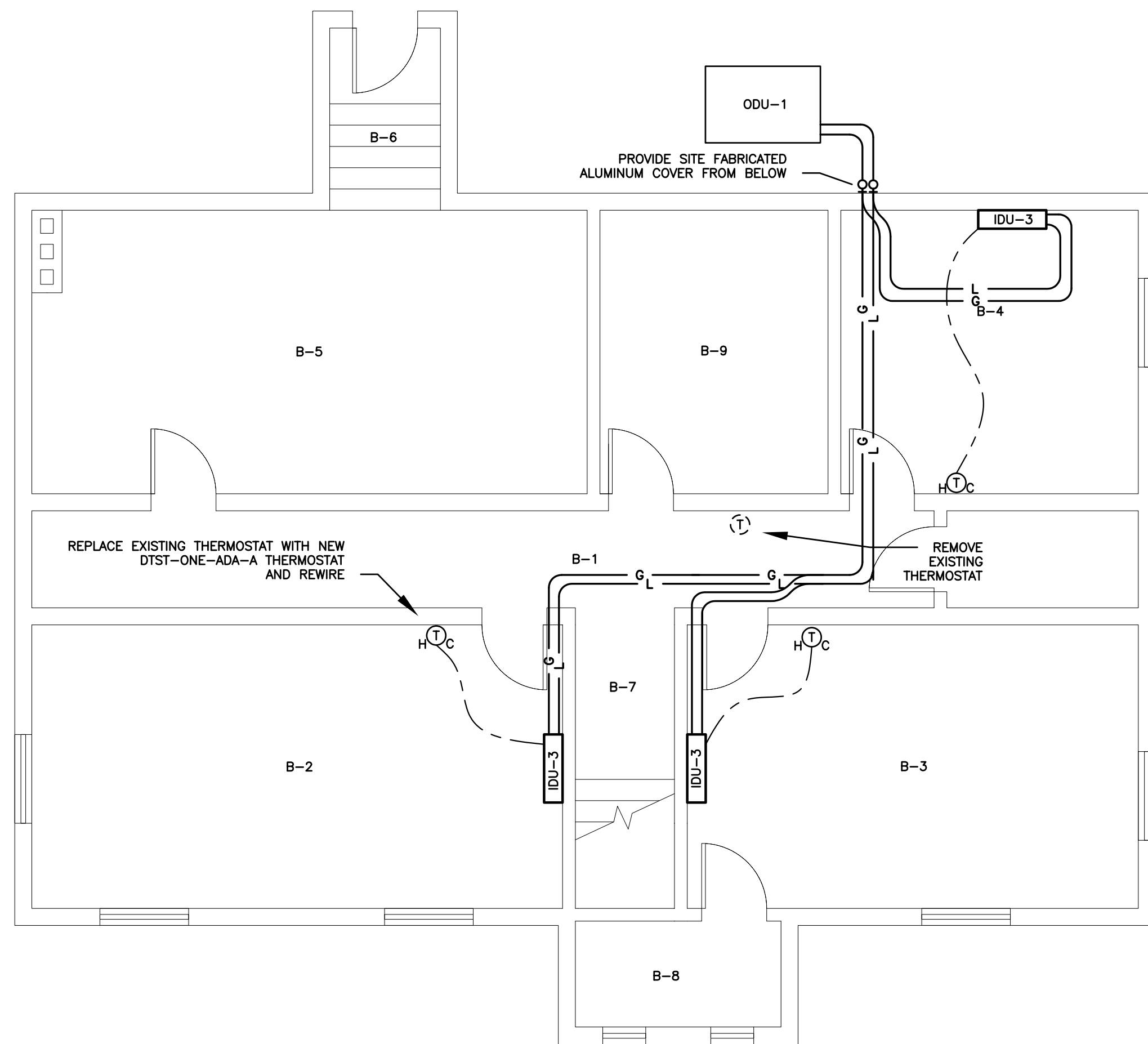
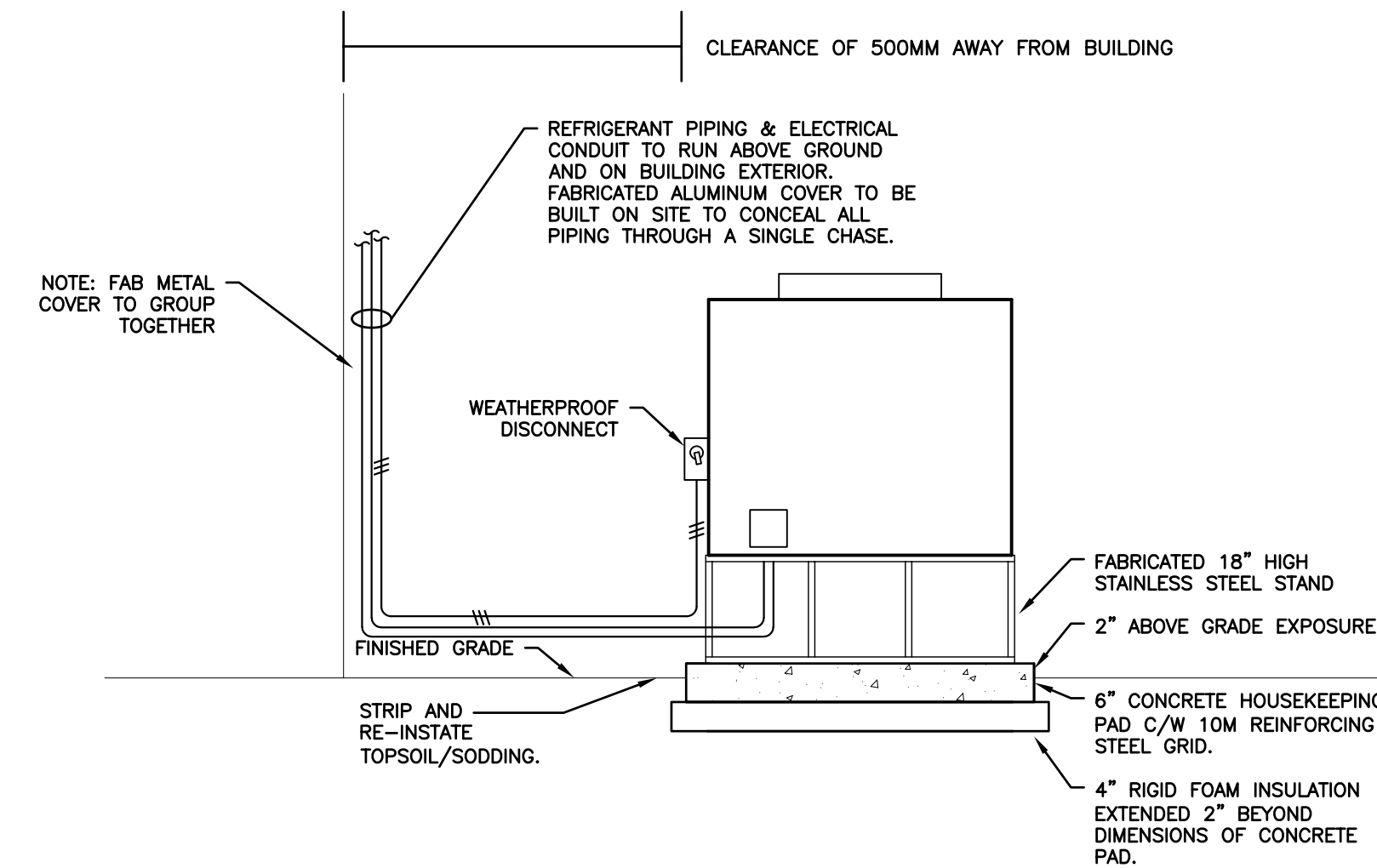


