = WALL SWITCH | | | | | | | | | | | | | | | | | | | | | |

| COOLING TO | WER SCHEDULE |
|---------------|---------------------------|
| EQUIPMENT TAG | DESCRIPTIC |
| CT-1 | COOLING TOV |
| | |
| NOTES: | |
| 1 | PROVIDE FLOAT TYPE WAT |
| 2 | PROVIDE MANUFACTURER |
| 3 | PROVIDE VARIABLE SPEED |
| 4 | VIBRATION ISOLATION (AS F |
| 5 | PROVIDE CHILLED WATER (|

| | | | | | | | | | TE | EMPERATURES (DEG F |) | FAN MOTOR | | NOTES |
|---------------------|---------|---------------------------|-----------|------------|---------------|-------|---------|---------------|------------|--------------------|------------|-----------|-------|-------|
| PTION | SERVICE | MANUFACTURER | MODEL NO. | LxWxH | OPERATING WT. | FLOW | COOLING | FLUID P. DROP | FLUID TYPE | CONDENSING | INLET AIR | AIR FLOW | MOTOR | |
| | | | | (INCHES) | (LBS) | (GPM) | (MBH) | (FT. WG) | | TEMPERATURE | (DEG F WB) | (CFM) | (HP) | |
| TOWER | ARENA | BALTIMORE AIRCOIL COMPANY | VC1-205 | 144X57X138 | 10,420 | 220 | 2700.0 | - | R-717 | 95.0 | 68.0 | 35,800 | 20 | ALL |
| | | | | | | | | | | | | | | |
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| VATER LEVEL CONTROL | | | | | | | | | | | | | | |

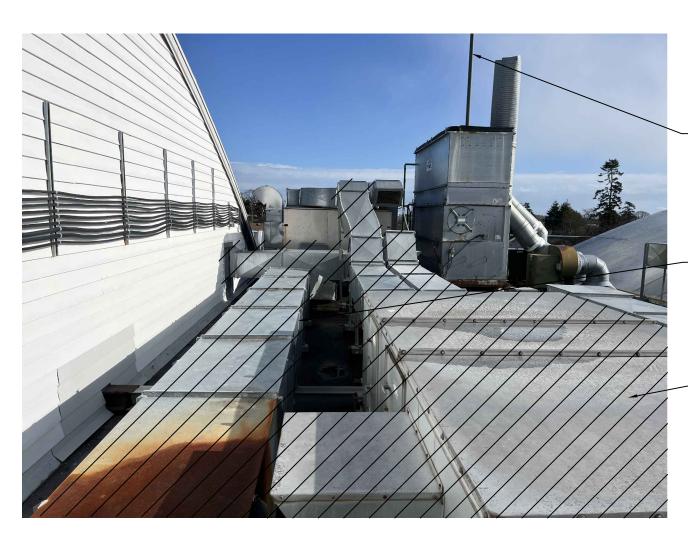
ER STRUCTURAL STEEL SUPPORT AS REQUIRED ED DRIVE ON FAN MOTOR.

AS PER SPECIFICATIONS). R GLYCOL CONNECTIONS FOR ICEPLANT COMPRESSOR COOLING

| ГАG | DH-1 |
|--|-------------------------------------|
| QUANTITY | 1 |
| OCATION | ROOFTOP |
| SERVICE | DEHUMIDIFIER |
| IANUFACTURER | NOVELAIRE |
| IODEL | DH8000 |
| SUPPLY FAN | |
| IORMAL VOLUME (CFM) | 7,000 |
| IINIMUM OUTDOOR AIR (CFM) | 2,000 |
| XTERNAL STATIC (IN. WG) | 1.5 |
| OTAL STATIC (IN. WG) | 3.6 |
| AN SPEED (RPM) | 1800.0 |
| IOTOR (HP) | 7.5 |
| FD MODEL | CFW500C07P0T5DB20 |
| OWER SUPPLY | 600-3-60 |
| EGENERATION FAN | |
| OLUME (CFM) | 2,000 |
| XTERNAL STATIC (IN. WG) | 0.0 |
| OTAL STATIC (IN. WG) | 1.4 |
| AN SPEED (RPM) | 1.4 |
| IOTOR (HP) | 1750.0 |
| | |
| | CFW500C01P7T5DB20 |
| | 600-3-60 |
| | |
| | 3 |
| | 100 |
| AT (DEG. F) | 80.0 |
| AT (DEG. F) | 225.0 |
| CR | Watlow/DB20-60F0-000 |
| | |
| DESICCANT WHEEL (SUMMER) | |
| IOISTURE REMOVAL (LB/HR) | 134.0 |
| /IEDIA | FSG |
| ROTATION SPEED (RPH) | 8.0 |
| AT (DEG. F) | 225.0 |
| GRAINS/LB | 76.0 |
| AT (DEG. F) | 117.2 |
| GRAINS/LB | 10.5 |
| /FD MODEL | WEG CFW300 |
| DESICCANT WHEEL (RECIRC) | |
| IOISTURE REMOVAL (LB/HR) | 100.4 |
| IEDIA | FSG |
| ROTATION SPEED (RPH) | 8.0 |
| AT (DEG. F) | 225.0 |
| RAINS/LB | 26.0 |
| AT (DEG. F) | 133.7 |
| RAINS/LB | 3.7 |
| FD MODEL | WEG CFW300 |
| LTERS | |
| IAIN FILTER | MERV 8 |
| IMENSIONS | |
| | 204X90X98 |
| | 204730730 |
| | |
| EMARKS | |
| REMARKS IOTES: | |
| xWxH (INCH) REMARKS IOTES: 1 2 | BMS CONNECTION OUTDOOR PAD MOUNT |

| // | i Jonnso | E Group |
|---|--|--|
| | | 5999 amegroup.ca |
| This dr for the only b THE CO REPOR COMM | project named I e reproduced wi ONTRACTOR SHAI T ALL ERRORS AN AENCING THE WO | In is the property of the designer to be used only below. This page or any portion thereof shall th express written permission. LL CHECK AND VERIFY ALL DIMENSIONS AND D OMISSIONS TO THE CONSULTANT PRIOR TO ORK. NOT TO BE SCALED. |
| REV. | DATE | DESCRIPTION |
| <u>1.</u> 2. | 2023.02.07 2023.03.21 | ISSUED FOR COORDINATION ISSUED FOR CLIENT REVIEW |
| <u>3.</u> | 2023.10.04 2023.10.20 | ISSUED FOR FINAL REVIEW |
| 5. | 2023.11.24 | ISSUED FOR TENDER |
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| seal N C Proj A Sf | ECT TITLE: RCHI | RUCTION E BROWNING |
| seal N C Proj A Sf | ECT TITLE: RCHI | RUCTION E BROWNING S CENTRE - |
| SEAL NC PROJ A SF H | ECT TITLE: RCHI PORTS VAC | RUCTION E BROWNING S CENTRE - REPLACEMENT |
| SEAL NC PROJ A SF H | ECT TITLE: RCHI PORTS VAC | RUCTION E BROWNING S CENTRE - REPLACEMENT |
| SEAL NC PROJ A SF H | ECT TITLE: RCHI PORTS VAC | RUCTION E BROWNING S CENTRE - REPLACEMENT |
| SEAL NC PROJ A SF H 11 | ECT TITLE: RCHI PORTS VAC | RUCTION E BROWNING S CENTRE - REPLACEMENT |
| SEAL NC PROJ A SF H II II II | ECT TITLE: RCHI PORTS VAC | RUCTION E BROWNING S CENTRE - REPLACEMENT SS: alt Road, Victoria, BC |
| SEAL NC PROJ ASF H PROJ 11 DRAV CHEC SCAL | ECT TITLE: RCHI PORTS VAC IECT ADDRE: 53 Esquima NN BY CKED BY .E | RUCTION E BROWNING S CENTRE - REPLACEMENT SS: alt Road, Victoria, BC |
| SEAL NC PROJ ASF H PROJ 11 DRAV CHEC SCAL DATE | ECT TITLE: RCHI PORTS VAC ECT ADDRE 53 Esquima WN BY CKED BY E | RUCTION E BROWNING S CENTRE - REPLACEMENT SS: alt Road, Victoria, BC |
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| SEAL NC PROJ ASF H PROJ 11 DRAV CHEC SCAL DRAV | ECT ADDRE SOR FC ONST PORTS VAC ECT ADDRE 53 Esquime VAC | RUCTION E BROWNING S CENTRE - REPLACEMENT SS: alt Road, Victoria, BC JI CJB AS NOTED November 24, 2023 NICAL |
| SEAL NC PROJ ASF H PROJ 11 DRAV CHEC SCAL DRAV | ECT TITLE: RCHI PORTS VAC IECT ADDRE: 53 Esquima MN BY CKED BY .E MING TITLE: | RUCTION E BROWNING S CENTRE - REPLACEMENT SS: alt Road, Victoria, BC JI CJB AS NOTED November 24, 2023 NICAL |

PROJECT NO. DRAWING NO. 000a-1303-22 MO.01



AMMONIA RELIEF TO REMAIN. PROVIDE TEMPORARY SUPPORT DURING CONSTRUCTION.

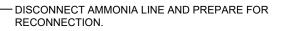
REMOVE EXISTING DUCTWORK. CAP OFF ANY PENETRATION REMAINING.

REMOVE EXISTING HRV. REMOVE CONNECTING DUCTWORK. CAP OFF ANY PENETRATION REMAINING.



02 M1.01 SCALE: NTS





-DISCONNECT GLYCOL LINE AND PREPARE FOR RECONNECTION.

- REMOVE SANITARY DRAIN LINE.

-DISCONNECT MAKEUP WATER LINE AND PREPARE FOR RECONNECTION.



ROOFTOP SITE IMAGE - DEMOLITION SCALE: NTS



M1.01 SCALE: NTS

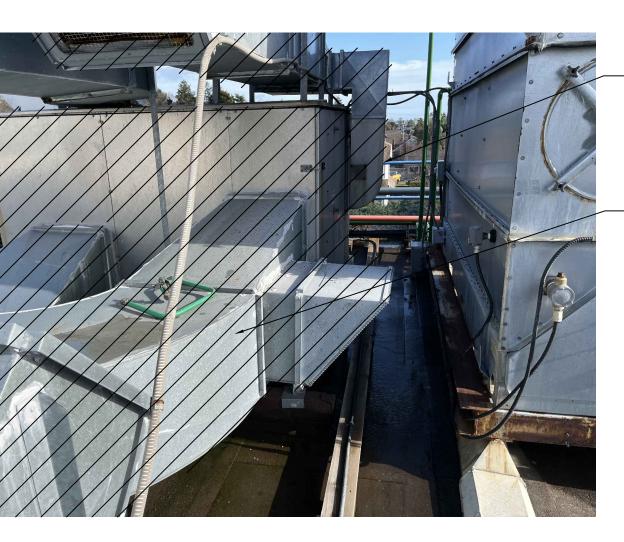
ROOFTOP SITE IMAGE - DEMOLITION

- AMMONIA RELIEF TO REMAIN. PROVIDE TEMPORARY SUPPORT DURING CONSTRUCTION.

-EXISTING CONDENSER RELIEF PIPING TO BE REMOVED.

- STACK SENSOR TO REMAIN UNDISTURBED DURING THE COURSE OF CONSTRUCTION. IF THE STACK SENSOR IS MOVED. CONTRACTOR TO REVERIFY.









ROOFTOP SITE IMAGE - DEMOLITION M1.01 SCALE: NTS

REMOVE EXISTING DEHUMIDIFIER. REMOVE EXISTING DUCTWORK.

- REMOVE EXISTING DUCTWORK AND APPURTENANCES.

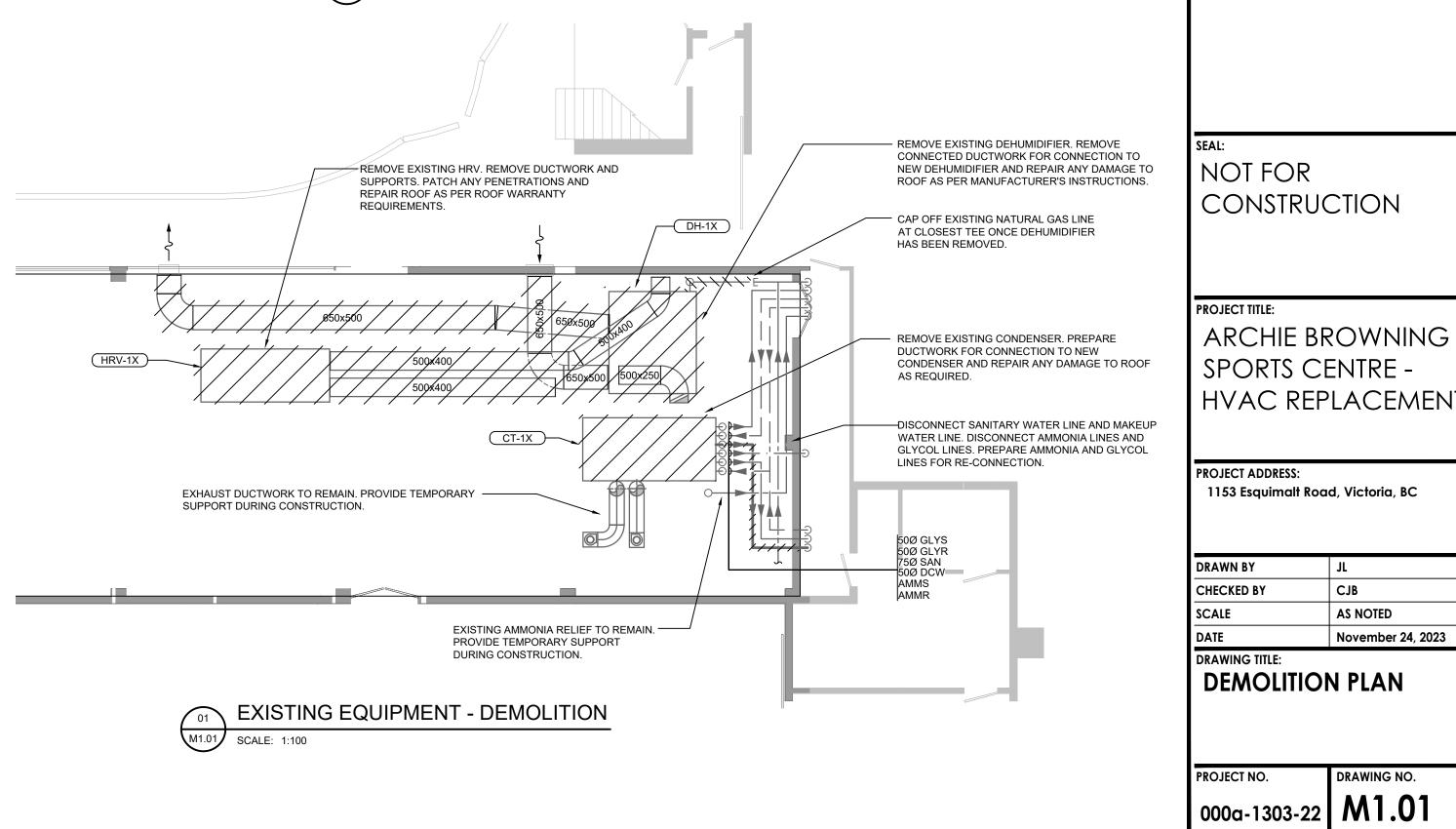
GENERAL NOTES:

WRITTEN LETTER FROM THE OWNER IS REQUIRED TO DO SO. 6. ALL DUCTWORK SIZES ARE SHOWN AS INSIDE CLEAR. ADD APPROPRIATE DIMENSION FOR INSULATION OR DUCT LINER TO OBTAIN OUTSIDE DUCT DIMENSIONS.

APPLICATION.

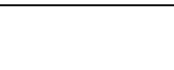


M1.01 SCALE: NTS



ROOFTOP SITE IMAGE - DEMOLITION SCALE: NTS

M1.01



DEMOLITION & RENOVATION NOTES

1. CONTRACTOR IS RESPONSIBLE FOR REVIEWING AND VERIFYING ACTUAL ONSITE CONDITIONS AND EQUIPMENT LOCATIONS PRIOR TO ANY AND ALL DEMOLITION WORK AND/OR EQUIPMENT REMOVAL.

2. CONTRACTOR TO INCLUDE ALL CUTTING AND PATCHING THAT IS REQUIRED TO INSTALL ALL NEW MECHANICAL SYSTEMS AS REQUIRED TO MEET THE SITE CONDITIONS AS SHOWN ON THE DRAWINGS. PATCHING SHALL MEET THE AESTHETIC CONDITIONS WHICH WAS THE CONDITION PRIOR TO ANY CUTTING BEING PREFORMED.

3. CONTRACTOR TO PROPERLY SEAL AND REPAIR ANY AND ALL DAMAGE THAT IS A RESULT OF REMOVAL OR DEMOLITION OF MECHANICAL EQUIPMENT. THIS INCLUDES BUT IS NOT LIMITED TO WALL, DOOR, CEILINGS, ETC. 4. THE EXISTING DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED AND FURNISHED BY OTHERS. AS A RESULT, THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THIS DOCUMENT.

5. ALL EXISTING DUCTWORK INDICATED ON PLAN WAS TAKEN FROM EXISTING MECHANICAL PLANS AND SHALL NOT BE CONSIDERED 100% ACCURATE. CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING SYSTEMS PRIOR TO CONSTRUCTION. 6. DURING REMOVAL OF ITEMS SO INDICATED, CAUTION SHOULD BE USED TO PREVENT DAMAGE TO ANY EQUIPMENT HAVING SALVAGE VALUE. ALL REUSABLE SALVAGED MATERIAL SHALL REMAIN THE PROPERTY OF THE OWNER AND BE RETAINED FOR THEIR INSPECTION. ONLY ITEMS AGREED BY THE OWNER SHALL BE DISPOSED OF BY THE CONTRACTOR.

