

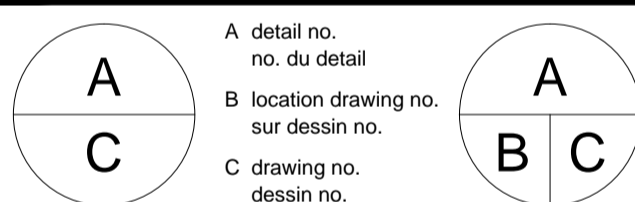
**BUILDING KEY PLAN**



**KEY WEST ENGINEERING LTD.**  
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| REV | Description              | Date        |
|-----|--------------------------|-------------|
| 2   | RE-IFT - ADDED GUARDRAIL | 04-MAR-2016 |
| 1   | RE-ISSUED FOR TENDER     | 02-FEB-2016 |
| 0   | ISSUED FOR TENDER        | 16-JAN-2016 |

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project  
**AIR COOLED CONDENSING UNIT REPLACEMENT**  
 ENVIRONMENT CANADA  
 115 Perimeter Rd.  
 Saskatoon SK. S7N 0X4  
 drawing  
 dessin

**MECHANICAL**

|                 |                          |                           |  |
|-----------------|--------------------------|---------------------------|--|
| Designed By     | KEY WEST ENGINEERING LTD | Conçu par                 |  |
| Date            | 2015/12/16               | (yyyy/mm/dd)              |  |
| Drawn By        | LDR                      | Dessiné par               |  |
| Date            | 2015/12/16               | (yyyy/mm/dd)              |  |
| Reviewed By     | RJC                      | Examiné par               |  |
| Date            | 2015/12/16               | (yyyy/mm/dd)              |  |
| Approved By     | RJC                      | Approuvé par              |  |
| Date            | 2015/12/16               | (yyyy/mm/dd)              |  |
| Tender          | IFT                      | Soumission                |  |
| Project Manager | N. Fehr                  | Administrateur de projets |  |

|                  |           |                     |         |
|------------------|-----------|---------------------|---------|
| EC PMDI Proj no. | PNWRC-004 | Consultant Proj no. | 691-161 |
| Drawing no.      |           | No. du dessin       |         |