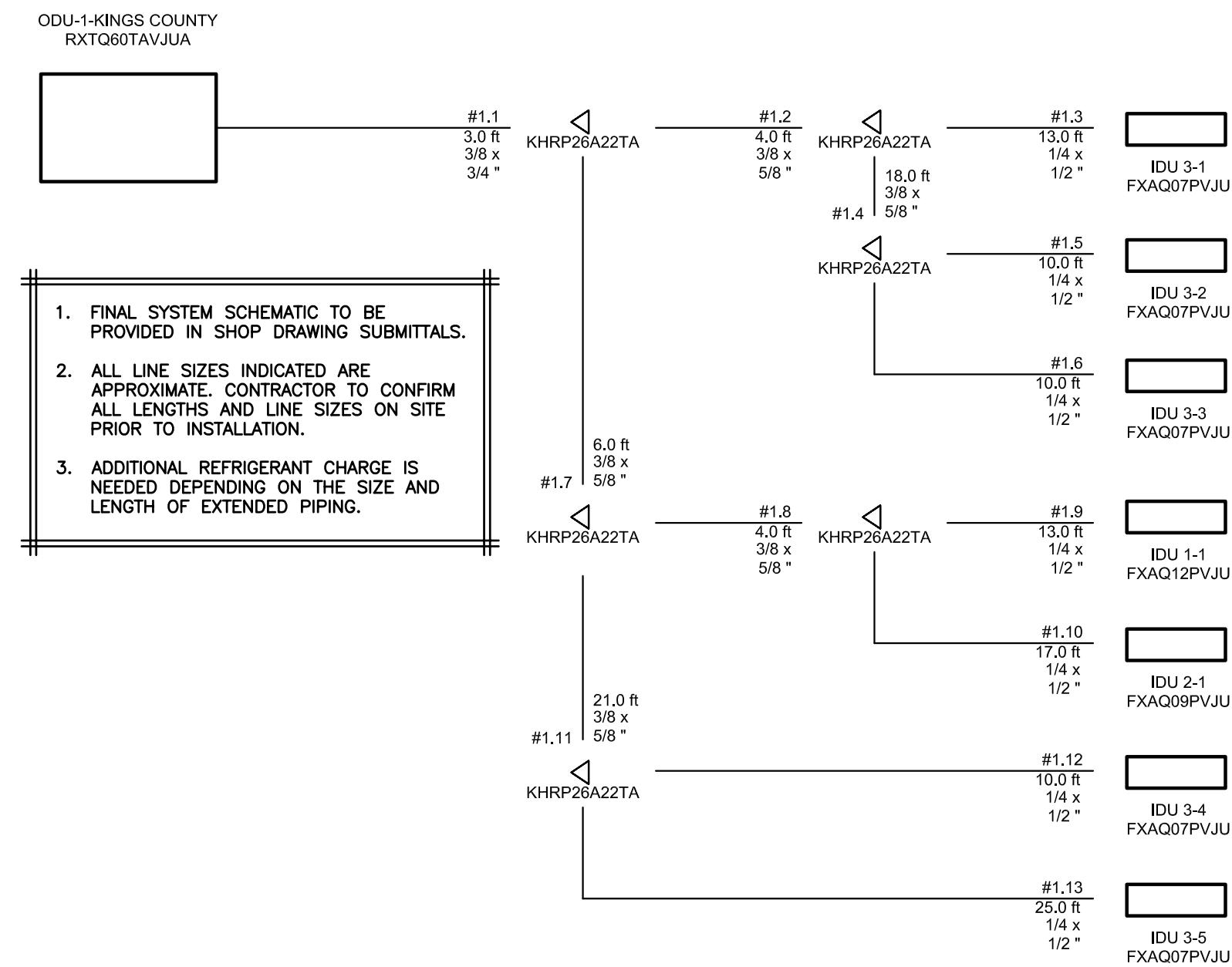
**1 FIRST FLOOR**  
SCALE: 1:50



**2 BASEMENT FLOOR**  
SCALE: 1:50



**3 OUTDOOR UNIT SCHEMATIC**  
SCALE: NOT TO SCALE



**4 VRY SYSTEM SCHEMATIC**  
SCALE: NOT TO SCALE

1. FINAL SYSTEM SCHEMATIC TO BE PROVIDED IN SHOP DRAWING SUBMITTALS.
2. ALL LINE SIZES INDICATED ARE APPROXIMATE. CONTRACTOR TO CONFIRM ALL LENGTHS AND LINE SIZES ON SITE PRIOR TO INSTALLATION.
3. ADDITIONAL REFRIGERANT CHARGE IS NEEDED DEPENDING ON THE SIZE AND LENGTH OF EXTENDED PIPING.

TAG	MAKE	MODEL	SERVING AREA	NOMINAL COOLING CAPACITY (MBH)	NOMINAL HEATING CAPACITY (MBH)	ELECTRICAL DATA			EER / SEER (NON-DUCTED)	COMMENTS
						MCA	MOCp	POWER SUPPLY V/PH/Hz		
ODU-1	DAIKIN	RTXQ60TAVJUA	OUTSIDE	62142	55033	29.1	35	208 / 1 / 60	9.8 / 18	SNOW HOOD, WIND RAFFLES AND VIBRATION PADS BETWEEN SNOW STAND AND CONDENSER.
IDU-1	DAIKIN	FXAQ12PVJU	ROOM 102	11342	14000	0.4	15	208 / 1 / 60	-	C/W (1) DTST-ONE-ADA-A THERMOSTAT, EC-1-DV SERIES MINI-SPLIT CONDENSATE PUMP
IDU-2	DAIKIN	FXAQ09PVJU	ROOM 101	8994	11100	0.3	15	208 / 1 / 60	-	C/W (1) BRCL1E73 THERMOSTAT, EC-1-DV SERIES MINI-SPLIT CONDENSATE PUMP
IDU-3	DAIKIN	FXAQ07PVJU	ROOM 103, 104, B2, B3, B4	7095	8700	0.3	15	208 / 1 / 60	-	C/W (1) DTST-ONE-ADA-A THERMOSTAT, (5) BRCL1E73 THERMOSTAT, EC-1-DV SERIES MINI-SPLIT CONDENSATE PUMP

**LEGEND**

- EXISTING THERMOSTAT
- NEW THERMOSTAT
- REFRIGERANT LIQUID LINE
- REFRIGERANT GAS LINE



ISSUED FOR TENDER  
2023-09-07



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TRANSPORTATION AND INFRASTRUCTURE  
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Project Title :  
**Kings County Forestry Depot**

Drawing Title :  
**HVAC - Refrigeration Piping**

Scale : AS NOTED Design By : AA  
Drawn By : LJDJ Date : SEPTEMBER, 2023  
Project No.: (23-197) Drawing No.:

2400-23070 **M-1**

- 1.0 GENERAL
- 1.1 GENERAL CONDITIONS:
- .1 ALL CONTRACT GENERAL CONDITIONS APPLY TO THIS SECTION.
- 1.2 SCOPE OF WORK:
- .1 THE WORK INCLUDED SHALL INCLUDE THE FURNISHING OF ALL LABOR, MATERIALS, EQUIPMENT, PLANT TOOLS AND SERVICES NECESSARY FOR THE INSTALLATION OF THE MECHANICAL SYSTEMS AS INDICATED.
- 1.3 SITE VISITS:
- .1 BEFORE COMMENCING WORK VISIT SITE AND VERIFY THAT REQUIREMENTS OF PLANS AND SPECIFICATIONS ARE CONSISTENT WITH SITE CONDITIONS.
- .2 ADVISE THE ENGINEER IN WRITING OF ANY DISCREPANCIES OR CONFLICTS.
- .3 NO ALLOWANCE SHALL BE MADE FOR FAILURE TO INCLUDE ITEMS WHICH A THOROUGH INVESTIGATION WOULD HAVE SHOWN TO BE REQUIRED.
- .4 BIDDERS SHOULD NOTE THAT THIS PROJECT IS A RENOVATION OF AN EXISTING BUILDING AND NO ATTEMPT HAS BEEN MADE TO SHOW ALL EXISTING CONDITIONS. EACH BIDDER IS RESPONSIBLE TO DETERMINE THE EXTENT OF THEIR WORK INVOLVED IN TYING INTO EXISTING SYSTEMS OR RE-ROUTING HIS WORK AROUND OBSTRUCTIONS.
- 1.4 THE MECHANICAL DRAWINGS ARE DIAGRAMMATIC, INTENDED TO SHOW GENERAL ARRANGEMENT AND SIZES OF SYSTEM COMPONENTS, AND SHALL NOT BE SCALED. THE ARCHITECTURAL AND STRUCTURAL DRAWINGS, AND EXISTING CONDITIONS SHALL GOVERN SPACE CONSTRAINTS, ACTUAL CONNECTION ARRANGEMENTS, DIMENSIONS AND FINISHES.
- CONTRACTOR SHALL VISIT THE PROJECT SITE, THOROUGHLY INVESTIGATE AND BE FAMILIAR WITH ALL EXISTING CONDITIONS WHICH WILL AFFECT THEIR WORK.
- THE EQUIPMENT LOCATIONS SHOWN ARE APPROXIMATE AND MUST BE SIZED AS PER SITE SPECIFIC REQUIREMENTS AND APPROVED BY OWNER.
- ALL OFFSETS AND FITTINGS WHICH WILL BE NECESSARY TO ACCOMPLISH THE FINISHED INSTALLATION SHALL BE PROVIDED AT NO ADDITIONAL COST OR INCREASE IN THE CONTRACT. ALL EQUIPMENT AND MATERIALS SHALL BE NEW UNLESS NOTED OR SPECIFIED OTHERWISE.
- PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE. PROVISIONS SHALL BE MADE TO PREVENT NOISE AND VIBRATION.
- 1.6 REFERENCE STANDARDS AND REGULATIONS:
- .1 ALL WORK SHALL BE IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND REGULATIONS IN THE EVENT OF A CONFLICT THE MORE STRINGENT REQUIREMENT SHALL BE MET.
- NATIONAL BUILDING CODE OF CANADA.
  - REGULATIONS OF PROVINCIAL DEPARTMENT OF LABOUR.
  - REGULATIONS OF PROVINCIAL DEPARTMENT OF HEALTH.
  - REGULATIONS OF PROVINCIAL DEPARTMENT OF THE ENVIRONMENT.
  - REQUIREMENTS OF PROVINCIAL FIRE MARSHALL.
  - REQUIREMENTS OF MUNICIPAL FIRE AUTHORITY.
- 1.7 PERMITS AND TESTING:
- .1 CONTRACTOR SHALL OBTAIN AND PAY FOR ANY PERMITS REQUIRED BY LOCAL CODES AND REGULATIONS AND ARRANGE FOR INSPECTIONS.
- .2 ANY ADDITIONAL MATERIALS OR LABOUR REQUIRED TO CONFORM TO ANY OF THE REGULATIONS OF REFERENCED STANDARDS SHALL BE FURNISHED UNDER THE CONTRACT WITH NO ADDITIONAL COST TO THE OWNER.
- .3 TEST SYSTEMS IN ACCORDANCE WITH THE REQUIREMENTS OF THE REFERENCED STANDARDS, REGULATIONS AND AUTHORITIES HAVING JURISDICTION (AHJ).
- 1.8 QUALIFICATIONS:
- .1 EXECUTION OF THE WORK SHALL BE BY LICENSED CONTRACTOR CERTIFIED FOR THE INSTALLATION OF SYSTEMS AND EQUIPMENT IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL CODES AND REGULATIONS.
- 1.9 SHOP DRAWINGS:
- .1 CONTRACTOR TO SUBMIT ELECTRONIC PDF SHOP DRAWINGS COMPLETE WITH TRANSMITTAL AND SEQUENTIAL NUMBERING SYSTEM FOR REVIEW.
- 1.10 TEMPORARY HEAT:
- .1 TEMPORARY HEAT FOR THE PROJECT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR. THE USE OF ANY EQUIPMENT INSTALLED ON THE JOB WILL ONLY BE PERMITTED AS NOTED IN THE ARCHITECTURAL GENERAL CONDITIONS OR IN THE INSTRUCTIONS TO BIDDERS.
- 1.11 CUTTING AND PATCHING:
- .1 ALL CUTTING AND PATCHING WILL BE THE RESPONSIBILITY OF THIS CONTRACTOR, EXCEPT CORING UP TO 8" DIAMETER WHICH WILL BE THE RESPONSIBILITY OF THIS CONTRACTOR.
- 1.12 EXCAVATION AND BACKFILLING:
- .1 ALL EXCAVATION AND BACKFILLING WILL BE THE RESPONSIBILITY OF THIS CONTRACTOR. SUPERVISION BY THIS CONTRACTOR.
- 1.13 ACCESS AND ACCESS DOORS:
- .1 ALL EQUIPMENT AND SYSTEM COMPONENTS REQUIRING SERVICING, INSPECTION OR ADJUSTING MUST BE EASILY ACCESSIBLE. WHERE EQUIPMENT OR SYSTEM COMPONENTS ARE CONCEALED IN FURRED CEILING OR IN WALLS OR PARTITIONS ACCESS DOORS WILL BE SUPPLIED BY THE MECHANICAL CONTRACTOR FOR INSTALLATION BY THIS CONTRACTOR. ALL OPENINGS SHALL BE SUFFICIENT SIZE FOR BOTH REMOVAL AND MAINTENANCE OF THE CONCEALED EQUIPMENT, AND SHALL BE A MINIMUM SIZE OF 16" X 16". PROVIDE SST DOORS FOR TILE, MARBLE OR TERRAZZO SURFACES.
- 1.14 INSTALLATION AND COMMISSIONING OF EQUIPMENT:
- .1 MANUFACTURER'S INSTRUCTIONS SHALL BE MADE AVAILABLE TO BOTH THE INSTALLING TRADESMEN AND THE ON-SITE INSPECTOR PRIOR TO INSTALLATION OF EQUIPMENT, THESE INSTRUCTIONS ARE TO BE READ, UNDERSTOOD AND CLOSELY FOLLOWED. FAILURE TO ABIDE BY THIS REQUIREMENT WILL PROVIDE JUSTIFICATION FOR THE ENGINEER TO REQUIRE REMOVAL AND RE-INSTALLATION.
- .2 ENSURE THAT ALL SAFETY DEVICES AND OTHER SIGNIFICANT ACCESSORIES ARE IN PLACE AND OPERABLE BEFORE STARTING MAJOR PIECES OF EQUIPMENT. AS PART OF THE COMMISSIONING PROCESS ACCESSORIES ARE TO BE CHECKED, CALIBRATED AND ADJUSTED AS NECESSARY TO ENSURE SAFE OPERATION.
- .3 FOLLOW MANUFACTURER'S INSTRUCTIONS IN DETAIL IN ESTABLISHING COMMISSIONING PROCEDURE.
- 1.15 IDENTIFICATION:
- .1 MANUFACTURER'S NAMEPLATE: PROVIDE ON EACH PIECE OF EQUIPMENT A METAL NAMEPLATE, MECHANICALLY FASTENED WITH RAISED OR RECESSED LETTERS.
- .2 DUCT IDENTIFICATION: USE 2" HIGH BLACK STENCILED LETTERS WITH DIRECTIONAL FLOW ARROW. STENCIL OVER FINAL FINISH ONLY.
- .3 SYSTEM NAMEPLATE: PROVIDE LAMINATED PLASTIC PLATE WITH BLACK FACE AND WHITE CENTER. MINIMUM SIZE 6" X 3" X 1/8" NOMINAL THICKNESS, ENGRAVED WITH 1/4" HIGH LETTERING. USE 1" LETTERING FOR MAJOR EQUIPMENT.
- .4 PIPE IDENTIFICATION: IDENTIFY MEDIUM IN PIPING WITH MANUFACTURED PIPE MARKERS IN ACCORDANCE WITH ASME A13.7-2007 SHOWING NAME AND SERVICE INCLUDING TEMPERATURE, PRESSURE, AND DIRECTIONAL FLOW ARROWS WHERE RELEVANT.
- .5 PIPING SYSTEMS GOVERNED BY CODES SHALL BE IDENTIFIED IN ACCORDANCE WITH GOVERNING CODE AS FOLLOWS:
- .1 NATURAL GAS / PROPANE GAS: TO CSA/CGA B149.1.
  - .2 SPRINKLERS: TO NFPA 13.
  - .3 STANDPIPE AND HOSE SYSTEMS: TO NFPA 14.
  - .4 BREATHING AIR: TO CSA Z180.1.
- 1.16 PENETRATION OF FIRE SEPARATIONS:
- .1 WHERE PIPES OR DUCTS PASS THROUGH WALLS OR FLOORS WHICH PROVIDE FIRE SEPARATIONS, DIV. 15 SHALL SEAL AROUND OPENINGS WITH ULC CLASSIFIED FIRE STOP MATERIAL IN ACCORDANCE WITH ULC LISTING INSTALLATION DETAILS. MATERIAL SHALL PROVIDE A FIRE RATING EQUAL TO THAT OF THE SEPARATION WHICH HAS BEEN PENETRATED. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE SEPARATIONS.
- .2 SUBMIT MATERIAL SHOP DRAWINGS AND ALL ULC LISTED INSTALLATION DETAILS FOR ALL PENETRATIONS APPLICABLE TO PROJECT.