7. GIVE BASE BUILDING A MINIMUM 24 HOURS NOTICE OF ANY SERVICE SHUTDOWN. 8. IF ASBESTOS IS DISCOVERED ON THE PREMISES, OWNER SHALL BE NOTIFIED AND ALL WORK SHALL CEASE IMMEDIATELY UNTIL ASBESTOS ABATEMENT WORKS ARE COMPLETED.

1. THE MECHANICAL SYSTEM AND ALL OTHER SYSTEMS SHALL CONSIST OF ALL WORK SHOWN ON THE DRAWINGS, DIAGRAMS, SCHEMATICS AND AS DESCRIBED IN THE SPECIFICATIONS. 2. COORDINATE THE DRAWINGS WITH THE SPECIFICATIONS AND IN CASES WHERE CONFLICTS OCCUR THE MOST STRINGENT

REQUIREMENT SHALL APPLY. 3. CONTRACTOR TO COORDINATE ALL MECHANICAL WORK WITH THAT OF OTHER TRADES TO ENSURE PROPER AND ADEQUATE

INTERFACE WITH THE WORK OUTLINED FOR THIS PROJECT. 4. CONTRACTOR TO PROVIDE CEC (CANADIAN ELECTRICAL CODE) CLEARANCE HORIZONTAL AND VERTICAL REQUIREMENTS FOR ALL INSTALLED EQUIPMENT. OFFSET MECHANICAL WORK AS REQUIRED TO MEET THIS REQUIREMENT. 5. MECHANICAL EQUIPMENT SHALL NOT BE USED FOR TEMPORARY HEATING OR COOLING DURING THE CONSTRUCTION PROCESS. A

7. ALL OPEN ENDS OF DUCTWORK DURING DEMOLITION AND INSTALLATION SHALL BE CAPPED AND KEPT CLEAN. 8. MAXIMUM FLEXIBLE DUCT LENGTH SHALL BE NO LONGER THAN 1.0 METER UNLESS OTHERWISE NOTED FOR THE SPECIFIC

9. INSTALL ALL MECHANICAL WORK AS HIGH AS POSSIBLE TIGHT TO STRUCTURE. 10. CONTRACTOR TO PROVIDE A SIMILAR TYPE DUCT CONSTRUCTION FOR ALL EXPOSED APPLICATIONS (I.E. NO LONGITUDINAL SEAM & SPIRAL IN EXPOSED APPLICATIONS). FLANGE TYPE DUCTWORK IN EXPOSED AREAS IS PROHIBITED FOR THIS PROJECT UNLESS OTHERWISE NOTED AS A SPECIFIC REQUIREMENT.

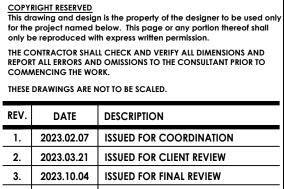
11. PROVIDE CONCEALED DAMPER REGULATORS FOR ALL VOLUME DAMPERS OVER INACCESSIBLE CEILINGS AND SOFFITS.

REMOVE EXISTING CONDENSER. PREPARE PIPING FOR CONNECTION TO NEW CONDENSER.

TEMPORARY SUPPORT DURING CONSTRUCTION.

ROOFTOP SITE IMAGE - DEMOLITION

721 Johnson St Victoria BC, V8W 1M8 T. 250-382-5999 amegroup.ca



4. 2023.10.20 ISSUED FOR CLIENT REVIEW 2023.11.24 ISSUED FOR TENDER

CONSULTANT:

NOT FOR CONSTRUCTION

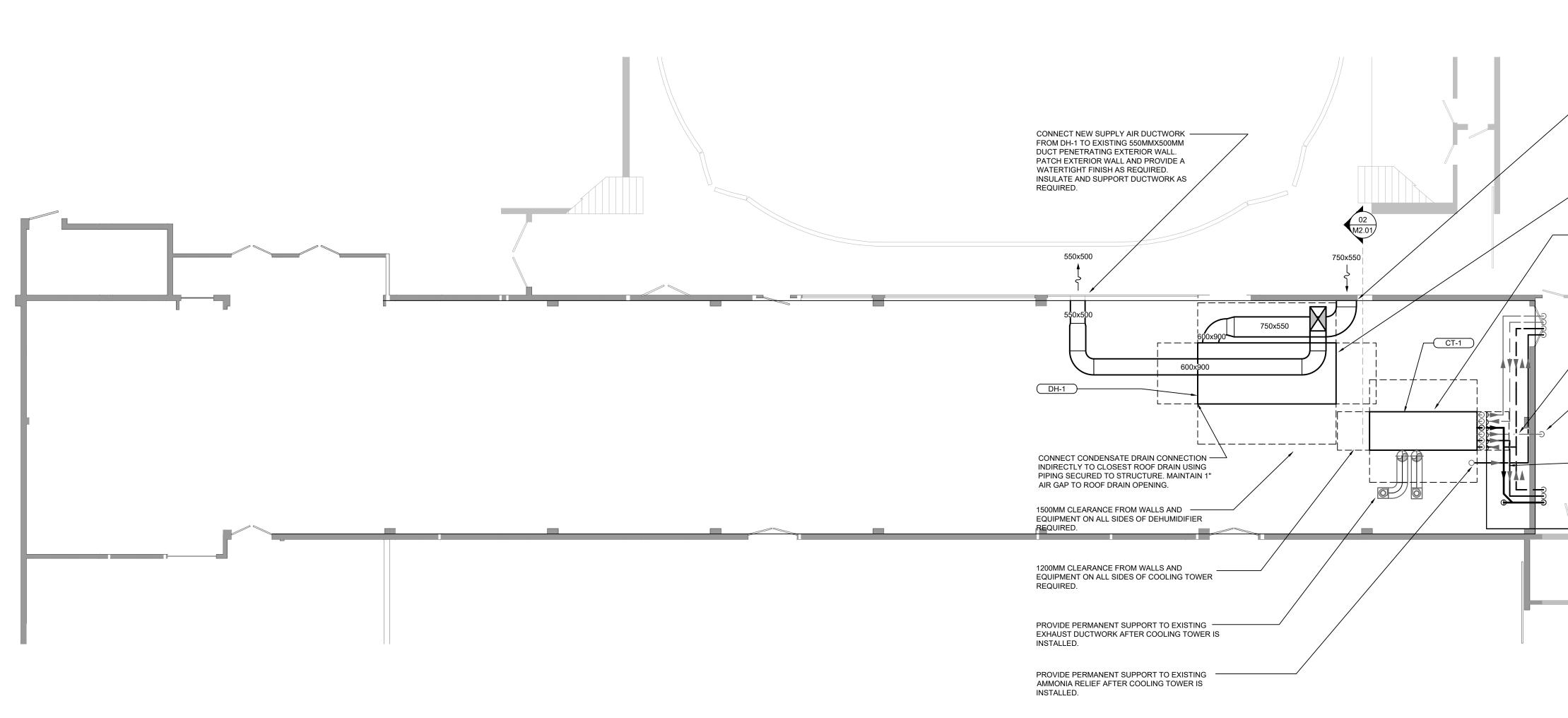
JL

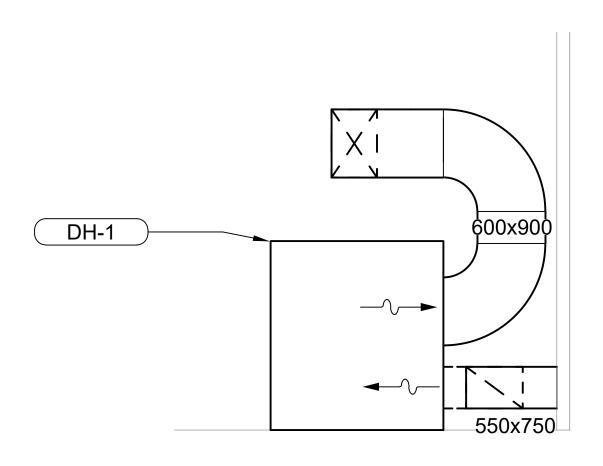
CJB

AS NOTED

November 24, 2023

DRAWING NO.











O3 SANITARY DRAIN LINE LOCATION M2.01 SCALE: NTS

| | AMEGOUP 721 Johnson St Victoria BC, V8W 1M8 T. 250-382-5999 amegroup.ca |
|--|---|
| | COPYRIGHT RESERVED This drawing and design is the property of the designer to be used only for the project named below. This page or any portion thereof shall only be reproduced with express written permission. THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE CONSULTANT PRIOR TO COMMENCING THE WORK. THESE DRAWINGS ARE NOT TO BE SCALED. REV. DATE DESCRIPTION 1. 2023.02.07 ISSUED FOR COORDINATION 2. 2023.03.21 ISSUED FOR CLIENT REVIEW |
| FINISH AS REQUIRED. COMPLETE WITH FLASHING. INSULATE AND SUPPORT DUCTWORK AS REQUIRED AS PER SMACNA. — INSTALL NEW DEHUMIDIFIER ON ROOF CURB. MOUNT ON EXISTING STRUCTURE AS PER | 3. 2023.10.04 ISSUED FOR FINAL REVIEW 4. 2023.10.20 ISSUED FOR CLIENT REVIEW 5. 2023.11.24 ISSUED FOR TENDER |
| STRUCTURAL DRAWINGS. INSTALL NEW CONDENSER CT-1 ON ROOF CURB AS SHOWN. MOUNT ON ROOF AS INDICATED BY | |
| STRUCTURAL DRAWINGS. REFER TO ROOF MANUFACTURER'S REQUIREMENTS AND INSTALL IN A MANNER SO AS TO KEEP THE EXISTING ROOF WARRANTY INTACT. | |
| RE-IN STATE HEAT TRACE, INSULATION, AND ALUMINIUM JACKETING OF DOMESTIC WATER PIPING ONCE NEW CONNECTION HAS BEEN MADE. | |
| RE-CONNECT CHILLED WATER GLYCOL LINES, AMMONIA LIQUID AND VAPOUR LINES AND MAKEUP WATER LINES. CONNECT NEW SANITARY DRAINAGE LINES TO CT-1 AND CONNECT TO EXISTING GRAVITY DRAINAGE LOCATED ON ROOF. CONTRACTOR TO CONFIRM PIPE ROUTING ON SITE. | |
| RE-CONNECT CT-1 AMMONIA RELIEF TO EXISTING AMMONIA RELIEF STACK AS PER MANUFACTURER'S REQUIREMENTS FOR CT-1 AND EXISTING CHILLER PLANT. 50Ø GLYS 50Ø GLYR 75Ø SAN 50Ø DCW AMMS AMMR | |
| | |
| | |
| | CONSULTANT: |
| | |
| | |
| | SEAL: |
| | NOT FOR CONSTRUCTION |
| | PROJECT TITLE: ARCHIE BROWNING SPORTS CENTRE - HVAC REPLACEMENT |
| | PROJECT ADDRESS: 1153 Esquimalt Road, Victoria, BC |
| | DRAWN BY JL CHECKED BY CJB |
| | SCALE AS NOTED DATE November 24, 2023 DRAWING TITLE: NEW EQUIPMENT PLAN |
| | |
| | PROJECT NO. DRAWING NO. 000a-1303-22 M2.01 |

1. GENERAL

1.1 GENERAL SCOPE 'PROVIDE' SHALL MEAN SUPPLY AND INSTALL.

'CONSULTANT' SHALL MEAN AME GROUP CONSULTING PROFESSIONAL ENGINEERS

PROVIDE COMPLETE, FULLY TESTED AND OPERATIONAL SYSTEMS TO MEET THE REQUIREMENTS DESCRIBED HEREIN AND IN COMPLETE ACCORD WITH APPLICABLE CODES AND ORDINANCES. CONTRACT DOCUMENTS AND DRAWINGS ARE DIAGRAMMATIC. THEY ESTABLISH SCOPE, MATERIAL AND INSTALLATION QUALITY BUT ARE NOT DETAILED INSTALLATION INSTRUCTIONS FOLLOW MANUFACTURERS' RECOMMENDED INSTALLATION INSTRUCTIONS, DETAILS AND PROCEDURES

FOR EQUIPMENT, SUPPLEMENTED BY REQUIREMENTS OF THE CONTRACT DOCUMENTS. BEFORE SUBMITTING TENDER, VISIT AND EXAMINE THE SITE AND NOTE ALL CHARACTERISTICS AND FEATURES AFFECTING THE WORK. NO ALLOWANCES WILL BE MADE FOR ANY DIFFICULTIES ENCOUNTERED OR ANY EXPENSES INCURRED BECAUSE OF ANY CONDITIONS OF THE SITE OR ITEM EXISTING THEREON, WHICH IS VISIBLE OR KNOWN TO EXIST AT THE TIME OF TENDER.

CLARIFICATIONS OR REQUESTS FOR ALTERNATE MATERIALS OR EQUIPMENT MUST BE SUBMITTED IN WRITING TO THE CONSULTANT NO LATER THAN SEVEN (7) WORKING DAYS PRIOR TO THE MECHANICAL TRADES' CLOSING TENDER DATE. APPROVAL OF REQUESTS SHALL ONLY BE GIVEN BY ADDENDUM. MAKE REFERENCE TO FLECTRICAL MECHANICAL STRUCTURAL AND ARCHITECTURAL DRAWINGS WHEN SETTING OUT WORK. CONSULT WITH RESPECTIVE DIVISIONS IN SETTING OUT LOCATIONS FOR DUCTWORK, EQUIPMENT, AND PIPING, SO THAT CONFLICTS ARE AVOIDED AND SYMMETRICAL EVEN SPACING IS MAINTAINED. JOINTLY WORK OUT ALL CONFLICTS ON SITE BEFORE FABRICATING OR INSTALLING ANY MATERIALS OR EQUIPMENT.

1.2 CODE COMPLIANCE, PERMITS AND FEES ALL WORK SHALL COMPLY WITH CURRENT EDITIONS OF THE NATIONAL. PROVINCIAL AND MUNICIPAL

CODES, STANDARDS, ACTS AND BYLAWS AND WILL MEET THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.

OBTAIN ALL PERMITS AND PAY ALL FEES APPLICABLE TO THE SCOPE OF WORK. CONTRACTOR SHALL ARRANGE FOR INSPECTIONS OF THE WORK BY THE AUTHORITIES HAVING JURISDICTION AND SHALL PROVIDE CERTIFICATES INDICATING FINAL APPROVAL.

1.3 TENDER PRICE BREAKDOWN

SUBMIT A TENDER PRICE BREAKDOWN WITHIN THIRTY (30) DAYS OF TENDER CLOSING AND BEFORE FIRST PROGRESS CLAIM, IN A FORMAT AGREED TO WITH THE CONSULTANT. AS A MINIMUM INCLUDE EQUIPMENT, MATERIALS AND LABOUR FOR MECHANICAL, PLUMBING, SHEET METAL, FIRE PROTECTION AND CONTROLS.

1.4 SUBMITTALS COMPLY WITH THE FOLLOWING:

CONTRACTOR SHALL PROVIDE AND SUBMIT TO THE CONSULTANT ASSURANCE OF PROFESSIONAL DESIGN AND COMMITMENT FOR FIELD REVIEW SCHEDULE S-B AND ASSURANCE OF PROFESSIONAL FIELD REVIEW AND COMPLIANCE SCHEDULE S-C FOR SEISMIC ENGINEERING

SHOP DRAWINGS: PROVIDE SHOP DRAWINGS FOR ALL EQUIPMENT AS ELECTRONIC FILES (FILE FORMAT DWG. DXF. PDF. OR COMPARABLE). WHEN MANUFACTURER'S CUT SHEETS APPLY TO A PRODUCT SERIES. RATHER THAN A SPECIFIC PRODUCT. THE DATA SPECIFICALLY APPLICABLE TO THE PROJECT SHALL BE HIGHLIGHTED OR CLEARLY INDICATED BY OTHER MEANS. EACH SUBMITTED PIECE OF LITERATURE AND DRAWINGS SHALL CLEARLY REFERENCE THE SPECIFICATION AND/OR DRAWING THAT THE SUBMITTAL IS TO COVER. GENERAL CATALOGS SHALL NOT BE ACCEPTED AS CUT SHEETS TO FULFILL SUBMITTAL REQUIREMENTS

CLOSEOUT SUBMITTALS: PROVIDE A MINIMUM OF TWO (2) MECHANICAL OPERATION AND MAINTENANCE MANUALS AND ONE DIGITAL COPY, PREPARED BY THE TAB CONTRACTOR. OPERATION AND MAINTENANCE MANUAL APPROVED BY, AND FINAL COPIES DEPOSITED WITH THE

CONSULTANT A MINIMUM OF 7-DAYS BEFORE FINAL INSPECTION. OPERATION AND MAINTENANCE MANUAL TO INCLUDE BUT NOT LIMITED TO LAYMAN'S DESCRIPTION OF THE SYSTEMS AND ASSOCIATED CONTROLS: OPERATIONAL INSTRUCTIONS, SERVICING, MAINTENANCE. OPERATION AND TROUBLE-SHOOTING INSTRUCTIONS FOR EACH ITEM OF EQUIPMENT: WARRANTIES: EQUIPMENT MANUFACTURER'S PERFORMANCE DATASHEETS INDICATING POINT OF OPERATION AS LEFT

AFTER COMMISSIONING IS COMPLETE; TESTING, ADJUSTING AND BALANCING REPORTS. SITE RECORDS: CONTRACTOR SHALL MAINTAIN 1 SET OF WHITE PRINTS AT CONTRACTORS COST TO MARK CHANGES AS WORK PROGRESSES AND AS CHANGES OCCUR. USE DIFFERENT COLOUR WATERPROOF INK FOR EACH SERVICE. DO NOT USE PENCIL OR BLACK INK. TRANSFER INFORMATION WEEKLY TO SHOW WORK AS ACTUALLY INSTALLED. DRAWINGS SHALL BE AVAILABLE FOR REFERENCE PURPOSES AND REVIEW.