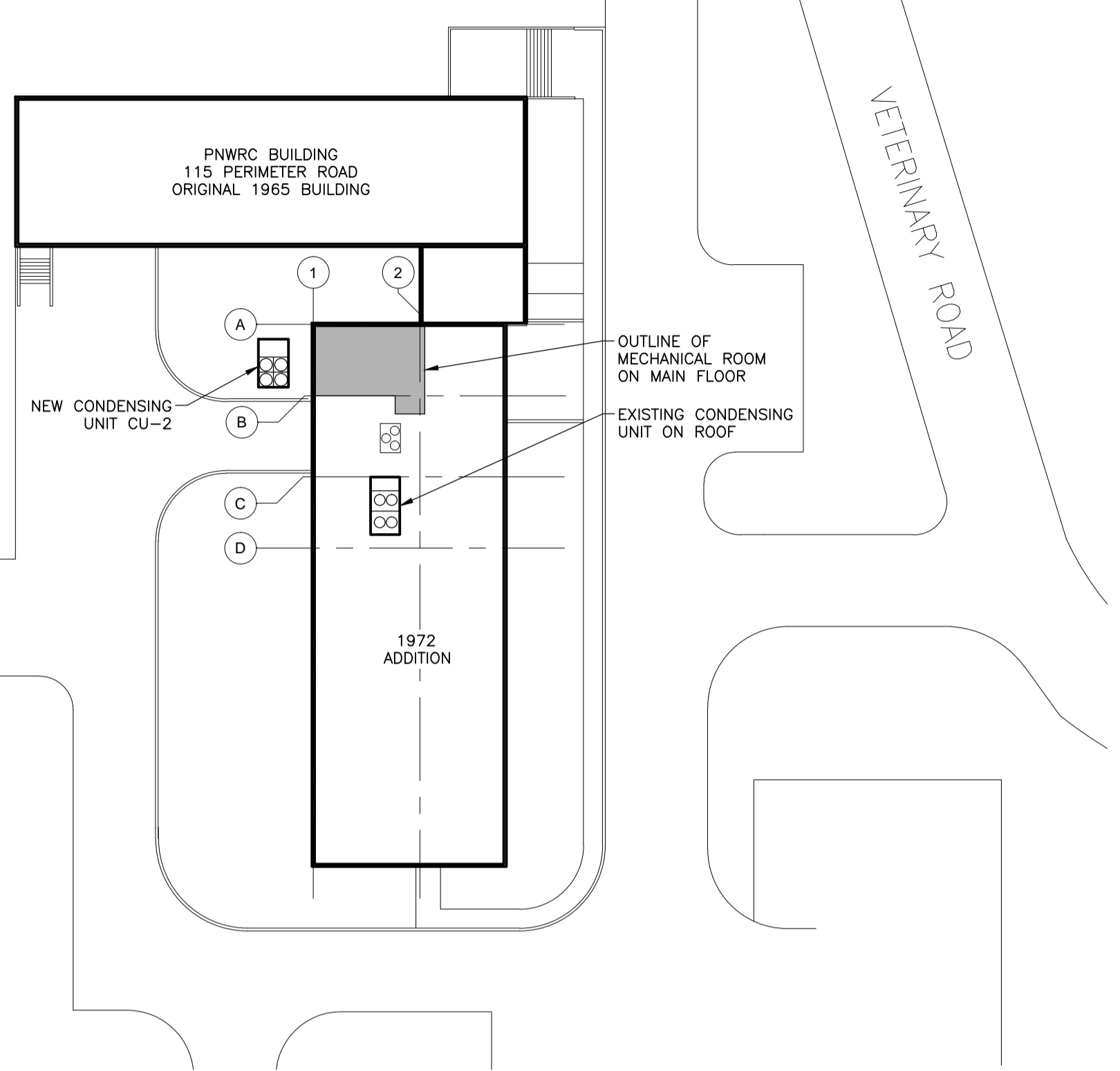
**M1**

**MECHANICAL LEGEND**

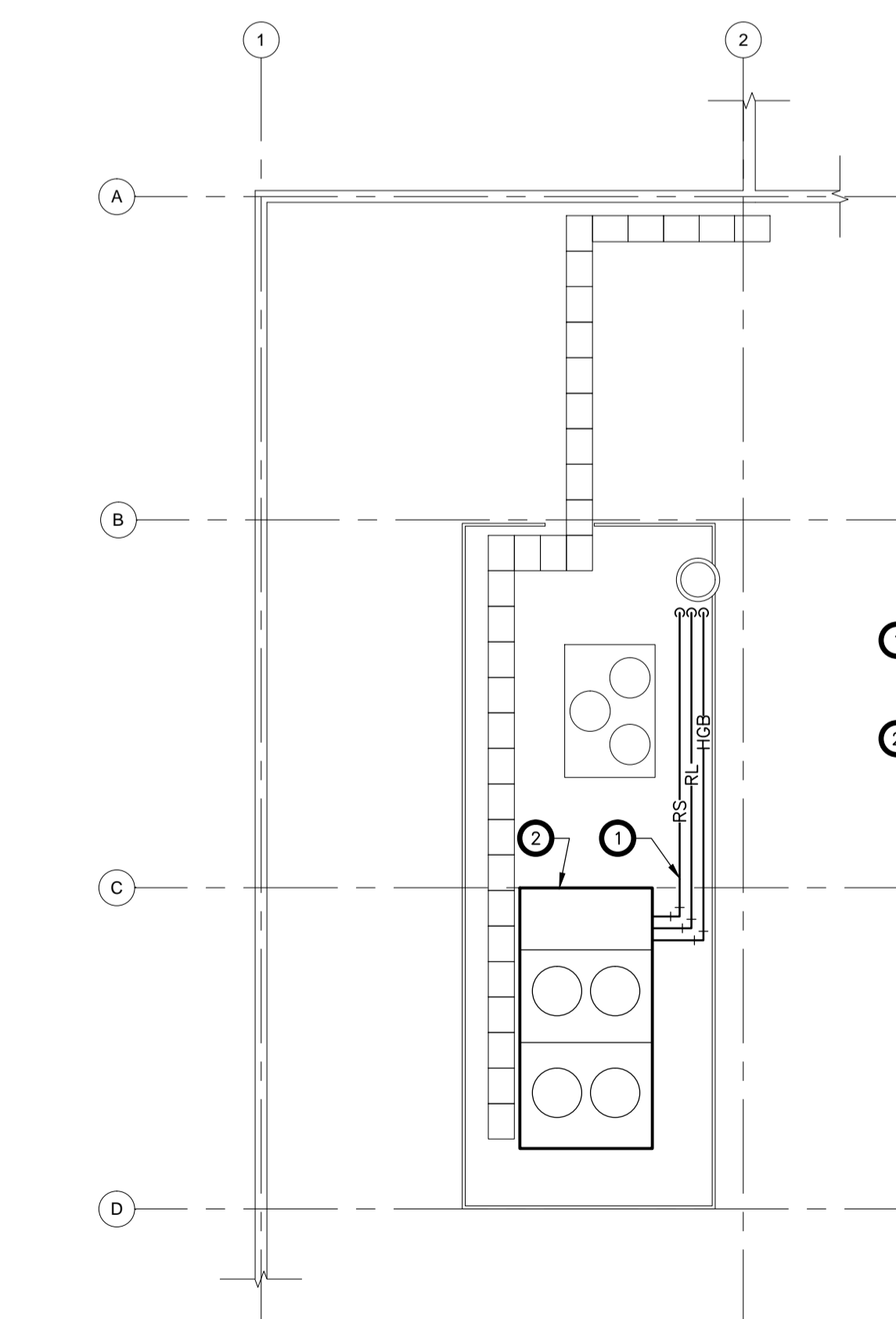
|  |                           |
|--|---------------------------|
|  | DUCT SECTION - POS. PRES. |
|  | DUCT SECTION - NEG. PRES. |
|  | REFRIGERANT LIQUID        |
|  | REFRIGERANT SUCTION       |
|  | HOT GAS BYPASS            |

**GENERAL NOTE:**  
 LOCATE EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING WORK. COORDINATE WITH UNIVERSITY OF SASKATCHEWAN FACILITIES MANAGEMENT DIVISION AND ADHERE TO THE UNIVERSITY OF SASKATCHEWAN UNDERGROUND UTILITY ASSESSMENT POLICY.

- KEY NOTES**
- DECOMMISSION, REMOVE AND DISPOSE OF EXISTING DX COIL AND ALL ASSOCIATED REDUNDANT REFRIGERANT PIPING. SUPPLY AND INSTALL NEW DX COOLING COIL CC-2 IN EXISTING AIR HANDLING UNIT. PROVIDE ALL LABOUR AND MATERIALS NECESSARY TO MODIFY EXISTING AHU CABINET TO SUIT NEW COIL. MAKE REPAIRS TO AHU CABINET AS REQUIRED TO MAINTAIN CABINET INTEGRITY.
  - SUPPLY AND INSTALL NEW AIR COOLED CONDENSING UNIT CU-2 C/W ELASTOMERIC VIBRATION ISOLATION PADS ON CONCRETE EQUIPMENT PAD WITH COMPACTED GRANULAR BASE. SEE EQUIPMENT PAD DETAIL ON DRAWING S1.
  - ROUTE REFRIGERANT PIPING AT HIGH ELEVATION ABOVE EXISTING TRANSFORMER TO MAINTAIN VERTICAL SERVICE CLEARANCE. SEE 4/M1.
  - PROVIDE UNISTRUT CHANNEL FRAME PIPE SUPPORT AT BUILDING AND ON EQUIPMENT PAD. SUPPORT PIPE MID-SPAN WITH DURA-BLOK PIPE SUPPORTS OR EQUAL.
  - PROVIDE FLEX CONNECTION IN REFRIGERANT PIPING AT CONDENSING UNIT.
  - RETAIN THE SERVICES OF A CERTIFIED ARBORIST TO PRUNE ELM TREE ROOTS PRIOR TO EXCAVATING EQUIPMENT PAD.
  - PROVIDE GUARDRAIL REFER TO EQUIPMENT SCHEDULE. ANCHOR TO TOP OF EXISTING RETAINING WALL.