- .3 ACCEPTABLE PRODUCTS: LOW CORNING FIRE STOP SYSTEM 3M FIRE BARRIER PENETRATION SEALING SYSTEM BIO-FIRE BIOTHERM OR BIO-K10 (SUPPLIED BY WORMALD)
- 1.17 DEMONSTRATION OF COMPLETE SYSTEMS:
- .1 AT THE CONCLUSION OF THE JOB, THE CONTRACTOR SHALL REVIEW AND DEMONSTRATE TO THE OWNER ALL EQUIPMENT AND THEIR RESPECTIVE FUNCTIONS AND OPERATION. SUCH DEMONSTRATION SHALL BE PROVIDED FOR SUCH REASONABLE PERIODS OF TIME AS THE COMPLEXITY OF THE JOB WARRANTS, AND AS APPROVED BY THE ENGINEER. SUCH REVIEW AND DEMONSTRATION SHALL BE MADE BY AN AUTHORIZED REPRESENTATIVE OF THE CONTRACTOR, FULLY KNOWLEDGEABLE OF THE PROJECT, ITS INSTALLATION AND OPERATION.
- .2 PROVIDE THE ENGINEER WITH A SCHEDULE OF SYSTEM DEMONSTRATION AT LEAST TWO (2) WEEKS PRIOR TO DEMONSTRATION.
- 1.18 FINAL INSPECTION:
- .1 PRIOR TO SUBSTANTIAL COMPLETION AND FINAL INSPECTION OF THE PROJECT, CONTRACTOR WILL INSPECT THE PROJECT, PROVIDE A MECHANICAL DEFICIENCY LIST. PROVIDE CONFIRMATION THAT ALL ITEMS ON THE LIST HAVE BEEN CORRECTED AND PROVIDE THE OPERATION AND MAINTENANCE MANUALS. PROVIDE THE RECORD DRAWINGS AND PROVIDE THE DEMONSTRATION OF THE COMPLETE MECHANICAL SYSTEMS.
- .2 ALL OF THE ABOVE MUST BE COMPLETED PRIOR TO THE FINAL INSPECTION BY THE ENGINEER AND SUBSTANTIAL COMPLETION OF THE MECHANICAL SYSTEMS.
- 1.19 OPERATION AND MAINTENANCE MANUALS:
- .1 CONTRACTOR TO PROVIDE MAINTENANCE MANUALS FOR ALL EQUIPMENT INSTALLED. THREE (3) COPIES ORGANIZED IN 8 1/2" X 11" BINDERS TO BE PROVIDED.
- 1.20 RECORD DRAWINGS:
- .1 CONTRACTOR TO PROVIDE AS-BUILT RECORD DRAWINGS.
- 1.21 GUARANTEE:
- .1 THE CONTRACTOR SHALL GUARANTEE ALL HIS WORK FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR (UNLESS SPECIFICALLY NOTED OTHERWISE) FROM THE DATE OF SUBSTANTIAL PERFORMANCE OF THE WORK AS DETERMINED BY THE CONSULTANT AND SHALL MAKE GOOD ALL DEFECTS OTHER THAN NORMAL WEAR AND TEAR DURING THE LIFE OF THE GUARANTEE.
- .2 THE CONTRACTOR SHALL GUARANTEE ALL WORK AND EQUIPMENT SUPPLIED BY HIM TO WORK QUIETLY AND SATISFACTORILY AND TO ACCOMPLISH THE WORK FOR WHICH IT WAS INSTALLED DURING THE LIFE OF THE ABOVE GUARANTEE. AT ANY TIME DURING THIS PERIOD, HE SHALL MAKE ANY NECESSARY CHANGES AND ADJUSTMENTS, OR REPLACEMENTS, TO ACCOMPLISH THIS AT HIS OWN EXPENSE.
- 2.0 INSULATION:
- 2.1 DEFINITIONS:
- .1 UNLESS OTHERWISE SPECIFIED, TERMS "EXPOSED PIPE" OR "EXPOSED DUCTWORK" AS USED IN THIS SECTION SHALL REFER TO PIPE OR DUCTWORK IN FINISHED SPACES AND SHALL INCLUDE ALL AREAS EXCEPT: FURRED SPACES, PIPE AND DUCT SHAFTS, SPACES ABOVE FURRED CEILINGS, SPACES OVER EXCAVATED AREAS, AND CRAWL SPACES. THESE AREAS WILL BE REFERRED TO AS "CONCEALED SPACES". WORKING CHASES OR CORES SHALL BE CONSIDERED AS FINISHED SPACES.