RECORD DRAWINGS: PRIOR TO START OF TESTING, ADJUSTING AND BALANCING FOR MECHANICAL FINALIZE PRODUCTION OF RECORD DRAWINGS

RECORD DRAWINGS: USE FINAL SITE RECORD TO ELECTRONICALLY PRODUCE CAD AND PDF FILES THUS FORMING A "RECORD DRAWING" SET. IDENTIFY EACH DRAWING IN LOWER RIGHT HAND CORNER IN LETTERS AT LEAST 12 MM HIGH AS FOLLOWS: - "RECORD DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (SIGNATURE OF CONTRACTOR) (DATE). PERFORM TESTING, ADJUSTING AND BALANCING FOR HVAC USING RECORD DRAWINGS, SUBMIT RECORD DRAWINGS TO CONSULTANT FOR APPROVAL AND MAKE CORRECTIONS AS DIRECTED. PERFORM TESTING, ADJUSTING, AND BALANCING FOR HVAC USING RECORD DRAWINGS. PROVIDE COMPLETED

REPRODUCIBLE RECORD DRAWINGS WITH FINAL OPERATING AND MAINTENANCE MANUALS WITHIN TWO (2) WEEKS OF SUBSTANTIAL COMPLETION. FAILURE TO SUBMIT DRAWINGS WILL RESULT IN THE WORK BEING UNDERTAKEN BY THE OWNER AND DEDUCTED FROM THE CONTRACTOR'S HOLD BACK AMOUNT. COST TO TRANSFER RECORD INFORMATION ONTO REPRODUCIBLE MEDIA & AUTO-CAD OR REVIT ARE THIS CONTRACTOR'S RESPONSIBILITY. CONSULTANT WILL RELEASE CAD DRAWINGS TO CONTRACTOR

AFTER SIGNING A COPYRIGHT FORM. SHOULD THE CONTRACTOR CHOOSE TO UTILIZE THIS CONSULTANT FOR TRANSFERRING AS BUILT INFORMATION TO RECORD DRAWINGS, ALLOW \$400 / SHEET FOR ALL DRAWINGS IN THE CONSTRUCTION SET. THIS WILL COVER COSTS FOR DRAFTING TIME & PRINTING COSTS. 1.5 QUALITY OF WORK

ALL WORK SHALL BE BY QUALIFIED TRADESMEN WITH VALID PROVINCIAL TRADE QUALIFICATION

CERTIFICATES. SPOT CHECKS WILL BE MADE BY THE CONSULTANT. WORK WHICH DOES NOT CONFORM TO STANDARDS MAY BE REJECTED BY THE CONSULTANT. THE CONTRACTOR SHALL REDO REJECTED WORK TO THE ACCEPTED STANDARD AT NO COST TO THE OWNER.

1.6 METRIC CONVERSION

ALL UNITS ARE EXPRESSED IN SI UNITS. ON ALL SUBMITTALS (SHOP DRAWINGS ETC.) USE THE SAME SI UNITS AS STATED IN THE SPECIFICATION. WHERE PIPES ARE SPECIFIED WITH METRIC DIMENSIONS AND IMPERIAL SIZED PIPES ARE AVAILABLE, PROVIDE EQUIVALENT NOMINAL IMPERIAL SIZED PIPE AS INDICATED IN THE TABLE. AND PROVIDE AT NO EXTRA COST ADAPTERS TO ENSURE COMPATIBLE CONNECTIONS TO ALL METRIC SIZED FITTINGS. EQUIPMENT AND PIPING

WHEN CSA APPROVED SI METRIC PIPES ARE PROVIDED, THE CONTRACTOR SHALL PROVIDE AT NO EXTRA COST ADAPTERS TO ENSURE COMPATIBLE CONNECTIONS BETWEEN THE SI METRIC PIPES AND ALL NEW

AND EXISTING PIPES, FITTINGS, AND EQUIPMENT. EQUIVALENT NOMINAL DIAMETER OF PIPES

15MM = NPS 1/2 20MM = NPS 3/4 25MM = NPS 1

30MM = NPS 1-1/4 40MM = NPS 1-1/2

50MM = NPS 2 65MM = NPS 2-1/2 75MM = NPS 3

100MM = NPS 4

150MM = NPS 6 200MM = NPS 8

THE METRIC DUCT SIZES ARE EXPRESSED AS 25 MM = 1 INCH.

1.7 DRAWINGS AND SPECIFICATIONS

SHOULD ANY DISCREPANCY APPEAR BETWEEN DRAWINGS AND SPECIFICATIONS OBTAIN WRITTEN CLARIFICATION FROM THE CONSULTANT DURING THE TENDER PERIOD. WITHOUT A WRITTEN CLARIFICATION THE BETTER QUALITY AND/OR GREATER QUANTITY OF WORK OR MATERIALS SHALL BE ESTIMATED, PERFORMED AND FURNISHED WITHIN THE TENDERED PRICE.

1.8 CUTTING, PATCHING AND CORING

PROVIDE HOLES AND SLEEVES, CUTTING AND FITTING REQUIRED FOR MECHANICAL WORK. RELOCATE IMPROPERLY LOCATED HOLES AND SLEEVES. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES. OBTAIN WRITTEN APPROVAL FROM THE STRUCTURAL CONSULTANT BEFORE CUTTING OR BURNING STRUCTURAL MEMBERS

PROVIDE X-RAY OF ALL REQUIRED PENETRATIONS OF THE FLOOR. X-RAY USE FOR LOCATING IN FLOOR REBAR AND CONDUIT TO BE DONE AFTER NORMAL WORKING HOURS. TAKE NECESSARY PRECAUTIONS TO PROTECT COMPUTER EQUIPMENT WHEN X-RAYING FLOORS. COORDINATE WITH OWNER.

1.9 COMPLIANCE WITH ENERGY BY-LAW

ALL EQUIPMENT INSTALLED ON THIS PROJECT SHALL COMPLY WITH THE NATIONAL ENERGY CODE OF CANADA FOR BUILDINGS - 2015, ASHRAE STANDARD 90.1 - 2016. 1.10 INSTALLATION OF EQUIPMENT UNIONS AND FLANGES SHALL BE PROVIDED IN PIPING OR DUCTWORK TO PERMIT EASY REMOVAL OF EQUIPMENT.

MAINTAIN PERMANENT ACCESS TO EQUIPMENT FOR MAINTENANCE.

1.11 CONNECTIONS TO EXISTING SERVICES

MAINTAIN LIAISON WITH THE OWNER AND PROVIDE A MUTUALLY ACCEPTABLE SCHEDULE TO INTERRUPT, REROUTE, OR CONNECT TO EXISTING BUILDING SERVICES WITH THE MINIMUM OF INTERRUPTION OF THOSE SERVICES.

1.12 SELECTIVE DEMOLITION REMOVE FROM SITE ALL EQUIPMENT, DUCTING OR PIPING WHICH IS NO LONGER REQUIRED BECAUSE OF

1.13 EQUIPMENT AND MATERIALS WHERE TWO OR MORE PRODUCTS OF THE SAME TYPE ARE REQUIRED, PRODUCTS SHALL BE OF THE SAME MANUFACTURER.

NOTIFY THE CONSULTANT IN WRITING TEN (10) DAYS PRIOR TO THE TENDER CLOSE, ANY MATERIALS OR EQUIPMENT SPECIFIED WHICH IS NOT CURRENTLY AVAILABLE OR WILL NOT BE AVAILABLE FOR USE AS CALLED FOR HEREIN. FAILING THIS, THE CONTRACT WILL ASSUME THAT THE MOST EXPENSIVE

ALTERNATE HAS BEEN INCLUDED IN THE TENDER PRICE. APPROVED FOUIVALENTS AND/OR ALTERNATIVES TO SPECIFIED PRODUCTS SHALL BE FOUAL TO THE SPECIFIED PRODUCT IN EVERY RESPECT, OPERATE AS INTENDED, AND MEET THE SPACE, CAPACITY, AND NOISE REQUIREMENTS OUTLINED.

THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY ADDITIONAL LABOUR AND MATERIALS REQUIRED BY ANY TRADES OR OTHER CONTRACTORS TO ACCOMMODATE THE USE OF OTHER THAN SPECIFIED MATERIALS OR EQUIPMENT. THE CONTRACTOR SHALL BEAR ANY AND ALL COSTS FOR

DESIGN/SYSTEM MODIFICATIONS TO ACCOMMODATE THE "ALTERNATE" EQUIPMENT. EXTRAS WILL NOT BE APPROVED TO COVER SUCH WORK.

1.14 DELIVERY, STORAGE AND HANDLING

1.16 BALANCING

STORE MATERIALS AND EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS IN A CLEAN, DRY, WELL-VENTILATED AREA.

REPLACE DEFECTIVE OR DAMAGED MATERIALS WITH NEW. 1.15 GUARANTEE / WARRANTY

FURNISH A WRITTEN GUARANTEE STATING THAT ALL WORK EXECUTED IN THIS CONTRACT WILL BE FREE FROM DEFECTIVE WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF

SUBSTANTIAL PERFORMANCE.

THE APPROVED BALANCING AGENCIES ARE: FLOTECH MECHANICAL.

THE APPROVED BALANCING AGENCIES ARE: PERFECTION-AIRE LTD.

BALANCE [TERMINAL BOXES,] [FAN-COIL UNITS,] [HEAT PUMPS,] EXHAUST FANS AND AIR OUTLETS TO AIR QUANTITIES INDICATED ON THE DRAWINGS AND IN THIS SPECIFICATION. WHERE OUTLET QUANTITIES ARE NOT INDICATED, DIVIDE [BOX] [FAN-COIL] [HEAT PUMP] CAPACITY EQUALLY AMONG ALL OUTLETS. SUBMIT IA PDF COPYL OF THE REPORT TO THE CONSULTANT WITHIN TWO (2) WEEKS AFTER SUBSTANTIAL COMPLETION. FAILURE TO SUBMIT THE REPORT WITHIN THE SPECIFIED TIME WILL RESULT IN THE WORK BEING DONE BY THE OWNER AND THE COSTS DEDUCTED FROM FINAL PAYMENT.

BALANCING SHALL BE PERFORMED TO THE FOLLOWING: HYDRONIC-PUMPS AND CENTRAL EQUIPMENT ±5%

COOPERATE WITH THE BALANCING AGENCY AND MAKE ANY CORRECTIONS AS REQUIRED BY BALANCING AGENCY

PROVIDE BALANCING VALVES AS REQUESTED BY THE BALANCING AGENCY AND/OR NECESSARY TO PROPERLY ADJUST OR CORRECT THE SYSTEMS TO DESIGN FLOWS, WITHOUT ADDITIONAL COST TO

1.17 COMMISSIONING AND DEMONSTRATION

BE RESPONSIBLE FOR THE PERFORMANCE AND COMMISSIONING OF ALL EQUIPMENT SUPPLIED AND RE-USED UNDER DIVISIONS 22 AND 23.

CONFIRM OPERATION AND REVIEW CONDITION OF COOLING TOWER AND DEHUMIDIFIER OPERATION, AND ASSOCIATED CONTROL DEVICES IN THE RENOVATED AREA. SUBMIT REPORT NOTING ANY REMEDIAL WORK REQUIRED.

AT THE CONCLUSION OF COMMISSIONING, DEMONSTRATE THE OPERATION OF THE SYSTEMS TO THE CONSULTANT AND THEN TO THE OWNER'S OPERATING STAFF.

AT THE COMPLETION OF THE COMMISSIONING, TESTING, BALANCING AND DEMONSTRATION SUBMIT TO THE CONSULTANT A LETTER CERTIFYING THAT ALL WORK SPECIFIED UNDER THIS CONTRACT IS COMPLETE, CLEAN AND OPERATIONAL IN ACCORDANCE WITH THE SPECIFICATION AND DRAWINGS.

1.18 FLASHING AND ROOF CURBS PROVIDE CURBS. FLASH AND COUNTER FLASH AS REQUIRED WHERE MECHANICAL EQUIPMENT PASSES THROUGH WEATHER OR WATERPROOFED WALLS, FLOORS AND ROOFS. PROVIDE FACTORY ROOF CURBS FOR ALL ROOF MOUNTED EQUIPMENT UNLESS NOTED OTHERWISE.

1.19 SEISMIC CONTROL PROVIDE SEISMIC RESTRAINTS FOR ALL REQUIRED EQUIPMENT, PIPING, AND DUCTWORK IN ACCORDANCE WITH THE LATEST EDITION OF THE SEISMIC RESTRAINTS MANUAL FOR MECHANICAL SYSTEMS PRODUCED BY SMACNA, AND THE LATEST EDITION OF THE ASHRAE APPLICATION HANDBOOK CHAPTER 49 SEISMIC RESTRAINTS

THE CONTRACTOR SHALL RETAIN THE SERVICES OF A QUALIFIED PROFESSIONAL SEISMIC ENGINEER (SEISMIC ENGINEER) REGISTERED IN THE PROVINCE OF BRITISH COLUMBIA. THE SEISMIC ENGINEER SHALL DESIGN AND REVIEW THE INSTALLATION OF ALL SEISMIC RESTRAINTS AS WELL AS MECHANICAL EQUIPMENT AND MECHANICAL SYSTEM SUPPORTS. THE RESTRAINTS AND SUPPORTS SHALL BE SPECIFICALLY DESIGNED TO FASTEN TO THE STRUCTURE INDICATED IN THE CONTRACT DOCUMENTS AND INSTALLED IN THE FIELD. THE COMPLETE DESIGN FOR THESE SYSTEMS SHALL COMPLY WITH ALL APPLICABLE BUILDING CODE REQUIREMENTS.

SEISMIC ENGINEER SHALL PROVIDE AND SUBMIT TO THE OWNER'S CONSULTANT ASSURANCE OF PROFESSIONAL DESIGN AND COMMITMENT FOR FIELD REVIEW SCHEDULE S-B AND ASSURANCE OF PROFESSIONAL FIELD REVIEW AND COMPLIANCE SCHEDULE S-C FOR SEISMIC ENGINEERING SUBMIT SHOP DRAWINGS OF ALL SEISMIC RESTRAINT DETAILS PREPARED AND SEALED BY THE SEISMIC

ENGINEER, PRIOR TO SUBSTANTIAL COMPLETION, THE SEISMIC ENGINEER SHALL VISIT THE SITE AND VERIEV THE SEISMIC RESTRAINT INSTALLATION AS REQUIRED TO SATISFY THE ASSURANCE OF PROFESSIONAL FIELD REVIEW AND COMPLIANCE SCHEDULE C-B OF THE BUILDING CODE. THE CONTRACTOR SHALL OBTAIN APPROVAL FOR THE LOCATION OF ALL RESTRAINT FIXING POINTS FROM

THE STRUCTURAL ENGINEER, ON SITE, PRIOR TO INSTALLATION. WHERE EQUIPMENT IS MOUNTED ON SPRING OR RESILIENT MOUNTS FOR VIBRATION ISOLATION IT SHALL BE THE RESPONSIBILITY OF THE MANUFACTURER OF THE MOUNT TO INCORPORATE SEISMIC RESTRAINT. PROVIDE STEEL FRAME BASES WHERE NECESSARY TO ACHIEVE THIS AND ALSO AVOID OVERTURNING. THE MANUFACTURER SHALL SUPPLY CERTIFICATES. SIGNED BY A PROFESSIONAL ENGINEER. REGISTERED WITHIN THE JURISDICTION, VERIFYING THE DESIGN OF THE SEISMIC RESTRAINTS IS IN ACCORDANCE WITH THIS SECTION.

1.20 VIBRATION ISOLATION

PROVIDE NEOPRENE ISOLATORS FOR DEFLECTIONS 6MM (1/4") AND UNDER. PROVIDE EITHER NEOPRENE OR STEEL SPRING ISOLATORS FOR DEFLECTIONS BETWEEN 6MM AND 12MM

PROVIDE STEEL SPRING ISOLATORS FOR DEFLECTIONS OF 12MM (1/2") AND OVER

PROVIDE ADJUSTABLE LIMIT STOPS FOR SPRING ISOLATION MOUNTS ON EQUIPMENT WITH OPERATING WEIGHTS SUBSTANTIALLY DIFFERENT FROM THE INSTALLED WEIGHTS ALL SPRING ISOLATORS SHALL BE "OPEN SPRING" UNLESS OTHERWISE STATED. SEISMICALLY RATED

HOUSED SPRING ISOLATORS MAY BE USED IN LIEU PROVIDED THAT THEY MEET THIS PROJECT'S REQUIREMENTS FOR SEISMIC RESTRAINT. SELECT ISOLATORS IN ACCORDANCE WITH EQUIPMENT WEIGHT DISTRIBUTION TO ALLOW FOR AN

AVERAGE DEFLECTION MEETING OR EXCEEDING THE SPECIFIED DEFLECTION REQUIREMENTS AND SO THAT NO ISOLATOR HAS A DEFLECTION LESS THAN 80% OF THE STATIC DEFLECTION SPECIFIED. A MINIMUM OF 4 ISOLATORS ARE REQUIRED FOR EACH PIECE OF EQUIPMENT, UNLESS SPECIFIED OTHERWISE

1.21 SUBSTANTIAL AND TOTAL PERFORMANCE

PRIOR TO REQUESTING AN INSPECTION FOR SUBSTANTIAL PERFORMANCE, PROVIDE A COMPLETE LIST OF ITEMS, WHICH ARE DEFICIENT.

A CERTIFICATE OF SUBSTANTIAL PERFORMANCE WILL NOT BE GRANTED UNLESS THE FOLLOWING ITEMS ARE COMPLETED AND AVAILABLE TO THE OWNER'S CONSULTANT: FINAL PLUMBING INSPECTION CERTIFICATE FROM THE AUTHORITY HAVING JURISDICTION.

SCHEDULE S-B & S-B FOR SEISMIC ENGINEERING.

FINAL BACKFLOW PREVENTION TEST REPORTS FOR ALL BACKFLOW DEVICES.

FIRE STOPPING AND FIRE DAMPER TEST LETTER

DRAFT OPERATING/MAINTENANCE MANUALS HAVE BEEN SUBMITTED FOR REVIEW. ALL MECHANICAL SYSTEMS HAVE BEEN COMMISSIONED AND ARE CAPABLE OF OPERATION WITH ALARM CONTROLS FUNCTIONAL AND AUTOMATIC CONTROLS IN OPERATION.

AIR AND WATER SYSTEMS HAVE BEEN BALANCED WITH DRAFT REPORT SUBMITTED TO THE CONSULTANT. OPERATING AND MAINTENANCE DEMONSTRATIONS HAVE BEEN PROVIDED TO THE OWNER.