**1 SITE PLAN**  
 SCALE: 1:400



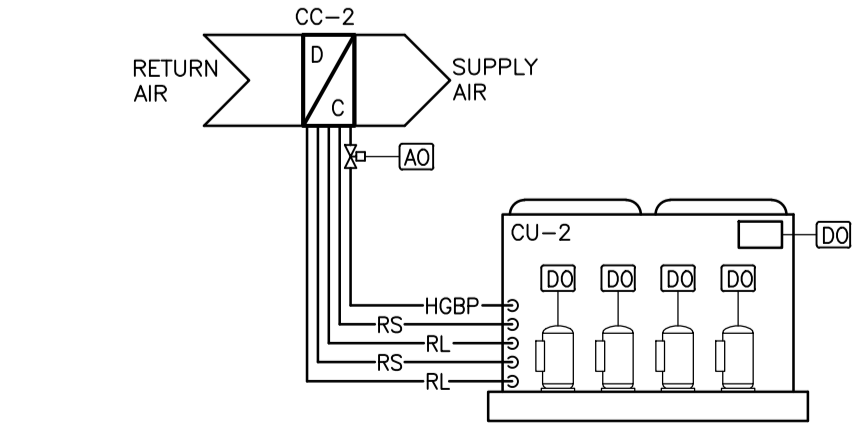
**3 PARTIAL ROOF PLAN - DEMOLITION**  
 SCALE: 1:100

- KEY NOTES**
- DECOMMISSION, REMOVE AND DISPOSE OF REDUNDANT REFRIGERANT PIPING ASSOCIATED WITH EXISTING 40 TON CONDENSING UNIT. SEAL ROOF PENETRATIONS AND MAKE GOOD.
  - REMOVE AND DISPOSE OF EXISTING AIR COOLED CONDENSING UNIT ON ROOF.

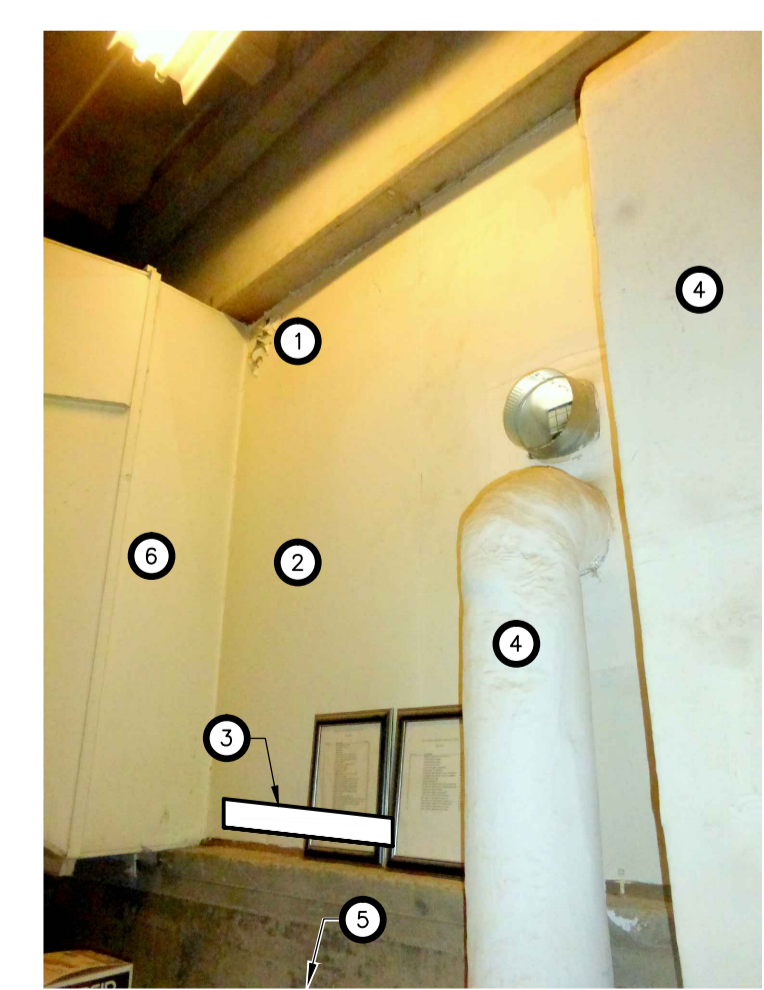
**2 MECHANICAL ROOM PLAN**  
 SCALE: 1:50

**CONDENSING UNIT CU-2 SEQUENCE OF OPERATION**

- CONDENSING UNIT CU-2 SHALL BE INTEGRATED INTO THE EXISTING JOHNSON CONTROLS BUILDING AUTOMATION SYSTEM AND THE AIR HANDLING SYSTEM.
- THE EXISTING ECONOMIZER CYCLE, THE STAGES OF THE CONDENSING UNIT AND THE HOT GAS BYPASS SHALL OPERATE IN SEQUENCE TO MAINTAIN THE SUPPLY AIR SET POINT TEMPERATURE.
- PROVIDE ON/OFF/AUTO OVERRIDE FUNCTION IN DDC INTERFACE.
- DISPLAY ON THE DDC INTERFACE SHALL INCLUDE THE FOLLOWING INFORMATION FROM THE CONDENSING UNIT:
  - LOW AMBIENT TEMPERATURE CUTOFF SETTING
  - OUTDOOR AIR TEMPERATURE
  - ANTI-RECYCLE TIMER STATUS FOR EACH CIRCUIT
  - COMPRESSOR RUN STATUS
  - HOT GAS VALVE STATUS
  - CONDENSER FAN STATUS



**CONDENSING UNIT CU-2 CONTROL SCHEMATIC**  
 NTS



- KEY NOTES**
- ROUTE REFRIGERANT PIPING TO MECHANICAL ROOM WEST WALL AT HIGH ELEVATION.
  - ROUTE REFRIGERANT PIPING DOWN FACE OF BLANKED OFF LOUVER ON MECHANICAL ROOM WEST WALL.
  - ROUTE REFRIGERANT PIPING THROUGH BLANKED OFF LOUVER AT LOW ELEVATION. PROVIDE WEATHER TIGHT SEAL AT LOUVER PENETRATION.
  - EXISTING COMBUSTION AIR DUCT.
  - EXISTING TRANSFORMER BELOW.
  - EXISTING EXHAUST AIR DUCT.