- 2.2 FIRE RATING:
- .1 ALL INSULATION TO HAVE MAXIMUM FLAME SPREAD RATING 25. MAXIMUM SMOKE DEVELOPED RATING 50.
- 2.3 PIPING:
- .1 PROVIDE PREFORMED GLASS FIBER PIPE INSULATION WITH A NOMINAL DENSITY OF 88 KG/M<sup>3</sup>, GLASS FIBER REINFORCED KRAFT FOIL LAMINATE JACKET AND CONTINUOUS VAPOUR BARRIER ON ALL:
- .1 FAN COIL CONDENSATE
- .2 REFRIGERANT LIQUID AND GAS PIPING:
- .1 PIPE AND FITTING INSULATION SHALL BE ELASTOMERIC PIPE INSULATION WITH AN OPERATING TEMPERATURE RANGE OF -56C (-70F) TO 104C (220F). ULC FLAME SPREAD RATING OF 25 OR LESS, DENSITY OF 48 KG/M<sup>3</sup> (3LB/CU.FT). OUTDOOR INSULATION SHALL HAVE UV PROTECTION BARRIER.
  - .2 ACCEPTABLE PRODUCTS: ARMAFLEX AP.
  - .3 PROTECTIVE JACKETING: OUTDOORS - FABRICATED ALUMINUM ENCLOSURE.
- .3 PIPE INSULATION THICKNESS REQUIREMENTS:
- | INSULATION TYPE  | RUNOUTS* ≤50MM (2") | PIPE SIZE   |               |               |               |
|--|---------------------|-------------|---------------|---------------|---------------|
|  |                     | ≤ 25mm (1") | ≤ 50mm (2")   | ≤ 100mm (4")  | ≥125mm (5")   |
| REFRIGERANT HEATING/COOLING SYSTEMS (ELASTOMERIC INSULATION) | 25MM (1")           | 25mm (1")   | 38mm (1 1/2") | 38mm (1 1/2") | 38mm (1 1/2") |
| COOLING SYSTEM HVAC CONDENSATE                               | 25MM (1")           | 25MM (1")   | 25MM (1")     | 25MM (1")     | 25MM (1")     |
- .4 PROVIDE PVC JACKET WITH PREFORMED FITTING COVERS ON ALL EXPOSED PIPING
- 2.4 EXECUTION:
- .1 INSTALL INSULATION IN ACCORDANCE WITH THE THERMAL INSULATION ASSOCIATION OF CANADA (TIAC) BEST PRACTICES GUIDE. UNLESS SPECIFIC INSULATION DETAILS INDICATED ON DRAWINGS SUBMIT PROPOSED INSULATION DETAILS TO ENGINEER FOR REVIEW PRIOR TO INSTALLATION. INSTALLATION DETAILS SHALL BE IN ACCORDANCE WITH APPLICABLE TIAC STANDARD INSTALLATION DETAILS.
- 3.0 PLUMBING:
- 3.1 GENERAL:
- ALL WORK TO BE COMPLETED IN ACCORDANCE WITH NBC, CPC, AND AUTHORITIES HAVING JURISDICTION.
- 3.2 PIPING:
- .1 HVAC UNIT CONDENSATE DRAINAGE:
- .1 PVC DWV.
- 3.3 HANGERS:
- .1 CLEVIS TYPE WITH THREADED RODS.
- 4.0 HVAC:
- 4.1 GENERAL:
- .1 DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA CONSTRUCTION STANDARDS FOR LOW PRESSURE DUCTWORK (2IN. W.C.).
  - .2 DUCTWORK AND HANGER MATERIALS TO BE GALVANIZED STEEL UNLESS OTHERWISE INDICATED.
  - .3 ALL DUCTWORK SHALL BE SEALED. ZERO LEAKAGE PERMITTED AT 2IN. W.C. ON DISCHARGE SIDE OF FAN.
  - .4 DUCTWORK CONSTRUCTION AND INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA 91 (STANDARD FOR EXHAUST SYSTEMS FOR AIR CONVEYING VAPORS, GASES, AND MISTS).
- 4.2 HANGERS AND SUPPORTS:
- .1 PROVIDE FABRICATED HANGERS AND SUPPORTS IN ACCORDANCE WITH SMACNA CONSTRUCTION STANDARDS.