RECORD DRAWINGS HAVE BEEN SUBMITTED. ALL PREVIOUSLY IDENTIFIED DEFICIENCIES HAVE BEEN CORRECTED AND ACCEPTED.

PRIOR TO A TOTAL PERFORMANCE INSPECTION PROVIDE DECLARATION IN WRITING THAT SUBSTANTIAL

PERFORMANCE DEFICIENCIES HAVE BEEN CORRECTED AND FINAL TAB REPORTS AND O&M MANUALS HAVE BEEN SUBMITTED.

THE CONSULTANT SHALL PROVIDE ONE (1) VISITATION FOR THE PURPOSE OF TOTAL PERFORMANCE INSPECTION. SUBSEQUENT VISITATIONS IF REQUIRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR. 2. PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

LISTED MANUFACTURERS ARE ACCEPTABLE FOR THEIR ABILITY TO MEET THE GENERAL DESIGN INTENT. QUALITY AND PERFORMANCE CHARACTERISTICS OF THE SPECIFIED PRODUCT. THE LIST DOES NOT ENDORSE THE ACCEPTABILITY OF ALL PRODUCTS AVAILABLE FROM THE LISTED

MANUFACTURERS/SUPPLIERS IT REMAINS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THE PRODUCTS SUPPLIED ARE EQUAL TO THE SPECIFIED PRODUCTS IN EVERY RESPECT. OPERATE AS INTENDED. AND MEET THE PERFORMANCE SPECIFICATIONS AND PHYSICAL DIMENSIONS OF THE SPECIFIED PRODUCT.

THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY ADDITIONAL WORK OR MATERIALS. TO ACCOMMODATE THE USE OF EQUIPMENT FROM THE ACCEPTABLE MANUFACTURERS AND SUPPLIERS LISTED.

2.2 PIPE HANGERS AND SUPPORTS

PROVIDE HANGERS AND SUPPORTS TO SECURE EQUIPMENT IN PLACE, PREVENT VIBRATI AGAINST DAMAGE FROM EARTHQUAKE, MAINTAIN GRADE, PROVIDE FOR EXPANSION AND AND ACCOMMODATE INSULATION

PROVIDE GALVANIZED HANGERS AND SUPPORTS FOR ALL PIPING EXCEPT HANGERS AND SHALL BE COPPER PLATED OR EPOXY COATED FOR COPPER PIPING. TOGGLE HANGERS AND/OR STRAP HANGERS SHALL NOT BE USED FOR PIPE HANGERS.

POWER ACTUATED FASTENERS AND "DROP-IN" ANCHORS SHALL NOT BE USED. PROVIDE RING TYPE HANGERS FOR PIPING UP TO NPS 11/2 AND CLEVIS TYPE HANGERS FO NPS 11/2.

2.3 IDENTIFICATION

IDENTIFY PIPING WITH LABELS AND FLOW ARROWS. PROVIDE IDENTIFICATION AT 15M (50) INTERVALS, BEFORE AND AFTER PIPES PASSING THROUGH WALLS. AT ALL SIDES OF TEES ACCESS DOORS. USE BRADY B-500 VINYL CLOTH LABELS FOR NON INSULATED PIPES AND INSULATED PIPES.

PROVIDE 20MM (3/4") DIAMETER BRASS TAGS, SECURE TO VALVE STEMS WITH KEY CHAIN. VALVE DIRECTORY, IN THE O&M MANUALS AND A DIGITAL COPY CROSS REFERENCED WIT ASSOCIATED CONTROLS NOMENCLATURE.

EACH PIECE OF EQUIPMENT SHALL BE IDENTIFIED WITH ITS EQUIPMENT SCHEDULE IDENT SUPPLY FAN SF-1, COOLING COIL CC-1, PUMP P-1 WITH LAMACOID PLATES HAVING 6MM (1 LETTER SIZE.

ACCEPTABLE MANUFACTURERS: BRADY

2.4 VIBRATION ISOLATION

NEOPRENE WASHER/BUSHING: A ONE PIECE MOLDED BRIDGE BEARING NEOPRENE WASH THE BUSHING SHALL SURROUND THE ANCHOR BOLT AND HAVE A FLAT WASHER FACE TO TO METAL CONTACT. USE WASHER/BUSHING ONLY ON LIGHT-WEIGHT EQUIPMENT.

ACCEPTABLE MANUFACTURER: MASON HG HEMI GROMMET OR EQUAL

NEOPRENE PAD ISOLATORS: NEOPRENE OR NEOPRENE / STEEL / NEOPRENE PAD ISOLATOR STATIC DEFLECTION 2.5 MM (0.1") OR GREATER.

ACCEPTABLE MANUFACTURER: MASON WMSW OR EQUAL

SPRING FLOOR MOUNTS: SPRING ISOLATORS BUILT INTO A DUCTILE IRON OR STEEL HOU PROVIDE ALL DIRECTIONAL SEISMIC SNUBBING. THE SNUBBER SHALL BE ADJUSTABLE VE ALLOW A MAXIMUM OF 6MM (1/4") TRAVEL IN ALL DIRECTIONS BEFORE CONTACTING THE SNUBBING COLLARS. MOLDED NEOPRENE CUP OR 1/4" (6MM) NEOPRENE ACOUSTICAL FR BETWEEN THE BASEPLATE AND THE SUPPORT SPRING DIAMETERS SHALL BE NO LESS TI

COMPRESSED HEIGHT OF THE SPRING AT RATED LOAD. SPRINGS SHALL HAVE A MINIMUM TRAVEL TO SOLID EQUAL TO 50% OF THE RATED DEFLECTION.

ACCEPTABLE MANUFACTURER: MASON SSLFH OR EQUAL

3. EXECUTION

3.1 PAINTING REPAIRS AND RESTORATION PRIME AND TOUCH UP MARRED FINISHED PAINTWORK TO MATCH ORIGINAL. RESTORE TO

CONDITION, FINISHES WHICH HAVE BEEN DAMAGED. CLEAN EXPOSED BARE METAL SURFACES SUPPLIED UNDER DIVISIONS 21, 22, 23 AND 25. ONE COAT OF CORROSION RESISTANT PRIMER PAINT TO ALL SUPPORTS AND EQUIPMENT FROM FERROUS METAL.

3.2 DEMONSTRATION

SUPPLY TOOLS, EQUIPMENT, PERSONNEL TO DEMONSTRATE AND INSTRUCT THE OPERAT MAINTENANCE PERSONNEL IN OPERATING. CONTROLLING. ADJUSTING. TROUBLE-SHOOT SERVICING OF ALL SYSTEMS AND EQUIPMENT DURING REGULAR WORK HOURS, PRIOR TO

3.3 PIPE HANGERS AND SUPPORTS PIPE SUPPORT SPACING AND HANGER ROD DIAMETER SHALL BE

| | ND HANGER ROD DIAMETER SHALL DE. |
|---------------------------|--|
| PIPE SIZE: NPS 1/2 | ROD DIAMETER 9MM (3/8"), SPACING 1.8M (6') |
| PIPE SIZE NPS 3/4 TO 11/2 | ROD DIAMETER 9MM (3/8") SPACING 2 4M (8') |

| 3.4 PIPE PRESSURE TESTING | | | | | | |
|---------------------------|---|--|--|--|--|--|
| PIPE SIZE: NPS 6 TO 12 | ROD DIAMETER 22MM (7/8"), SPACING 4.3M (14') | | | | | |
| PIPE SIZE: NPS 3 TO 4 | ROD DIAMETER 16MM (5/8"), SPACING 3.6M (12') | | | | | |
| PIPE SIZE: NPS 2 TO 21/2 | ROD DIAMETER 9MM (3/8"), SPACING 3M (10') | | | | | |
| FIFE SIZE. NFS 5/4 TO 1/2 | ROD DIAINETER SIVINI (3/0), SPACING 2.411 (0) | | | | | |

ADVISE CONSULTANT OR PROJECT MANAGER 48 HOURS MINIMUM PRIOR TO PERFORMAN PRESSURE TESTS. HYDROSTATIC TEST: 150% OF WORKING PRESSURE, BUT NOT LESS THAN 860 KPA (125 P) PIPING DO NOT EXCEED 1034 KPA (150 PSI) FOR PEX PIPING DO NOT EXCEED 690 KPA (1

MAINTAIN TEST PRESSURE WITHOUT LOSS FOR 4 HOURS MINIMUM UNLESS SPECIFIED FO PERIOD OF TIME IN RELEVANT MECHANICAL SECTIONS. PRIOR TO TESTS, ISOLATE EQUIPMENT AND OTHER PARTS WHICH ARE NOT DESIGNED TO TEST PRESSURE OR MEDIA.

CONDUCT TESTS IN PRESENCE OF CONSTRUCTION MANAGER OR PROJECT MANAGER. EXAMINE ALL JOINTS FOR LEAKS AND REMAKE ALL LEAKING JOINTS WITH NEW MATERIAL FOR REPAIRS OR REPLACEMENT, RETESTING, AND MAKING GOOD. CONSULTANT TO DET

WHETHER REPAIR OR REPLACEMENT IS APPROPRIATE. INSULATE OR CONCEAL WORK ONLY AFTER APPROVAL AND CERTIFICATION OF TESTS BY

PRESSURE TEST ALL GAS PIPING IN ACCORDANCE WITH CSA B149.1. PURGE ALL PIPING / PRESSURE TESTS IN ACCORDANCE WITH CSA B149.1. SUBMIT COPIES OF PRESSURE TEST REPORTS FOR ALL SECTIONS OF PIPING.

3.5 ACCESS DOORS

PROVIDE ALL ACCESS DOORS REQUIRED TO ACCESS WORK INSTALLED BY DIVISIONS 21. BE RESPONSIBLE FOR COORDINATING LOCATIONS. CUTTING OPENING AND INSTALLING F SECONDARY SUPPORTS. BLOCKING ETC. WILL BE BY THE CEILING OR WALL CONTRACTOR EQUIPMENT IS WITHIN VIEW AND ACCESSIBLE FOR OPERATING, INSPECTING, ADJUSTING, WITHOUT USING SPECIAL TOOLS.

3.6 VIBRATION ISOLATION

NEOPRENE WASHER/BUSHING: ISOLATE VARIABLE FREQUENCY DRIVE CONTROLLER USIN WASHER/BUSHING ISOLATORS OR SOFT GROMMETS SUCH THAT STRUCTURE BORNE NOIS

TRANSMISSION TO OCCUPIED SPACE IS LESS THAN AIRBORNE NOISE TRANSMISSION. SPRING FLOOR MOUNTS: ISOLATE ALL FLOOR OR PIER MOUNTED EQUIPMENT ON SPRING ISOLATORS, UNLESS OTHERWISE SPECIFIED

| | | | A Johnso | | Group |
|---|---|---|--|--------------|-------------------------------|
| ION. PROTECT | DIVISION 22 PLUMBING | Vi | ctoria BC | , V8W | |
| OCONTRACTION, | 1. GENERAL 1.1 SECTION SCOPE | I. | 250-382- | 5777 | amegroup.ca |
|) SUPPORTS | RE-CONNECTION OF EXISTING DOMESTIC WATER CONNECTIONS AND SANITARY DRAIN CONNECTIONS AS PART OF RE AND RE OF EXISTING COOLING TOWER. REINSTATEMENT OF DRAIN CONNECTIONS FOR NEW DEHUMIDIFIER. | This d for th only l | <u>COPYRIGHT RESERVED</u> This drawing and design is the property of the designer to be used only for the project named below. This page or any portion thereof shall only be reproduced with express written permission. THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND | | |
| OR PIPING OVER | 2. PRODUCTS 2.1 PIPE AND FITTINGS | сом | RT ALL ERRORS AN MENCING THE WO DRAWINGS ARE I | RK. | IS TO THE CONSULTANT PRIOR TO |
| | SANITARY AND STORM DRAINAGE, AND VENT (ABOVE GRADE) SHALL BE DWV COPPER, CAST IRON CLASS 4000, PVC-15 SCHEDULE 40 OR PVC-15XFR SCHEDULE 40. FOR THE INSTALLATION OF PIPING MATERIALS OTHER THAN CAST IRON FOR SANITARY DRAIN, WASTE, | REV. | DATE | DESCRIF | |
| S, BEHIND D B-350 FOR | AND VENT (DWV) SYSTEMS, ALL MANUFACTURER REQUIREMENTS AS A MINIMUM SHALL BE USED FOR THE INSTALLATION OF THE PIPING SYSTEMS INCLUDING RESTRAINED FITTINGS AND ALL OTHER | <u> </u> | 2023.02.07 2023.03.21 | ISSUED | OR COORDINATION |
| I. PROVIDE A TH ANY | MANUFACTURER REQUIREMENTS. | <u>3.</u> <u>4.</u> | 2023.10.04 2023.10.20 | ISSUED | OR FINAL REVIEW |
| TIFICATION, E.G. 1/4") MINIMUM | DOMESTIC WATER (ABOVE GRADE INSIDE BUILDING) SHALL BE: TYPE "K" COPPER FOR HOT AND TYPE "L" COPPER FOR COLD WATER HARD DRAWN SEAMLESS COPPER TUBING TO ASTM B88 WITH CAST BRASS OR WROUGHT COPPER SOLDER JOINT PRESSURE FITTINGS WITH 95/5 SN/SB OR SILVABRITE 100 SOLDER JOINTS. | | 2023.11.24 | | OR TENDER |
| HER/BUSHING. | PRESS TO CONNECT COPPER AND COPPER ALLOY 12MM TO 50MM FITTINGS TO PRESS FITTINGS SHALL CONFORM TO: ASME B16.51, ASTM F3226, IAPMO/ANSI/CAN Z1117. PRESSING TOOLS AND JAWS USED SHALL BE APPROVED FOR USE BY THE FITTING MANUFACTURER. | | | | |
| O AVOID METAL | PUSH TO CONNECT 12MM TO 50MM FITTINGS SUITABLE FOR USE WITH COPPER TUBING AND CERTIFIED TO NSF/ANSI 61, NSF/ANSI 14 AND ASSE 1061 FOR USE WITH POTABLE WATER. LEAD FREE DZR BRASS BODY, EPDM O-RING, STAINLESS STEEL GRAB RING. | | | | |
| ISING TO ERTICALLY AND RESILIENT RICTION PAD | CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE, FITTINGS AND SOLVENT CEMENTS SHALL CONFORM TO CAN/CSA B137.6, SUITABLE FOR POTABLE WATER USE AND CAN/ULC S102.2 LISTED FOR FLAME SPREAD AND SMOKE DEVELOPED RATINGS. TEMPERATURE AND PRESSURE RATINGS SHALL BE SUITABLE FOR THE APPLICATION. ALL TUBING, PIPE FITTINGS AND FITTING ASSEMBLIES SHALL BE BY ONE MANUFACTURER. NATURAL GAS SHALL BE STEEL SCHEDULE 40, A53 GRADE B. | | | | |
| HAN 0.8 OF THE M ADDITIONAL | 2.2 VALVES WHEREVER POSSIBLE ALL VALVES SHALL BE OF ONE MANUFACTURER. GROOVED VALVES SHALL BE OF THE SAME MANUFACTURER AS THE ADJOINING COUPLINGS. | | | | |
|) NEW | PROVIDE VALVES WITH MANUFACTURER'S NAME AND PRESSURE RATING CLEARLY MARKED ON OUTSIDE OF BODY. ALL VALVES MUST BE SUITABLE IN ALL RESPECTS FOR SERVICE USED. ALL VALVES SHALL HAVE A PROVINCIAL CRN NUMBER WHICH IS CURRENT. | | | | |
| APPLY AT LEAST T FABRICATED | BALL VALVES 2 NPS AND UNDER SHALL BE LOW LEAD FORGED BRASS BODY, 2 PIECE BODY, FULL PORT, CHROME PLATED BALL, PTFE SEATS, BLOW OUT PROOF STEM, ADJUSTABLE PACKING NUT, FOR DOMESTIC WATER SERVICE, CLASS 4140 KPA (600 PSI) W.O.G. | | | | |
| TING, AND | GATE VALVES 2 NPS AND UNDER SHALL BE LEAD FREE BRONZE BODY, SOLID WEDGE DISC, BRONZE OR STAINLESS STEEL TRIM, NON-RISING STEM, FOR DOMESTIC WATER SERVICE, CLASS 1380 KPA (200 PSI) W.O.G. | | | | |
| ING, AND O ACCEPTANCE. | STRAINERS SHALL BE ¼ - 2 NPS THREADED ENDS, BRONZE BODY, 1034 KPA (150 PSI) RATING. WATER HAMMER ARRESTORS SHALL BE BELLOWS TYPE WITH WELDED STAINLESS STEEL NESTING BELLOWS OR PISTON STYLE AND STAINLESS STEEL CASING. AIR CHAMBERS ARE UNACCEPTABLE. | | | | |
| | 2.3 PREFORMED PIPE INSULATION MATCH EXISTING DOMESTIC COLD WATER INSULATION THICKNESS AND JACKETING. | | | | |
| | 3. EXECUTION 3.1 PIPING | | | | |
| | PIPE CONNECTIONS NPS 1½ AND LESS SHALL BE SOLDERED OR SCREWED JOINT UNLESS NOTED OTHERWISE | | | | |
| NCE OF | PIPE CONNECTIONS NPS 2 SHALL BE SCREWED JOINT FOR LIQUID SYSTEMS UNLESS NOTED OTHERWISE. PIPE CONNECTIONS NPS $2\frac{1}{2}$ AND LARGER SHALL BE WELDED OR FLANGED UNLESS NOTED OTHERWISE. | | | N | |
| SIG). FOR PP-R 100 PSI). DR LONGER D WITHSTAND | [PUSH TO CONNECT][PRESS TO CONNECT] FITTINGS SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS. USE DIELECTRIC TYPE COUPLINGS WHEN JOINING DISSIMILAR METAL PIPES. USE LEAD FREE SOLDER FOR SOLDERING DOMESTIC WATER COPPER PIPE. | | | | |
| | PROVIDE EXPANSION COMPENSATION FOR ALL FLUID PIPING SYSTEMS. | | | | |
| .S. PAY COSTS ERMINE | 3.2 PRESSURE TESTING ADVISE CONSULTANT OR PROJECT MANAGER 48 HOURS MINIMUM PRIOR TO PERFORMANCE OF PRESSURE TESTS. | | | X | r)- |
| Y AUTHORITIES. AFTER | USE ONLY POTABLE WATER FOR TESTING OF POTABLE WATER SYSTEMS. TEST PRESSURE SHALL BE THE GREATER OF 1.5 TIMES MAXIMUM SYSTEM OPERATING PRESSURE OR 860 KPA FOR 8 HOURS EXCEPT IF THESE PRESSURES EXCEED THE PIPE MANUFACTURER'S RECOMMENDED | | | × | 7 |
| 22, 23 AND 25. | MAXIMUM TEST PRESSURE FOR THE TYPE OF PIPE AND FITTINGS INSTALLED. PRIOR TO TESTS, ISOLATE EQUIPMENT AND OTHER PARTS WHICH ARE NOT DESIGNED TO WITHSTAND TEST PRESSURE OR MEDIA. | CON | ISULTANT: | | |
| PANELS. ANY R. ENSURE THAT , SERVICING | INSULATE OR CONCEAL WORK ONLY AFTER APPROVAL AND CERTIFICATION OF TESTS BY AUTHORITIES. SUBMIT COPIES OF PRESSURE TEST REPORTS FOR ALL SECTIONS OF PIPING. 3.3 GAS DISTRIBUTION PIPING | | | | |
| NG NEOPRENE ISE | DURING CONSTRUCTION, PROTECT ALL OPENINGS IN PIPING AND EQUIPMENT, BY CAPPING OR PLUGGING TO PREVENT ENTRY OF DIRT. CONNECT TO EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTION UNLESS OTHERWISE | | | | |
| G FLOOR MOUNT | INDICATED. SLOPE PIPING DOWN IN DIRECTION OF FLOW TO LOW POINTS. | | | | |
| | USE ECCENTRIC REDUCERS AT PIPE SIZE CHANGE INSTALLED TO PROVIDE POSITIVE DRAINAGE. USE DIELECTRIC TYPE FITTINGS WHERE BURIED SERVICE ENTERS AND CONNECTS TO BUILDING PIPING. 3.4 VALVES | | | | |
| | INSTALL ALL VALVES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. INSTALL VALVES IN ACCESSIBLE LOCATIONS WITH STEMS UPRIGHT OR ANGLED 45° ABOVE HORIZONTAL UNLESS APPROVED OTHERWISE. VALVES MUST BE ACCESSIBLE WITHOUT REMOVING ADJACENT PIPING. INSTALL CONTROL VALVES WITH THEIR STEMS UPRIGHT UNLESS APPROVED OTHERWISE AND WITH ADEQUATE CLEARANCE FOR REMOVAL OF ACTUATORS. PROVIDE STEM EXTENSIONS ON ALL INSULATED VALVES. PROVIDE FULL PORT BALL VALVES IN PIPING 50 MM (2") AND SMALLER AND BUTTERFLY VALVES IN PIPING 65 MM (2-½") AND LARGER FOR SHUT-OFF, EQUIPMENT ISOLATION, THROTTLING, BYPASS OR MANUAL FLOW CONTROL SERVICES. | | OT FC | | CTION |
| | PROVIDE ISOLATION VALVES AT BRANCH TAKE-OFFS, TO ISOLATE EACH PIECE OF EQUIPMENT, UPSTREAM OF ALL METERS, GAUGES, AUTOMATIC AIR VENTS, AND AS INDICATED. | PRO | JECT TITLE: | | |
| | 3.5 PIPING INSULATION MINIMUM THICKNESS SCHEDULE CONTRACTOR TO MATCH EXISTING THICKNESS AS EXISTING. | | | | |
| | 3.6 PIPING FINISH SCHEDULE CONTRACTOR TO MATCH EXISTING THICKNESS AS EXISTING. | | | | ENTRE - LACEMENT |
| | 3.7 SAFES, FLASHING AND VENT TERMINALS PROVIDE FLEXIBLE FLASHING AND METAL COUNTER FLASHING WHERE PIPING PENETRATES WEATHER OR WATERPROOFED WALLS AND FLOORS. | | VAC | | |
| | | PROJECT ADDRESS: 1153 Esquimalt Road, Victoria, BC | | | |
| | | | WN BY | | JL |
| | | CHE SCA | CKED BY | | CJB AS NOTED |
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000a-1303-22 **M3.01**