**4 MECHANICAL ROOM WEST WALL DETAIL**  
 SCALE: NTS

Plotted by: Robert F. Cowan Mar 04, 2016 - 10:14am

1.0 GENERAL

1.1 GENERAL PROVISIONS

- 1 GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, GENERAL REQUIREMENTS, INSTRUCTIONS TO BIDDERS SHALL GOVERN WORK UNDER THE MECHANICAL SECTION.
2 PROVIDE COMPLETE AND FULLY OPERATIONAL MECHANICAL SYSTEMS WITH FACILITIES AND SERVICES TO MEET REQUIREMENTS DESCRIBED HEREIN AND IN COMPLETE ACCORD WITH APPLICABLE CODES AND ORDINANCES.
3 CONTRACT DOCUMENTS OF THIS DIVISION ARE DIAGRAMMATIC AND APPROXIMATELY TO SCALE UNLESS DETAILED OTHERWISE. THEY ESTABLISH SCOPE, MATERIAL, AND INSTALLATION QUALITY AND ARE NOT DETAILED INSTALLATION INSTRUCTIONS. SHOULD CONFLICTS IN DOCUMENTS OR REGULATIONS OCCUR, THE MORE STRINGENT REQUIREMENT SHALL APPLY.
4 FOLLOW MANUFACTURER'S RECOMMENDED INSTALLATION DETAILS AND PROCEDURES FOR EQUIPMENT SUPPLEMENTED BY DETAILS GIVEN HEREIN AND ON PLANS SUBJECT TO APPROVAL OF THE CONSULTANT.
5 INSTALL EQUIPMENT GENERALLY IN LOCATIONS AND ROUTES SHOWN, CLOSE TO BUILDING STRUCTURES WITH MINIMUM INTERFERENCE WITH OTHER SERVICES OR FREE SPACE. REMOVE AND REPLACE IMPROPERLY INSTALLED EQUIPMENT TO THE SATISFACTION OF THE CONSULTANT AT NO EXTRA COST.
6 CONNECT TO EQUIPMENT FURNISHED IN OTHER SECTION AND BY OWNER, INCLUDING UNCRATING EQUIPMENT, MOVING IN PLACE COMPLETE INSTALLATION, START-UP AND TESTING.

1.2 MATERIAL AND WORKMANSHIP

- 1 REPLACE MATERIALS OR WORKMANSHIP BELOW SPECIFIED QUALITY AND RELOCATE WORK WRONGLY PLACED TO SATISFACTION OF THE CONSULTANT.
2 MATERIALS AND EQUIPMENT INSTALLED SHALL BE NEW, FULL WEIGHT AND OF THE BEST QUALITY SPECIFIED. USE SAME BRAND OR MANUFACTURER FOR EACH SPECIFIC APPLICATION. STATICALLY AND DYNAMICALLY BALANCE ROTATING EQUIPMENT FOR MINIMUM VIBRATION AND LOW OPERATING NOISE LEVEL. PROVIDE VIBRATION ISOLATION FOR EQUIPMENT WHERE REQUIRED.
3 EACH MAJOR COMPONENT OF EQUIPMENT SHALL HAVE MANUFACTURER'S NAME, ADDRESS, CATALOGUE AND SERIAL NUMBER IN A CONSPICUOUS PLACE.
4 USE BEST PRACTICE AND INSTALL MATERIALS AND EQUIPMENT IN A NEAT AND WORKMANLIKE MANNER BY COMPETENT SPECIALISTS AND TRADESMEN LICENSED FOR THIS TYPE OF WORK.
5 WORK ON REFRIGERATION SYSTEMS SHALL BE CARRIED OUT BY EXPERIENCED REFRIGERATION TRADES, FULLY QUALIFIED. WORK SHALL BE DONE IN STRICT ACCORDANCE WITH APPLICABLE REGULATIONS AND THE CURRENT MECHANICAL REFRIGERATION CODE CSA B52.

1.3 CUTTING AND PATCHING

- 1 LOCATE AND PROVIDE HOLES AND SLEEVES, CUTTING AND FITTING REQUIRED FOR MECHANICAL WORK. RELOCATE IMPROPERLY LOCATED HOLES AND SLEEVES AT NO EXTRA COST. PROVIDE ANY FLASHING FOR WORK BY THIS SECTION.
2 DRILL FOR EXPANSION BOLTS, HANGER RODS, BRACKETS AND SUPPORTS.
3 DO NO CUTTING OR BURNING OF STRUCTURAL MEMBERS OR BUILDING FRAME WITHOUT OBTAINING PRIOR WRITTEN APPROVAL FROM THE CONSULTANT.
4 PROVIDE OPENINGS AND HOLES REQUIRED IN CONCRETE OR PRECAST MEMBERS FOR MECHANICAL WORK. CAST HOLES LARGER THAN 425 MM IN DIAMETER. FIELD CUT SMALLER THAN 425 MM.
5 ALL PATCHING OF BUILDING FINISHES SHALL BE PERFORMED BY QUALIFIED TRADES FOR THE FINISHED MATERIAL INVOLVED.

1.4 PERMITS AND FEES

- 1 GIVE ALL NECESSARY NOTICES, OBTAIN ALL NECESSARY PERMITS AND PAY ALL FEES IN ORDER THAT THE WORK HEREINAFTER SPECIFIED MAY BE INSTALLED CONFORMING TO THE LAWS AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION BEFORE FINAL ACCEPTANCE CERTIFICATES ARE ISSUED.

1.5 LIABILITY

- 1 ASSUME FULL RESPONSIBILITY FOR LAYING OUT THIS WORK AND FOR DAMAGE CAUSED TO THE OWNER OR OTHER CONTRACTORS BY IMPROPER EXECUTION OF THE WORK. NOTHING HEREIN SHALL IMPLY ANY THIRD PARTY LIABILITY BETWEEN THE CONTRACTOR AND CONSULTANT.
2 PROTECT FINISHED AND UNFINISHED WORK OF HIS OWN AND OTHER CONTRACTORS FROM DAMAGE DUE TO THE EXECUTION OF HIS WORK.
3 VISIT SITE AND EXAMINE AND OBTAIN KNOWLEDGE OF CONDITIONS AFFECTING WORK. NO ALLOWANCE WILL BE MADE FOR WORK ARISING OUT OF FAILURE TO OBTAIN THIS KNOWLEDGE.