- 4.3 REFRIGERATION PIPING:
- .1 PIPE - ASTM B280 DRAWN REFRIGERANT GRADE COPPER ALLOY SEAMLESS PIPE, MADE OF PHOSPHORUS DEOXIDIZED COPPER. PIPING TO BE CLEAN AND FREE FROM HAZARDOUS SULFUR, OXIDE, DUSTS, SHAVING PARTICLES, OILS, AND MOISTURE (CONTAMINATION).
- .2 FITTINGS - ASME B16.22 WROUGHT COPPER. LONG RADIUS TYPE FOR ELBOWS AND RETURN BENDS. - FLARED FITTING PERMITTED FOR USE WITH SOFT ANNEALED COPPER TUBING. FLEXIBLE CONNECTIONS 3/8" NOMINAL OR LESS SHALL BE MADE USING COILED SOFT COPPER FOR LARGE SIZES, SEAMLESS FLEXIBLE BRONZE HOSE WITH BRONZE WIRE BRAID COVERING IS TO BE USED. USE FACTORY SEALED NEOPRENE JACKET UNITS WHERE FREEZING MAY OCCUR.
- .3 JOINTS - BRAZED, AWS A5.8 BCUP SILVER/PHOSPHORUS/COPPER ALLOY WITH MELTING RANGE 119F TO 148F.
- .4 VALVES - MEET ANSI B31-5 VALVE CONSTRUCTION. - GENERAL SERVICE VALVES FORGED BRASS UP TO CLASS 500, 500 PSI PACKLESS AND CAST BRONZE UP TO CLASS 375, 350 PSI. - PROVIDE ISOLATION HERMETIC BALL VALVES COMPLETE WITH INTEGRAL ACCESS PORTS AT ALL VRF HEAT PUMP SYSTEM INDOOR UNITS. STANDARD OF ACCEPTANCE: EMERSON BVS SERIES.
- .5 HANGERS - PIPE HANGERS TO BE MYATT OR GRINELL AND EQUAL TO THE FOLLOWING MYATT CAT. NO.
- .1 UNINSULATED PIPING - 151CT.
  - .2 INSULATED PIPING COMPLETE WITH INSULATION SHIELDS - 122.
- 4.4 TESTING, ADJUSTING, & BALANCING:
- .1 AIR DISTRIBUTION SYSTEMS:
- .1 TEST AND BALANCE ALL AIR SUPPLY, RETURN AND EXHAUST SYSTEMS SPECIFIED. EACH OUTLET SHALL BE ADJUSTED BY A FLOW HOOD. ANEMOMETER READINGS TO PROVIDE AIR QUANTITIES SPECIFIED. UPON COMPLETION OF THE BALANCING, SUPPLY THE ENGINEER WITH THREE (3) COMPLETE RECORDS WHICH SHALL INCLUDE AIR QUANTITIES AT EACH OUTLET, FAN PERFORMANCE AND OPERATING CONDITIONS, AND MOTOR ELECTRICAL DATA.
- 4.5 SPLIT HEAT PUMP/AIR CONDITIONER:
- .1 REFER TO SPLIT HEAT PUMP/AIR CONDITIONER SCHEDULE ON DRAWINGS.
  - .2 PROVIDE START-UP BY MANUFACTURER AUTHORIZED TECHNICIAN. SUBMIT START-UP REPORTS TO ENGINEER.
  - .3 ACCEPTABLE PRODUCTS: DAKIN, MITSUBISHI
- 5.0 AUTOMATIC CONTROLS:
- 5.1 GENERAL:
- .1 ALL CONTROL WIRING REGARDLESS OF VOLTAGE REQUIRED FOR THE OPERATION OF THE MECHANICAL SYSTEMS SHALL BE PROVIDED BY THIS CONTRACTOR UNLESS OTHERWISE INDICATED. WIRING SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF DIVISION 16- ELECTRICAL AND INSTALLED IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE. GENERALLY, ALL CONTROLS WILL BE LOW VOLTAGE (50V AND BELOW). CONTROLS CONTRACTOR SHALL PROVIDE CONTROL DAMPERS, ACTUATORS, CONTROL VALVES, THERMOSTATS, RELAYS, SWITCHES, TIMERS, TRANSFORMERS, SENSORS, ETC. AS REQUIRED TO COMPLETE CONTROL SYSTEM AS INDICATED OR REQUIRED.
- 5.2 RELATED WORK:
- .1 SUPPLY OF CONTROL VALVES, PIPING WELLS, AND SIMILAR CONTROL COMPONENTS IN LIQUID HEAT TRANSFER SYSTEM PIPING AND EQUIPMENT.