1. GENERAL

1.1 SYSTEM CLEANING AND CHEMICAL TREATMENT

EMPLOY SERVICES OF THE EXISTING BUILDING'S WATER TREATMENT FIRM OR IF THERE IS NOT ONE, A FIRM SPECIALIZING IN HYDRONIC SYSTEM CHEMICAL TREATMENT. THIS FIRM SHALL SUBMIT A SCHEDULE OF WORK TO BE PERFORMED, CHEMICAL TYPES AND QUANTITY TO BE USED. AT THE COMPLETION OF THE CHEMICAL TREATMENT A REPORT SHALL BE SUBMITTED TO OUTLINE THE WORK PERFORMED AND DETAILS OF PROCEDURES TO BE USED BY THE BUILDING OPERATOR FOR CONTINUED WATER QUALITY TESTING AND CHEMICAL TREATMENT.

PROVIDE TEST KITS AS REQUIRED ALONG WITH ADEQUATE CHEMICALS AND REAGENTS FOR ONE YEAR OF TESTING. APPROPRIATE TEST KITS WILL BE PROVIDED TO PROPERLY TEST EACH SYSTEM INSTALLED UNDER THIS CONTRACT

CLEAN AND FLUSH ALL NEW HOT AND COLD CLOSED LOOP WATER SYSTEM PIPING. PROVIDE A CERTIFICATE FOR THIS WORK.

1.2 PERMITS AND QUALIFICATIONS

.1 ENSURE THAT A PERMIT IS OBTAINED BEFORE ANYONE COMMENCES TO INSTALL OR ALTER ANY REFRIGERATION SYSTEM

.2 EVERY PERSON WHO INSTALLS OR MAKES ALTERATIONS OR REPAIRS TO A REFRIGERATION SYSTEM SHALL BE THE HOLDER OF A VALID AND SUBSISTING REFRIGERATION CONTRACTOR'S LICENSE AND ALL PERSONS REPAIRING EQUIPMENT WITH ODS/CFC'S SHALL HAVE COMPLETED AN ENVIRONMENT CANADA APPROVED TRAINING PROGRAM.

1.3 PERFORMANCE REQUIREMENTS

.1 LINE TEST PRESSURE FOR REFRIGERANT R717

- .1 HOT-GAS AND LIQUID LINES: 150 PSIG.
- 1.4 ACTION AND INFORMATIONAL SUBMITTALS
- .1 SUBMIT IN ACCORDANCE WITH SUBMITTAL PROCEDURES. .2 PRODUCT DATA:

.1 SUBMIT MANUFACTURER'S INSTRUCTIONS, PRINTED PRODUCT LITERATURE AND DATA SHEETS

FOR REFRIGERANT PIPING, FITTINGS AND INCLUDE PRODUCT CHARACTERISTICS, PERFORMANCE CRITERIA, PHYSICAL SIZE, FINISH, AND LIMITATIONS. 2 SUBMIT [2] COPIES OF WHMIS MSDS IN ACCORDANCE WITH SECTION 01 35 29.06 - HEALTH AND

SAFETY REQUIREMENTS. INDICATE VOC'S FOR ADHESIVE AND SOLVENTS DURING APPLICATION AND .3 CERTIFICATES: SUBMIT CERTIFICATES SIGNED BY MANUFACTURER CERTIFYING THAT MATERIALS

COMPLY WITH SPECIFIED PERFORMANCE CHARACTERISTICS AND PHYSICAL PROPERTIES. 1.5 CLOSEOUT SUBMITTALS

.1 SUBMIT IN ACCORDANCE WITH - CLOSEOUT SUBMITTALS.

.2 OPERATION AND MAINTENANCE DATA: SUBMIT OPERATION AND MAINTENANCE DATA FOR REFRIGERANT PIPING FOR INCORPORATION INTO MANUAL.

1.6 DELIVERY, STORAGE AND HANDLING

.1 DELIVER, STORE AND HANDLE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS. 2 DELIVERY AND ACCEPTANCE REQUIREMENTS: DELIVER MATERIALS TO SITE IN ORIGINAL FACTORY PACKAGING, LABELLED WITH MANUFACTURER'S NAME AND ADDRESS.

.3 STORAGE AND HANDLING REQUIREMENTS: .1 STORE MATERIALS OFF GROUND AND IN ACCORDANCE WITH MANUFACTURER'S

RECOMMENDATIONS IN CLEAN, DRY, WELL-VENTILATED AREA. .2 STORE AND PROTECT REFRIGERANT PIPING, FITTINGS, AND EQUIPMENT FROM NICKS, SCRATCHES, AND BLEMISHES.

.3 REPLACE DEFECTIVE OR DAMAGED MATERIALS WITH NEW.

2. PRODUCTS

2.1 DUCTWORK AND ACCESSORIES

PROVIDE DUCTWORK CONSTRUCTED, REINFORCED, SEALED, AND INSTALLED TO WITHSTAND 1-1/2 TIMES THE WORKING STATIC PRESSURE.

PROVIDE LOW PRESSURE DUCTWORK 500 PA (2" W.G.) FOR SUPPLY DUCTWORK AND PLENUMS ON SYSTEMS WITHOUT TERMINAL MIXING BOXES OR AIR VALVES, SUPPLY DUCTWORK DOWNSTREAM FROM TERMINAL MIXING BOXES OR AIR VALVES, OUTDOOR AIR DUCTWORK AND PLENUMS, RETURN AIR DUCTWORK AND PLENUMS, EXHAUST AND RELIEF AIR DUCTWORK AND PLENUMS, UNLESS NOTED OTHERWISE

LOW PRESSURE INSULATED FLEXIBLE DUCTWORK SHALL BE EQUAL TO THERMAFLEX TYPE M-KC. 2.2 DUCT SEALING

DUCT SEALING LOW PRESSURE DUCTWORK 500 PA (2" W.G.) AND UNDER SHALL BE SMACNA SEAL CLASS A. SEAL ALL SUPPLY, RETURN AND EXHAUST DUCT JOINTS, LONGITUDINAL AS WELL AS TRANSVERSE JOINTS AS FOLLOWS

SLIP JOINTS: APPLY HEAVY BRUSH-ON HIGH PRESSURE DUCT SEALANT. APPLY SECOND APPLICATION AFTER THE FIRST APPLICATION HAS COMPLETELY DRIED OUT. WHERE METAL CLEARANCE EXCEEDS 1.5 MM (1/16") USE HEAVY MASTIC TYPE SEALAN

FLANGED JOINTS: SOFT ELASTOMER BUTYL OR EXTRUDED FORM OF SEALANT BETWEEN FLANGES FOLLOWED BY AN APPLICATION OF HEAVY BRUSH-ON HIGH PRESSURE DUCT SEALANT. OTHER JOINTS: HEAVY MASTIC TYPE SEALANT.

DUCT TAPES AS A SEALING METHOD ARE NOT PERMITTED.

DO NOT INSULATE ANY SECTION OF THE DUCTWORK UNTIL IT HAS BEEN INSPECTED AND APPROVED OF DUCT SEALANT APPLICATION, BY THE CONSULTANT.

2.3 DUCT HANGERS AND SUPPORTS

HANGERS AND SUPPORTS TO SMACNA STANDARDS.

STRAP HANGERS: OF SAME MATERIAL AS DUCT BUT NEXT SHEET METAL THICKNESS HEAVIER THAN

MAXIMUM SIZE DUCT SUPPORTED BY STRAP HANGER: 500 MM.

HANGERS: GALVANIZED STEEL ANGLE WITH GALVANIZED STEEL RODS TO SMACNA. TOGGLE HANGERS AND/OR STRAP HANGERS SHALL NOT BE USED.

POWER ACTUATED FASTENERS AND "DROP-IN" ANCHORS SHALL NOT BE USED.

2.4 PIPING

CHILLED WATER SHALL BE STEEL SCHEDULE 40, A53 GRADE B. AMMONIA PIPING AND WELD MATERIAL SHALL MATCH EXISTING PIPING. CONTRACTOR TO CONFIRM ONSITE. REFRIGERANT PIPING SHALL BE ACR COPPER. AMMONIA PIPING AND WELD MATERIAL SHALL MATCH

EXISTING PIPING. CONTRACTOR TO CONFIRM ONSITE. PIPE CONNECTIONS UNLESS NOTED OTHERWISE SHALL BE: NPS 11/2 AND LESS: SCREWED JOINT STEEL

PIPING, NPS 2: SCREWED JOINT FOR LIQUID SYSTEMS, WELD JOINT FOR AIR OR GAS SYSTEMS, NPS 23 AND LARGER: WELD OR FLANGED PIPING INCLUDING BRANCH CONNECTIONS. USE DIELECTRIC TYPE COUPLINGS WHEN JOINING DISSIMILAR METAL PIPES.

USE LEAD FREE SOLDER FOR SOLDERING DOMESTIC WATER COPPER PIPE.

2.5 VALVES

OR EQUAL.

WHEREVER POSSIBLE ALL VALVES SHALL BE OF ONE MANUFACTURER.

GROOVED VALVES SHALL BE OF THE SAME MANUFACTURER AS THE ADJOINING COUPLINGS. PROVIDE VALVES WITH MANUFACTURER'S NAME AND PRESSURE RATING CLEARLY MARKED ON OUTSI OF BODY. ALL VALVES MUST BE SUITABLE IN ALL RESPECTS FOR SERVICE USED. ALL VALVES SHALL HAVE A PROVINCIAL CRN NUMBER WHICH IS CURRENT.

USE NON-RISING STEM VALVES ONLY WHERE THERE IS INSUFFICIENT CLEARANCE FOR STEM TO RISE. GATE VALVES NPS 2 AND UNDER SHALL BE BRONZE BODY, RISING STEM, SOLID WEDGE DISC, UNION C SCREWED BONNET, SCREWED ENDS, CLASS 2070 KPA (300 PSI) W.O.G. TOYO/RED & WHITE 298 OR EQU GATE VALVES NPS 2-1/2 AND OVER SHALL BE CAST IRON BODY, RISING STEM, O.S. & Y, SOLID WEDGE DISC, BRONZE TRIM, BOLTED BONNET, FLANGED ENDS, CLASS 1033 KPA (150 PSI) W.O.G. TOYO/RED & WHITE 421

2.6 DUCT AND BREECHING INSULATION EXPOSED RECTANGULAR DUCTS: EXTERNAL RIGID INSULATION, SERVICE TEMPERATURE 5°C TO 232°C (41°F TO 450°F), MINERAL FIBER BOARD FOR LOW AND MEDIUM TEMPERATURE APPLICATIONS, ALL SERVICE ALUMINUM FOIL-SCRIM KRAFT (FSK) VAPOUR BARRIER JACKET WITH GLASS FIBRE REINFORCEMENT, FACTORY APPLIED. DENSITY 36KG/M3 (2.25 PCF), MINIMUM RSI 0.76/25MM (R 4.3/IN)

2.7 DUCTWORK FINISH JACKETS

ALUMINUM JACKET: 51 MIL (22 GA.) THICK STUCCO OR SMOOTH ALUMINUM JACKETING WITH LONGITUDINAL SLIP JOINTS AND 50MM (2") END LAPS WITH FACTORY APPLIED PROTECTIVE LINER ON INTERIOR SURFACE.

2.8 PIPING FINISH JACKETS

PAINT GLYCOL AND AMMONIA PIPING TO MATCH EXISTING.

2.9 EQUIPMENT ALL EQUIPMENT SHALL BE CSA APPROVED FOR ITS INTENDED USE.

.2 PART OF REFRIGERATION SYSTEMS THAT ARE EXEMPTED FROM REGISTRATION BY CSA B52-2018. .3 REGISTRATION SHALL ALSO BE IN COMPLIANCE WITH THE REQUIREMENTS OF TECHNICAL SAFETY BC. 2.11 STEEL PIPING .1 ASTM A 53/A 53M, BLACK STEEL WITH PLAIN ENDS. 2.12 REFRIGERANT TUBE SUPPORTS .1 MIDDLE ATTACHMENTS (ROD) .1 CARBON STEEL BLACK (ELECTRO-GALVANIZED FOR MECHANICAL ROOMS) CONTINUOUS THREADED ROD - ANVIL FIG. 146 MYATT FIG. 434. .2 PIPE HANGERS: .1 UNINSULATED PIPE, UP TO 1-1/4" - GRINNELL 97C. .2 INSULATED PIPE, UP TO NPS 1 - GRINNELL FIG. 269 OR MYATT FIG. 120. .3 INSULATED PIPE, NPS 1-1/4 - ANVIL FIGS. 65 OR 260 OR MYATT FIGS. 122 OR 124. .4 MAXIMUM HORIZONTAL PIPE HANGER SPACING: Pipe Size Maximum Spacing Rod Diameter up to NPS 3/4 1.5 m [5 ft] 10 mm [3/8"] NPS 1 & NPS 1¼ 1.8 m [6 ft] 10 mm [3/8"] .3 WALL SUPPORTS: .1 HORIZONTAL PIPE ADJACENT TO WALL; ANGLE IRON WALL BRACKETS WITH SPECIFIED HANGERS .2 VERTICAL PIPE ADJACENT TO WALL; EXPOSED PIPE WALL SUPPORT FOR LATERAL MOVEMENT RESTRAINT - ANVIL FIG. 262. .4 NOTE: .1 COLD SERVICES - REFRIGERANT SUCTION LINES. 3. EXECUTION 3.1 DUCTWORK AND ACCESSORIES FABRICATE DUCTWORK IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS - METAL, NFPA 90A STANDARD FOR THE INSTALLATION OF AIR-CONDITIONING AND VENTILATING SYSTEMS, AND NFPA 90B STANDARD FOR THE INSTALLATION OF WARM AIR HEATING AND AIR-CONDITIONING SYSTEMS

PRIOR TO FABRICATION OF DUCTWORK, CHECK ALL SPACES AND HEIGHTS AND CONFLICTS WITH OTHER

TRADES DUCT SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS. FOR ACOUSTICALLY LINED OR INTERNALLY INSULATED DUCTS ALLOW FOR INSULATION THICKNESS AND MAINTAIN INTERIOR CLEAR DIMENSIONS INDICATED. PROVIDE A FLEXIBLE CONNECTION WHERE LOW PRESSURE DUCTS ARE CONNECTED TO FAN EQUIPMENT, TERMINAL BOXES OR ANY OTHER APPARATUS. JOINT SHALL BE SCREWED OR BOLTED FLEXIBLE GASKETED JOINT, MINIMUM 50MM (2") WIDE. PROVIDE DUCT HANGERS AND SUPPORTS IN ACCORDANCE WITH SMACNA MANUALS. DUCTWORK SHALL BE GALVANIZED STEEL UNLESS NOTED OTHERWISE. 3.2 DUCT HANGERS AND SUPPORTS

DUCT SUPPORT SHALL BE:

UP TO 750MM DUCT SIZE: ANGLE SIZE 25X25X3 MM WITH 6MM ROD SIZE 751 TO 1050MM DUCT SIZE: ANGLE SIZE 40X40X3 MM WITH 6MM ROD SIZE 1051 TO 1500MM DUCT SIZE: ANGLE SIZE 40X40X3 MM WITH 10MM ROD SIZE 1501 TO 2100MM DUCT SIZE: ANGLE SIZE 50X50X3 MM WITH 10MM ROD SIZE 2101 TO 2400MM DUCT SIZE: ANGLE SIZE 50X50X5 MM WITH 10MM ROD SIZE 2401 AND OVER DUCT SIZE: ANGLE SIZE 50X50X6 MM WITH 10MM ROD SIZE FABRICATED SUPPORTS ATTACHED TO THE ROOF STRUCTURE.