1.6 PRODUCT STANDARDS/SHOP DRAWINGS

- 1 PRODUCTS SHALL BE AS SPECIFIED UNLESS EQUIVALENTS ARE APPROVED BY THE CONSULTANT IN WRITING THREE DAYS PRIOR TO CLOSE OF TENDER.
2 SUBMIT FOR REVIEW ELECTRONIC SHOP DRAWINGS AND FOUR (4) SETS OF OPERATING AND MAINTENANCE INSTRUCTIONS. ELECTRONIC SUBMISSION OF SHOP DRAWINGS IN PDF FORMAT IS ACCEPTABLE. REVIEW ALL DRAWINGS PRIOR TO SUBMITTING, NOTE ALL CHANGES, STAMP AND SIGN.
3 LABEL AND IDENTIFY EACH PIECE OF EQUIPMENT SUBMITTED, INCLUDE SUPPLIER, AGENT, CONTRACTOR, JOB NAME AND PHONE NUMBERS.

1.7 MAINTENANCE MANUALS AND OPERATION INSTRUCTIONS

- 1 SUBMIT FOUR (4) COPIES OF MANUALS IN THREE RING BINDERS FOR ALL EQUIPMENT INSTALLED BY THE MECHANICAL CONTRACTOR TO THE CONSULTANT FOR APPROVAL. PROJECT TITLE SHALL BE ON SPINE AND COVER.

INCLUDE:

- SYSTEMS DESCRIPTION
- MAINTENANCE AND LUBRICATION SCHEDULES
- MANUFACTURER OPERATING AND MAINTENANCE INSTRUCTIONS
- SHOP DRAWINGS
- BALANCING AND TEST REPORTS; PERMITS
- EQUIPMENT AND VALVE IDENTIFICATION
- PARTS LIST

- 2 INSTRUCT OWNER'S REPRESENTATIVE ON THE COMPLETE OPERATION OF THE MECHANICAL SYSTEM AT TURNOVER TO THE OWNER AND AT THE NEXT MAJOR SEASONAL CHANGE.

1.8 GUARANTEE

- 1 PROVIDE THE OWNER WITH A WRITTEN GUARANTEE, WARRANTING ALL APPARATUS FURNISHED UNDER THE CONTRACT IN PERFECT AND SERVICEABLE CONDITION FOR A PERIOD OF ONE (1) YEAR FROM DATE OF FINAL ACCEPTANCE OF HIS WORK BY THE CONSULTANT.
2 DURING THE GUARANTEE PERIOD THE OWNER SHALL OPERATE AND SERVICE THE EQUIPMENT INSTALLED. THIS SECTION SHALL BE RESPONSIBLE FOR REPLACING OR REPAIRING ANY DEFECTIVE MATERIAL OR WORKMANSHIP DURING THIS PERIOD AT NO COST TO THE OWNER.

1.9 RECORD DRAWINGS

- 1 KEEP AN EXTRA SET OF WHITE PRINTS AND SPECIFICATIONS IN THE JOB OFFICE AND RECORD DAILY ALL CHANGES AND DEVIATIONS. AT COMPLETION OF THE PROJECT, TURNOVER TO THE CONSULTANT ONE (1) SET OF NEAT "AS-BUILT" RECORD DRAWINGS.

1.10 EQUIPMENT AND PROTECTION CLEAN-UP

- 1 PROTECT ALL EQUIPMENT AND MATERIALS IN STORAGE ON SITE DURING AND AFTER INSTALLATION UNTIL ACCEPTANCE BY THE OWNER.
2 BE RESPONSIBLE FOR CLEANING UP AND REMOVING DEBRIS AFTER COMPLETION OF THIS SECTION OF WORK.
3 PIPING, AND EQUIPMENT SHALL BE THOROUGHLY CLEANED OF DIRT, CUTTINGS AND OTHER FOREIGN SUBSTANCES.

1.11 TESTING AND BALANCING

- 1 TEST ALL EQUIPMENT AND MATERIAL WHERE REQUIRED BY SPECIFICATION OR AUTHORITY HAVING JURISDICTION TO DEMONSTRATE ITS PROPER OPERATION.
2 TEST PROCEDURES SHALL BE IN ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, ASME, ASHRAE, AMCA, OR OTHER RECOGNIZED TEST CODES AS FAR AS FIELD CONDITIONS PERMIT.
3 REPAIR AND TEST DEFECT UNTIL SATISFACTORY.

1.0 GENERAL CONT'D

1.13 ELECTRICAL WORK

- 1 ALL LINE VOLTAGE WIRING SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR UNLESS NOTED OR SPECIFIED HEREIN OTHERWISE.
1.14 COMMISSIONING
1 SUPPLY INITIAL CHARGE OF REFRIGERANT AND OIL FOR EACH REFRIGERATION SYSTEM. CHARGE THE SYSTEM WITH REFRIGERANT AND TEST ENTIRE SYSTEM FOR LEAKS AFTER COMPLETION OF INSTALLATION. REPAIR LEAKS, PUT SYSTEM INTO OPERATION, AND TEST EQUIPMENT PERFORMANCE.
2 PROVIDE COOLING SEASON START-UP, WINTER SEASON SHUT-DOWN FOR FIRST YEAR OF OPERATION.
3 SUPPLY THE SERVICE OF A FACTORY TRAINED REPRESENTATIVE TO SUPERVISE TESTING, DEHYDRATION AND CHARGING OF MACHINES, START-UP AND INSTRUCTION ON OPERATION AND MAINTENANCE TO OWNER.

END OF SECTION

2.0 PRODUCTS

2.1 PIPING

- 1 REFRIGERANT PIPING:
.1 PIPE: ACR COPPER; F & J: SILVER SOLDER ON WROUGHT COPPER OR BRASS JOINTS, HIGH TEMPERATURE SILVER SOLDER ON DISCHARGE LINES.

2.2 HANGERS

- 1 EQUAL TO CRANE 55M LIGHT SPLIT HANGER WITH THREADED STEEL ROD FASTENED TO INSERTS OR BEAM CLAMPS. SPACE TO ADEQUATELY SUPPORT PIPING WITH A SERVICE FACTOR OF 5 FOR THE SERVICE INTENDED AND THE MATERIALS USED. INSTALL TO AVOID ANY SAGGING OR STRAINING OF JOINTS.
2 USE COPPER PLATED HANGERS FOR COPPER PIPE. PERFORATED HANGERS WILL NOT BE PERMITTED.
3 PROVIDE HANGERS AT EACH HORIZONTAL ELBOW, FITTING OR VALVE, AT CHANGES IN DIRECTION AND IN ACCORDANCE TO THE FOLLOWING:

Table with 4 columns: PIPE SIZE (MM), ST. WT. STEEL (M), COPPER (M), and values for 20 MM & SMALLER, 25 TO 40, 50 TO 65, 75 TO 100.