  - .2 STAND-ALONE AND CONTROLS.
  - .3 THE WORK INCLUDED IN THIS CONTRACT SHALL INCLUDE THE FURNISHING OF ALL LABOUR, MATERIALS, ETC. NECESSARY FOR THE COMPLETION OF THE AUTOMATIC CONTROL SYSTEMS REQUIRED FOR THE OPERATION OF THE MECHANICAL SYSTEM.
  - .4 CONTROLS CONTRACTOR SHALL PROVIDE WIRING, CONTROL DAMPERS, ACTUATORS, CONTROL VALVES, THERMOSTATS, RELAYS, SWITCHES, CONTROLLERS, TIMERS, TRANSFORMERS, SENSORS, DEVICES, ETC. AS REQUIRED TO COMPLETE THE CONTROLS SECTION AND ACHIEVE THE SEQUENCES OF OPERATION AS INDICATED OR REQUIRED.
- 5.3 WARRANTY AND MAINTENANCE:
- .1 PROVIDE A WRITTEN GUARANTEE STATING THAT THE CONTROLS ARE GUARANTEED AGAINST FAULTY MATERIAL AND WORKMANSHIP OF ONE (1) YEAR FROM THE LATEST OF:
    - .1 DATE OF SUBSTANTIAL COMPLETION.
    - .2 THE DATE ON WHICH ALL SYSTEMS ARE DEMONSTRATED TO BE OPERATING CORRECTLY. FOR THE PURPOSE OF ESTABLISHING THE LATTER DATE, THE CONTRACTOR SHALL ARRANGE TO DEMONSTRATE FULL AND COMPLETE OPERATION TO THE OWNER AND ENGINEER. THIS DEMONSTRATION TO TAKE PLACE AFTER ALL CONTROLLED ITEMS ARE IN PACE AND OPERATING.
- 5.4 SCOPE OF WORK:
- .1 PROVIDE A STANDALONE CONTROL SYSTEM.
- 5.5 PRODUCTS:
- .1 THERMOSTATS:
    - .1 SPLIT HEAT PUMP - SUPPLIED WITH EQUIPMENT, POWERED THROUGH INDOOR UNIT.
- 5.6 SEQUENCE OF OPERATION:
- .1 SPLIT HEAT PUMP SYSTEMS:
    - .1 SYSTEM SUPPLIED WITH 7 DAY PROGRAMMABLE THERMOSTAT. OPERATING HOURS TO BE CONFIRMED WITH OWNER DURING COMMISSIONING. ON A CALL FOR HEATING OR COOLING FROM THE SPACE THERMOSTAT, THE HEAT PUMP IS TO BE ENERGIZED TO MAINTAIN SPACE SETPOINT. BACKUP HEAT PROVIDED BY THE EXISTING FURNACE TO BE ENERGIZED AS REQUIRED TO MAINTAIN SPACE SETPOINT WHEN ADDITIONAL CAPACITY IS REQUIRED.
- 5.7 IDENTIFICATION
- .1 PERMANENTLY IDENTIFY EACH WIRE, CABLE AND CONDUIT AT EACH TERMINATION, AND PERMANENTLY IDENTIFY ALL FIELD SERVICES.
- 5.8 INSTRUCTION AND TRAINING:
- .1 TRAINING IN THE OPERATION OF THE SYSTEM SHALL BE PROVIDED. DETAILED INSTRUCTIONS AND TRAINING SHALL BE PROVIDED TO DESIGNATED TECHNICAL PERSONNEL TO ENABLE THEM TO BECOME FULLY CONVERSANT WITH SYSTEMS.
- 6.0 ELECTRICAL:
- .1 LINE VOLTAGE POWER WIRING SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
  - .2 ALL CONTROL WIRING (REGARDLESS OF VOLTAGE) SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR.
  - .3 ALL WIRING AND DEVICES SHALL BE INSTALLED AS INDICATED OR REQUIRED IN ACCORDANCE WITH THE LATEST ADDITION OF THE CANADIAN ELECTRICAL CODE.



ISSUED FOR TENDER  
2023-09-07



Project Title :  
**Kings County Forestry Depot**

Drawing Title :  
**Specifications**

Scale : AS NOTED Design By : AA  
Drawn By : LJDJ Date : SEPTEMBER, 2023

Project No.: (23-197) Drawing No.:  
**2400 - 23070 M-2**