3.3 EXPANSION COMPENSATION

PROVIDE STRUCTURAL WORK AND FOURIDMENT REQUIRED FOR EXPANSION AND CONTRACTION OF ALL PIPING. PROVIDE ANCHORS, GUIDES, AND EXPANSION JOINTS AS REQUIRED TO ADEQUATELY PROTECT THE PIPING SYSTEMS.

PROVIDE EXPANSION COMPENSATION FOR ALL PIPING SYSTEMS INCLUDING BUT NOT LIMITED TO: CHILLED WATER, AND ALL OTHER PIPING SYSTEMS THAT OPERATE AT VARYING TEMPERATURES. ALL PIPING SHALL BE ANCHORED AND SUPPORTED IN SUCH A MANNER THAT STRAIN AND/OR WEIGHT DOES NOT COME UPON ANY APPARATUS AND PIPE BRANCH CONNECTIONS. EXPANSION JOINTS AND COMPENSATORS SHALL BE INSTALLED AND GUIDED AS PER MANUFACTURER'S RECOMMENDATIONS. ALL EQUIPMENT SHALL BE CONNECTED WITH UNIONS OR FLANGES TO PROVIDE FOR EASY REMOVAL. WHERE PIPING PASSES THROUGH WALLS OR FLOOR SLABS, THE SLEEVES SHALL BE OF SUFFICIENT SIZE TO ACCOMMODATE THE EXPANSION AND THE PIPE INSULATION, WITHOUT BINDING OR CRUSHING THE INSULATION OR PREVENTING THE EXPANSION OF THE PIPING.

3.4 VALVES

INSTALL VALVES IN ACCESSIBLE LOCATIONS WITH STEMS UPRIGHT OR ANGLED 45° ABOVE HORIZONTAL UNLESS APPROVED OTHERWISE. VALVES MUST BE ACCESSIBLE WITHOUT REMOVING ADJACENT PIPING.

PROVIDE BALL VALVES IN PIPING NPS 2 AND SMALLER AND GATE VALVES IN PIPING NPS 2-1/2 AND LARGER FOR SHUT-OFF, EQUIPMENT ISOLATION, THROTTLING, BYPASS OR MANUAL FLOW CONTROL SERVICES. BALL VALVES USED FOR SHUT-OFF / ISOLATION SHALL BE FULL PORT.

3.5 DUCT AND BREECHING INSULATION

INSTALL ALL DUCTWORK INSULATION TO THE THERMAL INSULATION ASSOCIATION OF CANADA BEST PRACTICES GUIDE.

DUCT INSULATION MINIMUM THICKNESS TABLE (ASHRAE 90.1 ZONE 5 AND 6)

| | Rigid Exterior Duct Insulation | | | | | | | |
|----------|---|-------------|--|------------------------|----------|--|--|--|
| EL 2½ | Duty | Plenum(4) | Duct Location | | | | | |
| | | | Interior | | Exterior | | | |
| | | | Conditioned Space | Unconditioned Space | | | | |
| | | Minimum In | Minimum Insulation Thickness in mm (in.) | | | | | |
| | Cooling Only Air Supply | 25 (1") | 25 (1") | 40 (1-1/2") | 50 (2") | | | |
| | Heating or H/C Air Supply | 25 (1") | 25 (1") | 40 (1-1/2") | 75 (3") | | | |
| | Outdoor Air Supply | 40 (1-1/2") | 40 (1-1/2") | 40 (1-1/2") | 0 | | | |
| | Combustion Air | 40 (1-1/2") | 40 (1-1/2") | 40 (1-1/2") | 0 | | | |
| SIDE | Return Air | 0 | 0 | 40 (1-1/2") | 75 (3") | | | |
| | Exhaust Air (1)(2) | 0 | 0 | 25 (1*) | 25 (1") | | | |
| | Grease Hood Exhaust (5) | N/A | 40 (1-1/2") | 40 (1-1/2") | 0 | | | |
| iE. | Tempered Air Supply or Makeup Air | 0 | 0 | 40 (1-1/2") | 75 (3") | | | |
| OR | Mixed Air (3) | 25 (1") | 25 (1") | 40 (1-1/2") | 75 (3") | | | |
| QUAL. | See note (6) for factory installed duct and plenums | | | | | | | |
| | L | | | | | | | |

| Duty | Plenum(4) | Duct Location | | | | |
|--------------------------------------|--|----------------------|------------------------|------------|--|--|
| | | Interior | Exterior | | | |
| | | Conditioned Space | Unconditioned Space | | | |
| | Minimum Insulation Thickness in mm (in.) | | | | | |
| Cooling Only Air Supply | 25 (1") | 25 (1") | 56 (2-3/16") | 75 (3") | | |
| Heating or H/C Air Supply | 25 (1") | 25 (1") | 56 (2-3/16") | 115 (4.5" | | |
| Outdoor Air Supply | 50 (2") | 50 (2") | 56 (2-3/16") | 0 | | |
| Combustion Air | 50 (2") | 50 (2") | 56 (2-3/16") | 0 | | |
| Return Air | 0 | 0 | 56 (2-3/16") | 115 (4.5" | | |
| Exhaust Air (1)(2) | 0 | 0 | 40 (1-1/2") | 40 (1-1/2' | | |
| Grease Hood Exhaust (5) | N/A | 40 (1-1/2") | 40 (1-1/2") | 0 | | |
| Tempered Air Supply or Makeup Air | 0 | 0 | 56 (2-3/16") | 115 (4.5" | | |
| Mixed Air (3) | 40 (1-1/2") | 40 (1-1/2") | 56 (2-3/16") | 115 (4.5" | | |

NOTE (1): AIR TEMPERATURES 15°C TO 49°C (60°F TO 120°F).

NOTE (2): PROVIDE 38MM (1-1/2") FLEXIBLE DUCT INSULATION ON ALL EXHAUST AIR DUCTWO OUTSIDE WALL OR ROOF TO DAMPER BUT A MINIMUM OF 1.5 M (5 FT.) INSIDE BUILDING. NOTE (3): MIXED AIR INCLUDES TEMPERED AIR DOWNSTREAM OF HEAT RECOVERY UNITS.

NOTE (4): PLENUMS LOCATED OUTSIDE THE BUILDING SHALL BE INSULATED TO THE VALUE THE EXTERIOR COLUMN NOTE (5): PROVIDES 1 HOUR FIRE RATING. THICKNESS SHALL BE DOUBLED FOR 2 HOUR AF

NOTE (6): FACTORY INSTALLED DUCTWORK AND PLENUMS PROVIDED WITH EQUIPMENT NE COMPLY WITH THIS TABLE PROVIDED THEY MEET THE REQUIREMENTS OF THE RELEVANT FOR THAT EQUIPMENT AND IS INSULATED TO RSI 0.58 (R3.3) OR GREATER. REFER TO NECE 5.2.12.1 FOR RELEVANT CSA STANDARDS.

3.6 DUCT FINISHES TABLE

OUTDOORS; ALUMINUM JACKET AS PER TIAC CODE CRF/3 - CRD/3

3.7 PIPING INSULATION MINIMUM THICKNESS SCHEDULE (ASHRAE 90.1)

CHILLED WATER AND REFRIGERANT PIPING IN AN UNCONDITIONED SPACE OR EXTERIOR T BUILDING: MATCH EXISTING.

3.8 PIPING FINISH SCHEDULE

PAINTED TO MATCH EXISTING.

3.9 EXAMINATION

- .1 VERIFICATION OF CONDITIONS: VERIFY THAT CONDITIONS OF SUBSTRATE PREVIOUS UNDER OTHER SECTIONS OR CONTRACTS ARE ACCEPTABLE FOR REFRIC INSTALLATION IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS. .1 VISUALLY INSPECT SUBSTRATE
- INFORM CONSULTANT OF UNACCEPTABLE CONDITIONS IMMEDIATELY UPON DISCOVE PROCEED WITH INSTALLATION ONLY AFTER UNACCEPTABLE CONDITIONS HAVE BEEN AND AFTER RECEIPT OF WRITTEN APPROVAL TO PROCEED CONSULTANT.

3.10 MANUFACTURER'S INSTRUCTIONS

.1 COMPLIANCE: COMPLY WITH MANUFACTURER'S WRITTEN RECOMMEN SPECIFICATIONS, INCLUDING PRODUCT TECHNICAL BULLETINS, HANDLING, INSTALLATION INSTRUCTIONS, AND DATASHEET.

3.11 GENERAL .1 INSTALL IN ACCORDANCE WITH CSA B52, EPS1/RA/1 AND ASME B31.5 SECTION 23 INSTALLATION REQUIREMENTS FOR HVAC PIPEWORK.

3.12 PIPING INSTALLATION

.1 GENERAL

.1 TUBING SHALL BE CUT SQUARE AND HAVE ALL BURRS REMOVED.

PIPING SHALL BE KEPT METICULOUSLY CLEAN. ALL CLEANED PIPING IN THE PROCES ERECTION, WHETHER INSTALLED OR AWAITING INSTALLATION SHALL BE CAPPED OR PLUG PIPING SHALL BE INSTALLED IN TRUE VERTICAL AND HORIZONTAL PLANES CLOSE TO CEILINGS, WITH SPECIFIED PITCH. PROVIDE SUITABLE OFFSETS TO ACCOUNT FOR EXPANSION .4 PIPING CONNECTIONS TO EQUIPMENT AND TERMINAL APPARATUS SHALL BE SUPPOR INDEPENDENTLY AND ARRANGED TO GIVE EASY ACCESS FOR MAINTENANCE.

5 SELECT SYSTEM COMPONENTS WITH PRESSURE RATING EQUAL TO OR GREATER TH/ OPERATING PRESSURE. .2 HOT GAS LINES:

.1 PITCH AT LEAST 1:240 DOWN IN DIRECTION OF FLOW TO PREVENT OI COMPRESSOR DURING OPERATION. .2 PROVIDE INVERTED DEEP TRAP AT TOP OF RISERS.

.3 SAFETY-RELIEF-VALVE DISCHARGE PIPING:

.1 SAFETY RELIEF PIPING IS ONLY TO BE MODIFIED IF NECESSARY. INTENT IS NO

THIS PIPING OVER THE COURSE OF WORK. .2 SCHEDULE 40, BLACK-STEEL AND WROUGHT-STEEL FITTINGS WITH WELDED JOINTS. JOINTS ACCORDING TO AWS D10.12/D10.12M.

.4 EXPANSION COMPENSATION

.1 PIPING IS TO BE INSTALLED WITH SUFFICIENT COMPONENTS TO ALLOW FO COMPENSATION AND PIPE MOVEMENT. PRODUCTS USED FOR REFRIGERANT MANUFACTURED SPECIFICALLY FOR THIS APPLICATION. EXPANSION SYSTEMS INSTALLED WITH APPROPRIATE ANCHORS AND GUIDES TO ALLOW MOVEMENT A

3.13 PRESSURE AND LEAK TESTING

.1 CLOSE VALVES ON FACTORY CHARGED EQUIPMENT AND OTHER EQUIPMENT NOT TEST PRESSURES. .2 LEAK TEST TO CSA B52 BEFORE EVACUATION TO 2 MPA AND 1 MPA ON HIGH AND LOW

RESPECTIVEL .3 TEST PROCEDURE: BUILD PRESSURE UP TO 35 KPA WITH REFRIGERANT GAS ON HIG SIDES. SUPPLEMENT WITH NITROGEN TO REQUIRED TEST PRESSURE. TEST FOR LEAKS W ELECTRONIC OR HALIDE DETECTOR. REPAIR LEAKS AND REPEAT TESTS.

3.14 FIELD QUALITY CONTROL

.1 SITE TESTS/INSPECTION:

.1 CLOSE SERVICE VALVES ON FACTORY CHARGED EQUIPMENT .2 AMBIENT TEMPERATURES TO BE AT LEAST 13 DEGREES C FOR AT LEAST 12 HOUR

DURING DEHYDRATION. .3 USE COPPER LINES OF LARGEST PRACTICAL SIZE TO REDUCE EVACUATION TIME. .4 USE TWO-STAGE VACUUM PUMP WITH GAS BALLAST ON 2ND STAGE CAPABLE OF PUL

ABSOLUTE AND FILLED WITH DEHYDRATED OIL. .5 MEASURE SYSTEM PRESSURE WITH VACUUM GAUGE. TAKE READINGS WITH VALVE VACUUM PUMP AND SYSTEM CLOSED. .6 TRIPLE EVACUATE SYSTEM COMPONENTS CONTAINING GASES OTHER THAN CORREC

REFRIGERANT OR HAVING LOST HOLDING CHARGE AS FOLLOWS: .1 TWICE TO 14 PA ABSOLUTE AND HOLD FOR 4 HOURS.

- BREAK VACUUM WITH REFRIGERANT TO 14 KPA.
- FINAL TO 5 PA ABSOLUTE AND HOLD FOR AT LEAST 12 HOURS.
- .4 ISOLATE PUMP FROM SYSTEM, RECORD VACUUM, AND TIME READINGS UNTIL STABILIZ VACUUM.
- .5 SUBMIT TEST RESULTS TO CONSULTANT.
- .7 ALL DAMAGED OR DEFECTIVE COMPONENTS SHALL BE REPLACED WIT RECONDITIONED) COMPONENTS. A CRACKED OR DEFECTIVE TUBE SHALL BE R DEFECT OF ANY DESCRIPTION OCCURS IN AN INSULATED TUBE, THE INSULAT STRIPPED TO LOCALIZE THE LEAK. THE AMOUNT OF INSULATION SO STRIPF REPLACED WITH NEW - TO BE FINISHED AS SPECIFIED

CHARGING: .1 CHARGE SYSTEM THROUGH FILTER-DRIER AND CHARGING VALVE ON HIGH S CHARGING NOT PERMITTED.

WITH COMPRESSORS OFF, CHARGE ONLY AMOUNT NECESSARY FOR PROPER OPER/ SYSTEM. IF SYSTEM PRESSURES EQUALIZE BEFORE SYSTEM IS FULLY CHARGED. CLOSE VALVE AND START UP. WITH UNIT OPERATING, ADD REMAINDER OF CHARGE TO SYSTEM. .3 RE-PURGE CHARGING LINE IF REFRIGERANT CONTAINER IS CHANGED DURING CHARG

.9 CHECKS:

.1 MAKE CHECKS AND MEASUREMENTS AS PER MANUFACTURER'S OPE MAINTENANCE INSTRUCTIONS PROVIDE NECESSARY INSTRUMENTS, GAUGES AND TESTING EQUIPMENT REQUIRED.

CONTROLS, TO OBTAIN DESIGN REQUIREMENTS AND MANUFACTURER'S RATINGS. .3 TEST AND RECORD COOLING APPARATUS ENTERING AND LEAVING AIR TEMPERATURE AND WET BULB.