2.3 VALVES AND UNIONS

- 1 REFRIGERATION VALVES SHALL BE EQUAL TO SUPERIOR OR HENRY.

2.4 LIQUID INDICATORS

- 1 LIQUID INDICATORS SHALL BE DOUBLE PORT TYPE WITH COPPER OR BRASS BODY, AND FLARED OR SOLDER ENDS.
2 PROVIDE REMOVABLE SEAL CAPS ON EACH PORT TO INSPECT REFRIGERANT CONDITION.

2.5 FILTER DRIERS

- 1 COMBINATION FILTER DRIERS SHALL BE ANGLE TYPE, WITH BRASS SHELL AND INCORPORATE A COMBINED STRAINING AND DRYING MATERIAL.
2 DESICCANT MATERIAL SHALL BE REPLACEABLE.

2.6 SOLENOID VALVES

- 1 SOLENOID VALVES SHALL HAVE COPPER OR BRASS BODY WITH FLARED OR SCREWED ENDS.
2 COIL ASSEMBLY SHALL BE REPLACEABLE.
3 VALVES SHALL INCORPORATE A MANUALLY OPERATED STEM TO SERVE AS A BYPASS IN CASE OF COIL FAILURE.

2.7 EXPANSION VALVES

- 1 ANGLE TYPE OR STRAIGHT THROUGH EXPANSION VALVES SHALL BE SUITABLE FOR THE REFRIGERANT UTILIZED IN THE SYSTEM.
2 VALVES SHALL HAVE BRASS BODY, INTERNAL OR EXTERNAL EQUALIZER, ADJUSTABLE SUPERHEAT SETTING AND BE COMPLETE WITH CAPILLARY TUBE AND REMOTE SENSING BULB.

2.8 CHARGING VALVES

- 1 GENERAL PURPOSE TYPE REFRIGERANT CHARGING VALVES WITH BRASS BODY, FLARED OR SOLDER ENDS AND WITH REMOVABLE VALVE CORE.
2 PROVIDE VALVE INLET WITH QUICK COUPLING CONNECTION FOR EASE OF CHARGING.

2.9 FLEXIBLE CONNECTORS

- 1 FLEXIBLE CONNECTORS SHALL CONSIST OF CLOSE PITCH CORRUGATED BRONZE HOSE WITH SINGLE LAYER OF EXTERIOR BRAIDING TO PROVIDE ADDITIONAL STRENGTH AND PREVENT ELONGATION OF CORRUGATED SECTION.
2 CONNECTOR SHALL BE MINIMUM 225 MM LONG AND PROVIDED WITH BRONZE FITTING TO FACILITATE CONNECTION TO EQUIPMENT.

2.4 EQUIPMENT AND MATERIALS

- 1 PROVIDE EQUIPMENT AND MATERIALS OF TYPE SPECIFIED IN SCHEDULE OR ON THE DRAWINGS OR SUBMIT FOR APPROVED EQUAL.
2 ALL EQUIPMENT TO BE NEW, C.S.A. CERTIFIED, SUITABLE FOR THE APPLICATION INTENDED.
3 MANUFACTURERS AND SUPPLIERS OF EQUIPMENT AND MATERIALS SHALL HAVE OFFICES IN CANADA, WITH AN ACCEPTABLE OPERATING ORGANIZATION IN THE PROVINCE FOR REPLACEMENT PARTS AND SERVICE.
4 PROVIDE ALL NECESSARY SUPPORTS NOT AFFECTING STRUCTURAL AND INSTALL TO PERMIT ACCESS FOR SERVICING AND GENERAL MAINTENANCE OF COMPONENTS.
5 INSTALL ALL EQUIPMENT IN ACCORDANCE TO MANUFACTURER'S INSTRUCTIONS AND USE FACTORY TRAINED PERSONNEL FOR START-UP AND TESTING OF MAJOR EQUIPMENT.

2.5 IDENTIFICATION

- 1 IDENTIFY PIPING TO INDICATE DIRECTION OF FLOW AND SERVICE. TAG ALL VALVES AND PROVIDE IDENTIFICATION CHART. LABEL ALL EQUIPMENT AND CONTROLS TO COINCIDE WITH DRAWINGS, SCHEMATICS AND SCHEDULES. USE PREMANUFACTURED MARKERS.
2 IDENTIFY ALL EQUIPMENT WITH LAMACOID LABELS.

2.6 VIBRATION ISOLATION

- 1 PROVIDE LABOUR, MATERIALS, AND EQUIPMENT AS REQUIRED TO ISOLATE AND RESTRAIN EQUIPMENT AND PIPING FOR QUIET AND VIBRATION FREE OPERATION. CONNECT TO ISOLATED EQUIPMENT WITH FLEXIBLE CONNECTORS.

2.7 INSULATION

- 1 REFRIGERANT PIPING: 25 MM ARMAFLEX OR EQUAL WITH PVC JACKET AND LABELS INDICATING SERVICE AND DIRECTION OF FLOW.
2 EXTERIOR REFRIGERATION PIPING: 25 MM ARMAFLEX OR EQUAL WITH ALUMINUM JACKET, SILICONE JOINTS AND LABELS INDICATING SERVICE AND DIRECTION OF FLOW.
3 USE A QUALIFIED INSULATION CONTRACTOR FOR SUPPLY AND INSTALLATION.

2.0 PRODUCTS CONT'D

2.8 CONTROLS

- 1 PROVIDE A COMPLETE SYSTEM OF ELECTRIC OR ELECTRONIC AND AUTOMATIC CONTROLS AS INDICATED ON THE DRAWINGS. ENGAGE THE SERVICES OF JOHNSON CONTROLS TO INTEGRATE THE CONTROLS FOR THE NEW CONDENSING UNIT WITH THE EXISTING BUILDING AUTOMATION SYSTEM. SUBMIT DRAWINGS OF PROPOSED CONTROL EQUIPMENT AND SEQUENCES FOR REVIEW BY THE CONSULTANT.
2 PROVIDE ALL, AIR STREAM THERMOSTATS, VALVES, SWITCHES, AND OTHER AUXILIARY EQUIPMENT AS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.
3 ALL CONTROL WIRING FOR EQUIPMENT SPECIFIED UNDER MECHANICAL, SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.
4 CONTROL WIRING INCLUDING THE REQUIREMENT FOR CONDUIT SHALL BE IN ACCORDANCE WITH THE ELECTRICAL SPECIFICATIONS AND LOCAL CODES.