.4 TEST AND RECORD VOLTAGE AND RUNNING AMPERES AND COMPARE TO MOTOR NAM AND STARTER HEATER RATING AGAINST DESIGN REQUIREMENTS. .5 ENSURE THAT REFRIGERANT TEMPERATURES ARE ACCURATE TO WITHIN 0.5°C [0.9°F]

REQUIREMENTS. .6 IN COOPERATION WITH CONTROLS CONTRACTOR'S REPRESENTATIVE, SET AND ADJUS

CONTROL SYSTEM TO ACHIEVE REQUIRED SEQUENCE OF OPERATIONS. .7 BRING EQUIPMENT INTO OPERATION, TRIAL RUN AND MAKE UP ANY LOSS OF OIL AND

- .8 TEST REPORTS TO BE SUBMITTED FOR REVIEW AND INCLUSION IN MAINTENANCE MAN .10 MANUFACTURER'S FIELD SERVICES:
 - 1 HAVE MANUFACTURER OF CT-1,H REVIEW WORK INVOLVED IN T INSTALLATION/APPLICATION, PROTECTION AND CLEANING, OF ITS PRODUCT WRITTEN REPORTS, IN ACCEPTABLE FORMAT, TO VERIFY COMPLIANCE O
 - CONTRACT .2 PROVIDE MANUFACTURER'S FIELD SERVICES CONSISTING OF PRODUCT USE

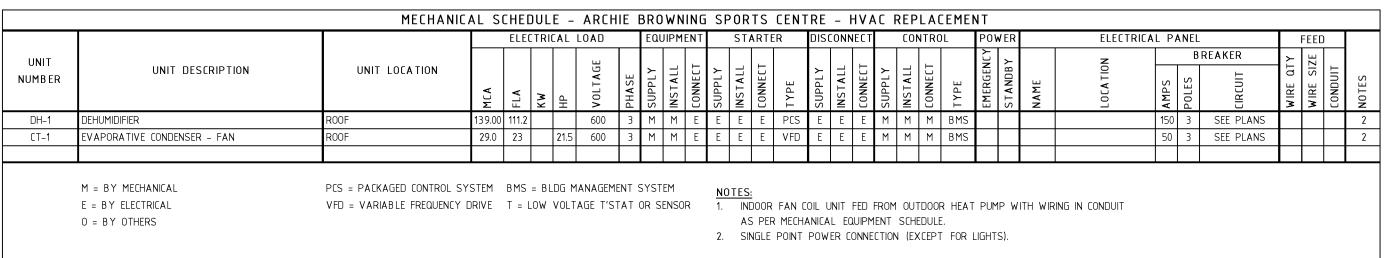
RECOMMENDATIONS AND PERIODIC SITE VISITS FOR INSPECTION OF PRODUCT INSTALLATI ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. .3 SCHEDULE SITE VISITS, TO REVIEW WORK, AT STAGES LISTED:

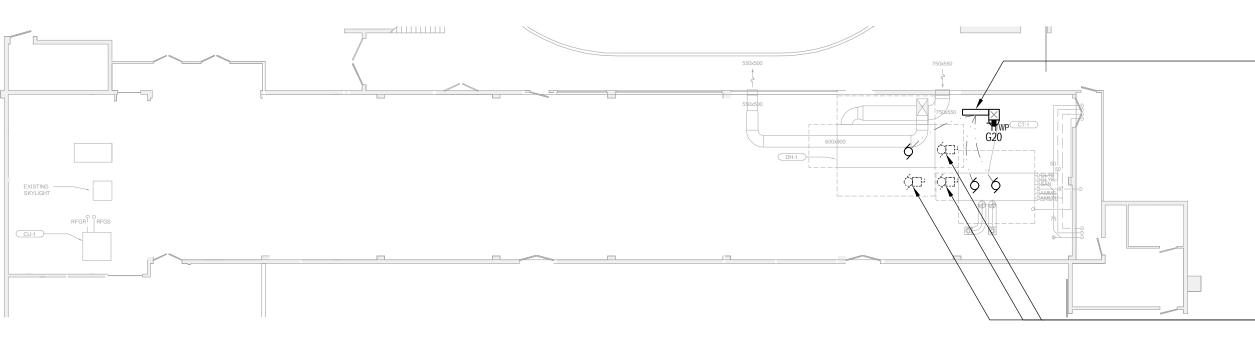
- .1 AFTER DELIVERY AND STORAGE OF PRODUCTS, AND WHEN PREPARATO OTHER WORK, ON WHICH THE WORK OF THIS SECTION DEPENDS, IS **BEFORE INSTALLATION BEGINS.**
- .2 [TWICE] DURING PROGRESS OF WORK AT [25%] AND [60%] COMPLETE.

.3 UPON COMPLETION OF THE WORK, AFTER CLEANING IS CARRIED OUT. .4 OBTAIN REPORTS, WITHIN [3] DAYS OF REVIEW, AND SUBMIT, IMM CONSULTANT.

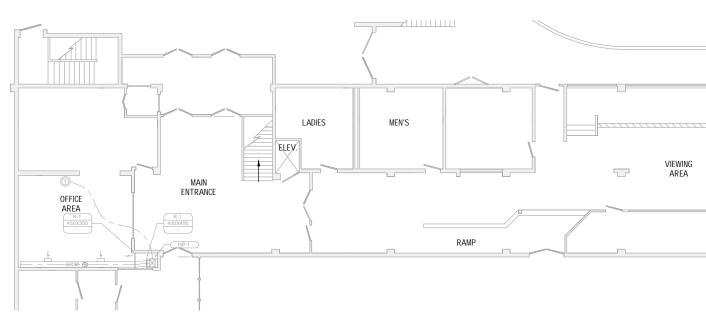
PROVIDE STEM EXTENSIONS ON ALL INSULATED VALVES.

| | 3.15 DEMONSTRATION | 72 Vie | 1 Johnso ctoria BC 250-382- | on St C, V8W | 0.040 | |
|---|--|---|-----------------------------------|-----------------|-------------------------------|--|
| ORK FROM | .1 INSTRUCTIONS: .1 POST INSTRUCTIONS IN FRAME WITH GLASS COVER IN ACCORDANCE WITH CSA B52. | | | | | |
| ES LISTED IN PPLICATIONS. EED NOT | 3.16 CLEANING .1 PROGRESS CLEANING: CLEAN IN ACCORDANCE WITH SECTION 01 74 11 - CLEANING. .1 LEAVE WORK AREA CLEAN AT END OF EACH DAY. .2 FINAL CLEANING: UPON COMPLETION REMOVE SURPLUS MATERIALS, RUBBISH, TOOLS AND EQUIPMENT. | COPYRIGHT RESERVED This drawing and design is the property of the designer to be used only for the project named below. This page or any portion thereof shall only be reproduced with express written permission. THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE CONSULTANT PRIOR TO COMMENCING THE WORK. THESE DRAWINGS ARE NOT TO BE SCALED. | | | | |
| CSA STANDARD 3 ARTICLE | DIVISION 25 INTEGRATED AUTOMATION | THESE REV. | DRAWINGS ARE P | DESCRIP | | |
| | 1. GENERAL | 1. | 2023.02.07 | ISSUED F | FOR COORDINATION | |
| | 1.1 SECTION SCOPE PROVIDE A COMPLETE SYSTEM OF AUTOMATIC CONTROLS TO MATCH THE BASE BUILDING STANDARD | <u>2.</u> <u>3.</u> | 2023.03.21 2023.10.04 | | FOR CLIENT REVIEW | |
| | WITH REGARD TO CONTROL DEVICES, COMPONENTS, WIRING AND MATERIALS. ALL CONTROL WORK ASSOCIATED WITH THE WORK OF DIVISIONS 22 AND 23. | 4. | 2023.10.20 | ISSUED F | FOR CLIENT REVIEW | |
| O THE | 1.2 RELATED REQUIREMENTS THIS SECTION OF THE SPECIFICATION FORMS PART OF THE CONTRACT DOCUMENTS AND IS TO BE READ, INTERPRETED AND COORDINATED WITH ALL OTHER PARTS. FOR GENERAL CONDITIONS REFER TO HEATING, VENTILATION AND AIR CONDITIONING (HVAC) SECTION. | | 2023.11.24 | | FOR TENDER | |
| | 1.3 CODE COMPLIANCE | | | | | |
| JSLY INSTALLED BERANT PIPING | ALL WORK SHALL COMPLY WITH CURRENT EDITIONS OF THE NATIONAL, PROVINCIAL AND MUNICIPAL CODES, STANDARDS, ACTS AND BYLAWS AND WILL MEET THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION. | | | | | |
| | 1.4 ACCEPTABLE CONTRACTORS | | | | | |
| ERY. N REMEDIED | ALL CONTROLS WORK IS TO BE DONE BY THE BASE BUILDING CONTRACTOR(ISLAND TEMPERATURE CONTROL). | | | | | |
| | 1.5 EXAMINATION OF EXISTING SYSTEM THIS PROJECT INVOLVES RENOVATION TO AN EXISTING CONTROL SYSTEM. THE CONTRACTOR SHALL | | | | | |
| IDATIONS OR STORAGE AND | THIS PROJECT INVOLVES RENOVATION TO AN EXISTING CONTROL SYSTEM. THE CONTRACTOR SHALL INSPECT THE SYSTEM PRIOR TO TENDER CLOSE AND INCLUDE IN HIS BID ALL CONTROL COMPONENTS REQUIRED TO PROVIDE A FULLY OPERATIONAL SYSTEM INCLUDING REPLACEMENT OF EXISTING DEFECTIVE COMPONENTS WHERE NOTED IN THE PROJECT DOCUMENTS. | | | | | |
| 05 15 - COMMON | 1.6 DESIGN REQUIREMENTS DESIGN AND PROVIDE CONDUIT AND WIRING LINKING ELEMENTS OF SYSTEM TO THE EXISTING BUILDING | | | | | |
| | ENERGY MONITORING AND CONTROL SYSTEM EMCS. SUPPLY SUFFICIENT PROGRAMMABLE CONTROLLERS OF TYPES TO MEET PROJECT REQUIREMENTS. | | | | | |
| SS OF GED. | QUANTITY AND POINTS CONTENTS AS REVIEWED BY CONSULTANT PRIOR TO INSTALLATION. PROVIDE UTILITY POWER TO EMCS AS INDICATED. | | | | | |
| WALLS AND SION. | 2. PRODUCTS 2.1 CONTROL COMPONENTS | | | | | |
| RTED | PROVIDE CONTROL VALVES AND DAMPER ACTUATORS AS REQUIRED TO MEET THE SEQUENCE OF OPERATION AND MEET THE DESIGN INTENT. VALVES AND ACTUATORS SHALL MATCH THE BASE BUILDING STANDARD UNLESS NOTED OTHERWISE. CONTROL VALVES FOR NEW MECHANICAL EQUIPMENT SHALL BE PROVIDED BY CONTROLS CONTRACTOR | | | | | |
| IL RETURN TO | FOR INSTALLATION BY THE MECHANICAL CONTRACTOR. WHERE EXISTING DEVICES ARE RE-USED, VERIFY OPERATION AND RE-CALIBRATE AS REQUIRED. VERIFY CORRECT OPERATION OF CONTROLLED DEVICES INCLUDING EXISTING CONTROL VALVES, ETC. | | | | | |
| OT TO DISTURB | WITHIN THE AREA OF RENOVATION. CONTROL VALVES AND ACTUATORS TO BE COMPATIBLE WITH BASE BUILDING STANDARD UNLESS NOTED | | | | | |
| CONSTRUCT | OTHERWISE. NEW CONTROL VALVE OPERATION TO BE COMPATIBLE WITH EXISTING. REPORT ANY EXISTING CONTROL DEVICE WHICH NEED REPLACEMENT. REPLACEMENT WILL BE BY BUILDING MANAGEMENT OR VIA CHANGE ORDER, AT THE DISCRETION OF THE OWNER. | | | | | |
| OR EXPANSION | BUILDING MANAGEMENT OR VIA CHANGE ORDER, AT THE DISCRETION OF THE OWNER. | | | | | |
| PIPING MUST BE MUST ALSO BE | 3.1 DH-1 SEQUENCE OF OPERATION | | | | | |
| AS REQUIRED. | .1 SYSTEM STARTUP .1 POWER IS TURNED ON OR THE SYSTEM IS RESTARTED | | | | | |
| | .2 AFTER A SHORT INITIAL DELAY TO ALLOW THE SENSORS TO STABILIZE, THE BLOWER STARTS AND OPERATES CONTINUOUSLY. .3 BASED ON SENSOR FEEDBACK, THE SYSTEM SHALL BEGIN OR RESUME OPERATION BASED ON THE | | | | | |
| V SIDES H AND LOW | .2 AIRSIDE CONFIGURATION | | _ | Y | -A | |
| /ITH | .1 THE SYSTEM CONTINUOUSLY DELIVERS THE SPECIFIED SUPPLY AIR AND EXHAUST AIR VOLUME TO THE ARENA. | | _ | | や | |
| | .2 .3 DEHUMIDIFICATION MODE | | | | | |
| RS BEFORE AND | .1 WHEN THE ARENA ABSOLUTE HUMIDITY IS ABOVE THE HUMIDITY SETPOINT, ACTIVATE DH-1. ABSOLUTE HUMIDITY SETPOINT TO BE 50% (OPERATOR ADJUSTABLE). | CON | ISULTANT: | | | |
| | .2 THE DESICCANT WHEEL MOTOR, PROCESS FAN AND REGENERATION FAN ACTIVATE. .3 THE ELECTRIC REHEAT COILS ARE FULLY MODULATING (0-100%). THE ELECTRIC REHEAT OUTPUT WILL MODULATE TO MAINTAIN THE DISCHARGE TEMPERATURE AT SET POINT YEAR-ROUND. DISCHARGE | | | | | |
| LLING 5 PA | TEMPERATURE TO BE SET TO 60F (OPERATOR ADJUSTABLE). | | | | | |
| BETWEEN | 3.2 CT-1 SEQUENCE OF OPERATION .1 CT-01 SEQUENCE OF OPERATIONS TO MATCH EXISTING EXCEPT FOR THE FOLLOWING CHANGE. | | | | | |
| СТ | .1 AT 50F OUTDOOR DRYBULB CONDITIONS (OPERATOR ADJUSTABLE), DISABLE WATER SPRAY. .2 IF RETURN TEMPERATURE ON AMMONIA CONDENSER LOOP CLIMBS MORE THAN 5F (OPERATOR | | | | | |
| | ADJUSTABLE) ABOVE SETPOINT AND OUTDOOR AIR TEMPERATURE IS ABOVE FREEZING, ENABLE WATER SPRAY. | | | | | |
| IZATION OF | | | | | | |
| TH NEW (NOT EPLACED. IF A TION SHALL BE | | SEAL | | | | |
| TION SHALL BE PPED SHALL BE | | | Ot fc | CR | | |
| IDE. LOW SIDE | | | | | CTION | |
| ATION OF | | | | | | |
| CHARGING | | | | | | |
| GING PROCESS. | | | | | | |
| PERATION AND | | | | י ח | | |
| ADJUST | | | | | | |
| RES, DRY BULB, | | | | | ENTRE - | |
| MEPLATE DATA, | | H | VAC | Rep | LACEMENT | |
|) OF DESIGN | | | | | | |
| JST AUTOMATIC | | | JECT ADDRE | | | |
| NUALS. HE HANDLING, | | | 53 Esquim | alt Roa | d, Victoria, BC | |
| S] AND SUBMIT DF WORK WITH | | | WN BY CKED BY | | JL CJB | |
| ION IN | | SCAL DATE | | | AS NOTED November 24, 2023 | |
| ORY WORK, OR COMPLETE BUT | | DRAV | WING TITLE: | | | |
| MEDIATELY, TO | | | | | | |
| | | PROJ | JECT NO. | | DRAWING NO. | |
| | | 00 | 0a-130 | 3-22 | M3.02 | |









ELECTRICAL SPECIFICATION

- 26 05 00 COMMON WORK RESULTS FOR ELECTRICAL CONTRACT
- 1. The TERM "PROVIDE" MEANS SUPPLY AND INSTALLATION OF REFERENCED ITEM, WORK AND/OR SYSTEM INCLUDING ALL LABOUR, MATERIALS, EQUIPMENT, SERVICES, COORDINATION WITH OTHERS, PROGRAMMING VERIFICATION, COMMISSIONING, WARRANTY AND OTHER MANUFACTURER CODES STANDARDS AND CONTRACT DOCUMENTS REQUIRED ELEMENTS FOR A COMPLETE AND OPERATIONAL SYSTEM.
- 2. PROVIDE ALL SYSTEMS AS OUTLINED IN THE Specifications and indicated in the DRAWINGS, UNLESS SPECIFICALLY NOTED THAT THE MATERIAL/EQUIPMENT, LABOUR OR OTHER SERVICES ARE NOT IN SCOPE.
- 3. THE REQUIREMENTS OF THIS SPECIFICATIONS ARE IN ADDITION TO THOSE SPECIFIED WITHIN THE GENERAL CONDITIONS AND OTHER SECTIONS OF THE CONTRACT DOCUMENTS. WHERE THE SPECIFICATIONS AND DRAWINGS CONTRADICT EACH OTHER, REQUEST CLARIFICATION PRIOR TO PRICING, AND WHEN CLARIFICATION IS NOT FORMALLY COMMUNICATED IN AN ADDENDUM TO ALL BIDDERS, ALLOW FOR THE MOST EXPENSIVE OPTION.