END OF SECTION

3.0 EXECUTION

- 3.1 INSTALL EQUIPMENT IN ACCORDANCE TO GOOD TRADE PRACTICE, MANUFACTURER'S RECOMMENDATIONS AND AS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATIONS.
3.2 MAINTAIN MAXIMUM PERMISSIBLE HEAD ROOM AND LOCATE EQUIPMENT TO PERMIT ACCESS, SERVICING AND REMOVAL OF SERVICEABLE COMPONENTS.
3.3 TEST AND START SYSTEMS IN AN ORDERLY FASHION. OBTAIN CERTIFICATES OF APPROVAL, ACCEPTANCE, AND COMPLY WITH RULES AND REGULATIONS OF AUTHORITY HAVING JURISDICTION.
3.4 PROVIDE HANGERS AND SUPPORTS TO SECURE EQUIPMENT IN PLACE. PREVENT VIBRATION, MAINTAIN GRADE, PROVIDE FOR EXPANSION AND CONTRACTION AND ACCOMMODATE INSULATION. MINIMUM FACTOR OF SAFETY SHALL BE 5.
3.5 SLEEVE AND FLASH AS REQUIRED TO MAINTAIN INTEGRITY OF FLOORS, WALLS, OR ROOF.
3.6 SET MAJOR EQUIPMENT ON CONCRETE HOUSEKEEPING PADS.
3.7 PROVIDE ISOLATION VALVES AND UNIONS AT EQUIPMENT, DRAIN VALVES AT LOW POINTS AND RELIEF VALVES ON VESSELS.
3.8 ISOLATE DISSIMILAR METALS WHERE CONNECTION CAN OCCUR.
3.9 PROVIDE VIBRATION ISOLATORS FOR MECHANICAL MOTOR DRIVEN EQUIPMENT THROUGHOUT UNLESS SPECIFIED OTHERWISE. PROVIDE FLEXIBLE CONNECTORS ON PIPING TO ISOLATED EQUIPMENT.
3.10 PROVIDE METERS, GAUGES, AND THERMOMETERS TO PERMIT OBSERVATION OF SYSTEM OPERATING CONDITIONS. LOCATE FOR EASY READING AND SELECT AT MIDPOINT OF RANGE.
3.11 PROVIDE INSULATION IN ACCORDANCE WITH GOOD TRADE PRACTICE. PERFORM WORK AT AMBIENT TEMPERATURES. ENSURE SURFACES ARE CLEAN AND DRY PRIOR TO INSTALLATION. ENSURE INSULATION IS DRY.
3.12 PROVIDE RECOVERING JACKETS ON INSULATION WHERE EXPOSED AND WEATHERPROOF INSULATION EXPOSED TO OUTDOORS. ALL OUTDOOR PIPING SHALL BE INSULATED.
3.13 IDENTIFY ALL PIPING AND EQUIPMENT. TAG VALVES AND PREPARE A VALVE LIST. USE PREMANUFACTURED MARKERS AND LAMACOID LABELS.
3.14 INSTALL PIPING TRUE TO ROUTE AND GRADE. CONNECT TO EQUIPMENT WITHOUT STRAIN ON CONNECTIONS. WELD, SOLDER, OR BRAZE PIPING IN INACCESSIBLE LOCATIONS.
3.15 PROVIDE DRIP PANS, SHIELDS, COLD AIR BARRIERS AS REQUIRED.
3.16 PROVIDE A COMPLETE SYSTEM OF AUTOMATIC CONTROLS. AT COMPLETION OF THE WORK, MAKE A DETAILED CHECK OUT AND SUBMIT A WRITTEN REPORT.
3.17 LABEL ALL CONTROLS FIELD COMPONENTS.
3.18 INSTALL CONTROLS SYSTEM AND COMPONENTS WITH FACTORY TRAINED JOURNEYMEN IN ACCORDANCE TO MANUFACTURER'S INSTRUCTIONS.
3.19 LOCATE CONTROL COMPONENTS WITH ADJUSTABLE SET POINTS FOR EASY ACCESS.