CODES AND PERMITS

- 4. Obtain and pay for all permits and LICENSES.
- 5. PROVIDE INSTALLATION AS PER THE CURRENT EDITION OF THE CANADIAN ELECTRICAL CODE. CURRENT EDITION OF THE BC BUILDING CODE, Relevant municipality bylaws and the ELECTRICAL INSPECTION AUTHORITY.
- Equipment and materials
- 6. All supplied materials shall be in New CONDITION AND MUST BEAR A CERTIFICATION MARK INDICATING THAT THE PRODUCT WAS TESTED AND HAS MET THE CERTIFICATION REQUIREMENTS FOR USE IN CANADA. IF Required, obtain and pay for field CERTIFICATION OF EQUIPMENT. WARRANTY
- 7. PROVIDE WARRANTY FOR ALL INSTALLATION TO BE PROTECTED AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF NOT LESS THAN 1 YEAR AFTER FINAL APPROVAL. ELECTRICAL CONTRACTOR MUST COVER ALL COSTS OF REPAIR AND REPLACEMENT OF DEFECTIVE MATERIALS AND WORKMANSHIP INCLUDING BUT NOT LIMITED TO PARTS, LABOR, TRAVEL EXPENSES, EXPENDABLE MATERIALS

AND OTHER ITEMS REQUIRED FOR A REPAIR. 8. PROVIDE STANDARD MANUFACTURER'S

WARRANTY FOR ALL EQUIPMENT PROVIDED. SUBSTITUTIONS OR ALTERNATES

- 9. WHERE THE TERM "OR APPROVED EQUIVALENT" IS USED, ALTERNATES REQUIRE ACCEPTANCE BY ENGINEER PRIOR TO PRICING/TENDER COMPLETION.
- 10.THE TERM "OR EQUIVALENT" MEANS A PRODUCT, MATERIAL OR EQUIPMENT OF EQUAL OR HIGHER QUALITY; AND ALTERNATES DO NOT REQUIRE ACCEPTANCE BY ENGINEER PRIOR TO PRICING/TENDER COMPLETION.
- 11. WHERE OTHER SUBSTITUTIONS ARE DESIRED, REQUEST APPROVAL OF SUBSTITUTIONS AND RECEIVE WRITTEN APPROVAL OF ACCEPTANCE FROM E2 ENGINEERING PRIOR TO PROCEEDING. REQUEST FOR APPROVAL MUST BE SPECIFIC, ACCOMPANIED WITH APPLICABLE SPECIFICATION SHEETS IN PDF FORMAT, AND NO LESS THAN FIVE DAYS PRIOR TO TENDER STAGE COMPLETION DATE.
- 12.THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THE ACCEPTABILITY OF PHYSICAL DIMENSIONS AND CRITERIA(S) DESCRIBED WITHIN THE CONTRACT DOCUMENTS FOR THE PRODUCT MATERIAL OR EQUIPMENT BEING SUBSTITUTED. IN THE EVENT THAT THE PHYSICAL DIMENSIONS AND/OR CRITERIA(S) DESCRIBED WITHIN THE CONTRACT DOCUMENTS IS FOUND UNACCEPTABLE DURING CONSTRUCTION, IT IS THE CONTRACTORS RESPONSIBILITY TO RECTIFY THE CONDITION AT THE CONTRACTOR'S COST.
- TENDER COORDINATION 13.SEE ARCHITECTURAL SPECIFICATION FOR REFERENCE TO GENERAL GUIDELINES.
- 14. REVIEW ARCHITECTURAL, MECHANICAL, STRUCTURAL AND INTERIOR DESIGNER DRAWINGS AND SPECIFICATIONS TO CONFIRM THE SCOPE OF WORK AND IMPACT ON ELECTRICAL WORKS. INCLUDE REASONABLE COST IN THE TENDER SUM FOR COMPLICATIONS AND Additional work described therin. 15.INCLUDE ALL COSTS IN THE TENDER SUM
- REQUIRED TO: a. PROVIDE ALL ELECTRICAL WORKS TO MAKE MECHANICAL SYSTEMS AND ASSOCIATED LINE VOLTAGE CONTROLS COMPLETE AND OPERATIONAL.
- b. PROVIDE ALTERNATE ROUTES OF CONDUITS AND CABLES TO AVOID MECHANICAL SYSTEMS, ARCHITECTURAL AND STRUCTURAL RESTRICTIONS/LIMITATIONS.
- c. FIRESTOP AND SMOKE SEAL REQUIREMENTS BASED ON ARCHITECTURAL DRAWINGS AND

2 LOWER FLOOR ELECTRICAL LAYOUT

SPECIFICATIONS.

- CONSTRUCTION COORDINATION 16.PROVIDE SCANNING PRIOR TO TRENCHING, SAW CUTTING, AND CORING/DRILLING. CONFIRM ACCEPTANCE OF LOCATION WITH STRUCTURAL ENGINEER TO ENSURE STRUCTURAL INTEGRITY OF THE STRUCTURE.
- 17.ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE AND DO NOT INDICATE ALL REQUIRED COMPONENTS TO MAKE THE SYSTEM COMPLETE AND OPERATIONAL. UPDATE AS-BUILT DRAWINGS TO INDICATE ACTUAL INSTALL.
- 18.UPON DIRECTION FROM ENGINEER OR ARCHITECT, MOVE ELECTRICAL DEVICE (PRIOR TO WIRING) WITHIN 10 FEET FROM LOCATION SHOWN ON DRAWINGS AT NO ADDITIONAL COST.
- 19.CONTACT ENGINEER, OWNER FORCES, INTERIOR DESIGNER AND ARCHITECT PRIOR TO WIRING FOR A SITE WALKTHROUGH TO CONFIRM ACCEPTANCE OF ELECTRICAL DEVICE HEIGHT AND LOCATIONS, IF REOUIRED.
- 20. COORDINATE WITH MILLWORK DRAWINGS TO ENSURE THAT DEVICE LOCATIONS, MOUNTING HEIGHTS, DEVICE OFFSET FROM STUDS, AND OTHER ELECTRICAL SYSTEMS (SUCH AS CABLE ROUTING) DO NOT CONFLICT WITH INTENT OF MILLWORK DRAWINGS. PROVIDE ADJUSTMENT AT NO ADDITIONAL COST WHERE SUCH INTENT IS NOT MET.
- 21.LOCATE LIGHT SWITCHES ON LATCH SIDE OF DOORS.
- Shop drawings 22. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING ITEMS:
- a. SPLITTER & DISCONNECT SWITCH b. FIRESTOPS
- PROJECT RECORD DRAWINGS
- 23. PROVIDE ONE SET OF FULL SIZE ELECTRICAL DRAWINGS ON SITE RECORD SITE CHANGES, SITE INSTRUCTIONS, CHANGE ORDERS, ANY OTHER ALTERNATIONS, CONDUIT ROUTING, FIRE ALARM DEVICE ADDRESSES AND DATA OUTLET ADDRESSES ON THE DRAWINGS. HAND OVER DIGITAL RECORD DRAWINGS TO ENGINEER AND HARDCOPY TO OWNER FORCES.
- 24. PROVIDE RECORD DRAWINGS IN AUTOCAD 2021 AND PDF FORMAT WITH ALL THE CHANGES INCORPORATED. HAND OVER RECORD DRAWINGS TO ENGINEER FOR FINAL REVIEW.
- 25. THE ELECTRICAL CONTRACTOR MAY CHOOSE TO HIRE THE ENGINEER TO CONVERT CONTRACTOR MARKUPS OF RECORD DRAWINGS

- EXISTING 200A-480V, 3PH "KLOCKNER + MOELLER" MCC 'B' - Existing panel 'g' ADD 15A-1P BREAKER TO FEED NEW COMPRESSOR ROOM WEATHERPROOF RECEPTACLE ON ROOF - EXISTING 1200A-347/600V MAIN DISTRIBUTION (FPE) FIRST - EXISTING 112.5kVA 600V~480V, 3PH, 4W TRANSFORMER - EXISTING FLOOR MOUNTED 300.0kVA 600V~120/208V, 3PH, 4W TRANSFORMER ROOM NEW 400A-347/600V, 3PH, 4W SPLITTER & 200A FUSED DISCONNECT SWITCH

TO AUTOCAD 2021 AND PDF FORMAT AT A COST OF \$300 PER SHEET.

- MECHANICAL SYSTEM COORDINATION 26. ELECTRICAL DRAWINGS DO NOT SHOW ALL MECHANICAL EQUIPMENT CONTROLS. REFER TO MECHANICAL EQUIPMENT SCHEDULE AND PROVIDE CONTROLS EQUIPMENT, WIRING AND OTHER REQUIRED COMPONENTS TO ENABLE THE MECHANICAL EQUIPMENT TO OPERATE AS DESCRIBED IN THE MECHANICAL EQUIPMENT SCHEDULE.
- 27. FOR MECHANICAL EQUIPMENT AND OTHER EQUIPMENT SUPPLIED AND MOUNTED BY OTHERS, PROVIDE WIRING, STARTERS, CONNECTIONS, CONTROLS, WIRING AND DISCONNECTS FOR A COMPLETE AND OPERATIONAL SYSTEM.
- 28. ALL LOW VOLTAGE CONTROL WIRING BY OTHERS. ALL LINE VOLTAGE CONTROL WIRING BY ELECTRICAL CONTRACTOR.
- 29. WIRE AND CONNECT LINE VOLTAGE CONTROLS SUPPLIED BY OTHERS FOR MECHANICAL EQUIPMENT. COORDINATE LOCATION OF LINE VOLTAGE CONTROLS SUPPLIED BY OTHERS AS SUCH EQUIPMENT ARE NOT SHOWN ON PLANS.
- 30. WHERE LINE VOLTAGE IS REQUIRED FOR EQUIPMENT SUPPLIED BY CONTROLS CONTRACTOR, PROVIDE WIRING, CONDUIT, TRANSFORMER AND OTHER EQUIPMENT OR LABOR REQUIRED TO ENABLE LOW VOLTAGE CONTROLS CONTRACTOR TO COMPLETE WORK FOR A COMPLETE AND OPERATIONAL SYSTEM.
- 31.COORDINATE AND CONFIRM ELECTRIC CHARACTERISTICS (VOLTAGE, PHASE, AMPERAGE, HORSEPOWER) AND CONTROLS FOR ALL MECHANICAL SYSTEMS WITH MECHANICAL DRAWINGS, SPECIFICATIONS AND MECHANICAL TRADE ON SITE.
- LABELLING
- 32. LABEL EACH RECEPTACLE WITH P-TOUCH LABEL TO DESIGNATE PANEL AND CIRCUIT INFORMATION. FOR EXAMPLE, "XX-YY" WHERE 'XX' INDICATED PANEL DESIGNATION AND 'YY INDICATED CIRCUIT INFORMATION. LABELLING WITHIN SUITES IS NOT REQUIRED.
- 33. LABEL EACH COMMUNICATION OUTLET WITH P-TOUCH LABEL TO DESIGNATE LOCATION OF TERMINATION IN SERVER RACK.

26 05 07 - FIRESTOPPING AND SMOKE SEAL SYSTEMS

34. PROVIDE ULC OR CUL LISTED FIRESTOP FOR ALL PENETRATIONS IN FIRE RATED ASSEMBLIES IN ACCORDANCE WITH BRITISH COLUMBIA BUILDING CODE 2018, LATEST CODES, STANDARDS AND REQUIREMENTS OF THE AUTHORITIES HOLDING JURISDICTION.

- 35. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF FIRE SEPARATIONS (WALLS WITH FIRE RESISTANCE RATING).
- 36. PROVIDE AND INSTALL FIRE RATED PUTTY PAD FOR ALL NON-COMBUSTIBLE (METALLIC) OUTLET BOXES SEPARATED BY LESS THAN 600mm IN WALLS WITH A FIRE RESISTANCE RATING.

37. PROVIDE FIRESTOP ASSEMBLY TO SEAL ALL ELECTRICAL PENETRATIONS. FIRESTOP ASSEMBLY MUST SUFFICIENTLY PROVIDE THE FIRE (F) AND TEMPERATURE (T) RATING TO MATCH THE F AND T RATING OF FIRE SEPARATIONS BETWEEN PARKING AREA AND

- FLOOR ABOVE. 26 05 15 - SEISMIC CONTROL AND RESTRAINT 1. PROVIDE SEISMIC RESTRAINTS IN ACCORDANCE WITH THE LATEST BRITISH COLUMBIA BUILDING
- CODE, CODES, STANDARDS, AND REQUIREMENTS OF THE AUTHORITIES HOLDING JURISDICTION. 2. HIRE SERVICES OF A REGISTERED PROFESSIONAL
- IN THE FIELD OF SEISMIC DESIGN TO PROVIDE THE FOLLOWING: a. INSTALLATION DETAILS FOR SUPPORT AND
- BRACING OF: i. Suspended Luminaires
- b. A DIGITAL COPY OF ALL THE SITE REVIEWS PERFORMED BY THE REGISTERED PROFESSIONAL WITH A LETTER STATING COMPLIANCE
- c. SUBMIT SIGNED AND SEALED SCHEDULE 'S' LETTERS OF ASSURANCE
- 26 15 20 WIRES AND CABLES 1. PROVIDE AC90 OR WIRING IN CONDUIT IN ALL

SPACES.

AREAS. NMD90 NOT ACCEPTABLE. 2. TECK90 AND ACWU NOT ACCEPTABLE IN PLENUM SPACES UNLESS WRITTEN PERMISSION FROM MANUFACTURER IS PROVIDED THAT CONFIRMS THE FT4 RATED OUTER JACKET ON THEIR CABLE CAN BE REMOVED ON SITE WITHOUT LOSS IN WARRANTY AND CERTIFICATION FOR USE IN CANADA. ALTERNATIVELY, PROVIDE CONDUCTORS IN EMT CONDUIT IN PLENUM

3. SUBSTITUTION OF ALUMINUM CONDUCTORS IN LIEU OF COPPER CONDUCTORS FOR NORMAL AND STANDBY (NON-EMERGENCY) DISTRIBUTION IS ACCEPTABLE WHERE COPPER FEEDERS ARE RATED MORE THAN 100A PROVIDED THE SUBSTITUTED CONDUCTORS HAVE AN AMPACITY EQUIVALENT OR LARGER THAN THE SPECIFIED COPPER CONDUCTOR HAVE AN AMPACITY EQUIVALENT OR LARGER THAN THE SPECIFIED COPPER CONDUCTOR AMPACITY HAS A VOLTAGE DROP LESS THAN 2% BETWEEN THE Source Panel and Panelboard Being Fed, AND THE CONDUIT SIZES ARE INCREASED TO MAINTAIN EQUIVALENT CONDUIT FILL AT NO ADDITIONAL COST.

26 15 25 - GROUNDING AND BONDING

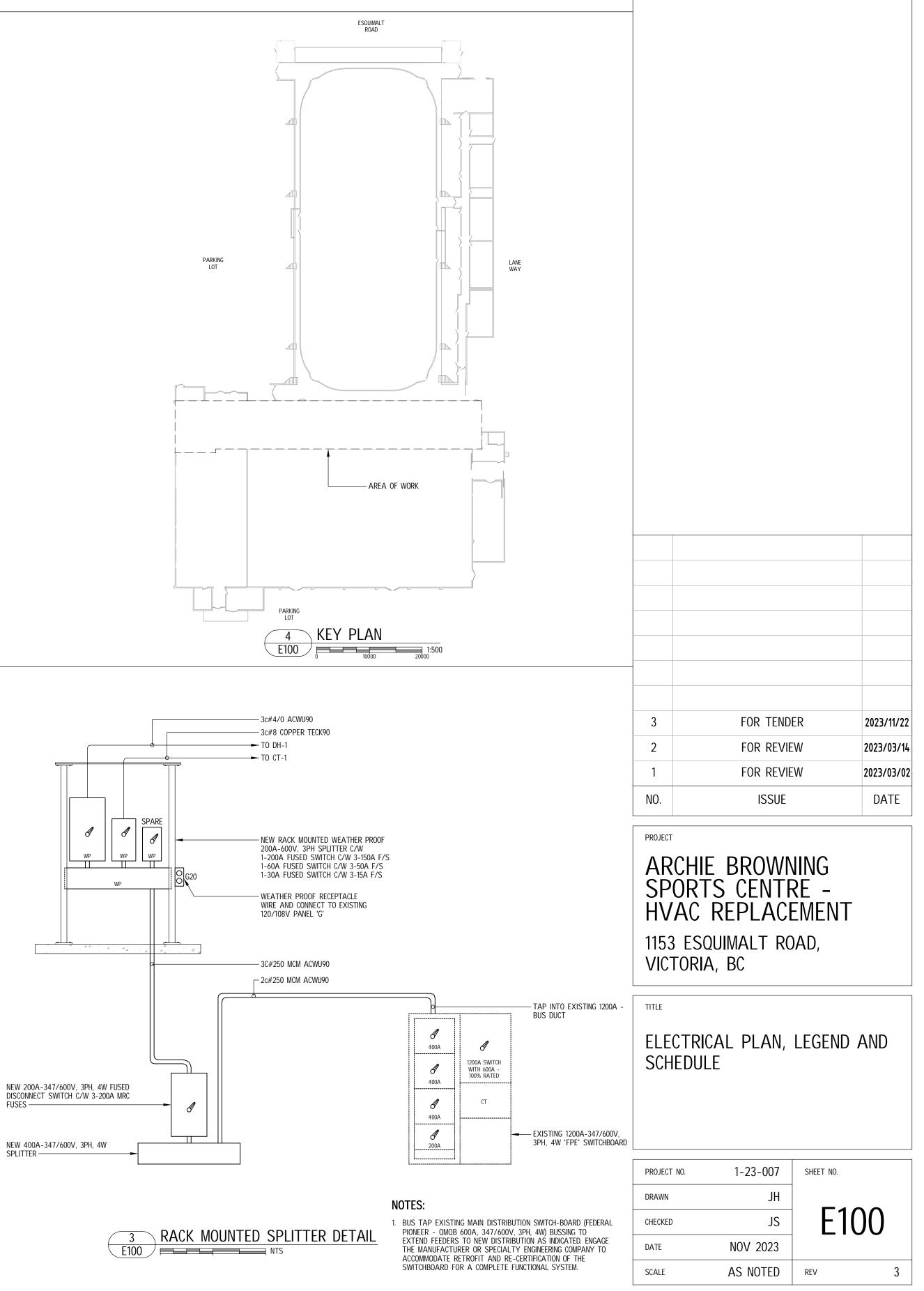
- FXISTING 400A-600V. 3PH

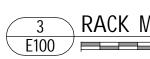
"KLOCKNER + MOELLER" MCC 'A'

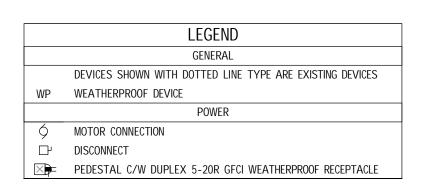
- NEW RACK MOUNTED 200A-600V, 3PH WP SPLITTER C/W FUSED DISCONNECT SWITCHES

DISCONNECT EXISTING HRV, COOLING TOWER & DEHUMIDIFIER, REMOVE ALL EXISTING ASSOCIATED WIRING

- 1. PERFORM ALL REQUIRED SECONDARY ELECTRICAL WORK GROUNDING AND BONDING WORK IN ACCORDANCE WITH THE REQUIREMENTS OF GOVERNING CODES AND STANDARDS, INCLUDING THE ELECTRICAL SAFETY AUTHORITY.
- 2. BOND METALLIC CONDUITS, BOXES, CABLE TRAY, DUCTS, AND NON-CURRENT CARRYING METAL PARTS OF EQUIPMENT TOGETHER TO FORM A CONTINUOUS GROUND SYSTEM. IN ELECTRICAL EQUIPMENT ROOMS, SOLIDLY BOND CIRCUITS, PANELBOARDS, CONDUITS, EQUIPMENT ENCLOSURES, AND OTHER EQUIPMENT TO PERIMETER GROUND BUS USING BRONZE CONNECTORS AND HARDWARE.







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