3.20 REFRIGERATION EQUIPMENT

- 1 HALOCARBONS
.1 COMPLY WITH FEDERAL HALOCARBON REGULATIONS 2003 UNDER THE CANADIAN ENVIRONMENT PROTECTION ACT 1999.
2 LIQUID INDICATORS
.1 PROVIDE FULL SIZE LIQUID INDICATOR IN MAIN LIQUID LINE LEAVING CONDENSER. IF RECEIVER IS USED, INSTALL IN LIQUID LINE LEAVING RECEIVER.
3 FILTER DRIERS
.1 FILTER DRIERS MAY BE USED IN SYSTEMS INSTEAD OF SEPARATE STRAINERS AND DRIERS.
.2 INSTALL WITH THREE VALVE BYPASS ASSEMBLY TO PERMIT ISOLATION FOR SERVICING.
4 SOLENOID VALVES
.1 PROVIDE SOLENOID VALVES IN LIQUID LINE OF SYSTEMS OPERATING WITH SINGLE PUMP-OUT OR PUMP-DOWN COMPRESSOR CONTROL. IN LIQUID LINE OF SINGLE OR MULTIPLE EVAPORATOR AND IN OIL BLEEDER LINE FROM FLOODED EVAPORATORS TO STOP FLOW OF OIL AND REFRIGERANT INTO THE SUCTION LINE WHEN SYSTEM SHUTS DOWN.
.2 PROVIDE SOLENOID VALVES WITH MANUALLY OPERATED STEMS.
5 EXPANSION VALVES
.1 SIZE EXPANSION VALVES PROPERLY TO AVOID PENALTY OF BEING UNDERSIZED AT FULL LOAD OR BEING EXCESSIVELY OVSIZED AT PARTIAL LOAD.
.2 PROPERLY EVALUATE REFRIGERANT PRESSURE DROP THROUGH SYSTEM TO DETERMINE THE AVAILABLE PRESSURE DROP ACROSS THE VALVE.
.3 SELECT VALVES FOR MAXIMUM LOAD AT DESIGN OPERATING PRESSURE AND MINIMUM 6°C OF SUPERHEAT.
.4 LOCATE REMOTE EXPANSION VALVES SENSING BULB IMMEDIATELY AFTER EVAPORATOR OUTLET ON SUCTION LINE.
.5 WHERE SCHEDULED, CAPILLARY OR PROPRIETARY EXPANSION DEVICES MAY BE USED.
6 CHARGING VALVES
.1 PROVIDE REFRIGERANT CHARGING CONNECTIONS IN LIQUID LINE BETWEEN RECEIVED SHUT-OFF VALVE AND EXPANSION VALVE.
7 COMPRESSOR CONNECTIONS
.1 IN GENERAL, INSTALL SUCTION AND HOT GAS PIPING CONNECTIONS TO COMPRESSORS WITH THREE DIRECTIONAL CHANGES FOR DISTANCE OF MINIMUM SIX PIPE DIAMETERS BEFORE REACHING POINT OF SUPPORT.
.2 FLEXIBLE CONNECTOR SHALL ONLY BE UTILIZED AT OR NEAR COMPRESSORS WHERE IT IS NOT PHYSICALLY POSSIBLE TO ABSORB VIBRATION WITHIN PIPING CONFIGURATION, OR WHERE SPECIFIED.
8 CONDENSING UNIT
.1 INSTALL IN STRICT ACCORDANCE WITH MANUFACTURERS REQUIREMENTS, SHOP DRAWINGS AND CONTRACT DOCUMENTS.
.2 MAKE REFRIGERANT, POWER AND CONTROLS CONNECTIONS.
9 EVAPORATOR COIL
.1 SUPPORT COIL SECTION ON STEEL CHANNEL ON DOUBLE ANGLE FRAMES AND SECURE TO CASINGS. ARRANGE SUPPORTS FOR COILS SO AS NOT TO PIERCE OR SHORT CIRCUIT DRIP PANS. LEVEL SERPENTINE COILS AND INSTALL DRAINABLE OR CLEANABLE TUBE COILS WITH PITCH WITHIN CASINGS. PROVIDE AIRTIGHT SEAL BETWEEN COIL AND UNIT CABINET.

3.0 EXECUTION CONT'D

3.21 REFRIGERANT PIPING

- 1 REMOVE ALL EXISTING EXPANSION VALVES AND SOLENOID VALVES AND REDUNDANT PIPING. PROVIDE ALL NEW EXPANSION VALVES AND SOLENOID VALVES.
2 INSULATE SUCTION PIPING.
3 INSTALL PIPING USING CURRENT BEST PRACTICES. PROVIDE ANY MODIFICATIONS REQUIRED BY MANUFACTURER'S START-UP TECHNICIAN.
4 PITCH ALL HORIZONTAL LINES MINIMUM 0.5% IN DIRECTION OF FLOW.
5 HORIZONTAL DIMENSIONS OF TRAPS MUST BE AS SMALL AS POSSIBLE.
6 ISOLATE REFRIGERANT PIPING FROM BUILDING, STRUCTURE AND DISSIMILAR METALS. USE UNISTRUT SYSTEM AND HYDRASORB CLAMPS.
7 ARRANGE PIPING SO THAT NORMAL INSPECTION AND SERVICE OF REFRIGERATION EQUIPMENT IS NOT HINDERED.
8 PIPING SHALL BE DEGREASED AND CLEANED ACR TYPE KOR L SEAMLESS HARD COPPER PIPING AND TUBING TO ASTM B88; BRAZE ALL JOINTS WHILE PURGING WITH INERT GAS.
9 PRESSURE TEST AND EVACUATE ALL PIPING SYSTEMS PRIOR TO REFRIGERANT CHARGING. CHECK FOR ANY LEAKS AND REPAIR.
10 PROVIDE FOR REFRIGERANT CHARGE.
11 PIPING SUPPORTS SHALL BE ARRANGED SO THEY DO NOT UNDULY RESTRAIN THE EXPANSION OR CONTRACTION OF THE PIPE.
12 PROVIDE FLASHING AND PIPING ENCLOSURE WITH HORIZONTAL PENETRATIONS FOR PIPING AND ELECTRICAL.

END OF SECTION

4.0 EQUIPMENT SCHEDULE

4.1 CONDENSING UNIT CU-2

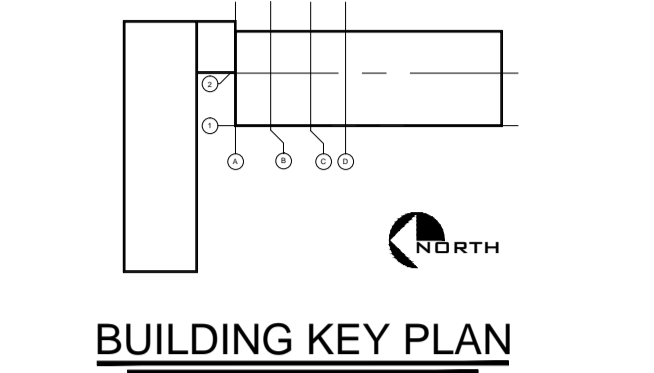
- 1 AIR COOLED SCROLL CONDENSING UNIT, R410A, 145.60 KW (496.8 MBH) CAPACITY AT 7.22 C (45 F) SUCTION TEMPERATURE, 35 C (95 F) OUTDOOR AMBIENT TEMPERATURE, c/w ULTRA QUIET FANS, COMPRESSOR ACOUSTIC SOUND BLANKET, HOT GAS-BY-PASS ON LEAD CIRCUIT, SINGLE POINT NON FUSED DISCONNECT SWITCH, FACTORY INSTALLED CONTROL TRANSFORMER, LOW AND HIGH AMBIENT KIT, SUCTION AND DISCHARGE PRESSURE READOUT KITS, SERVICE ISOLATION VALVES, COMPRESSOR CRANK CASE HEATERS, POWER FACTOR CORRECTION CAPACITORS, MOTOR CURRENT MODULE, LOUVERED FULL UNIT ENCLOSURE PANELS, AND ELASTOMERIC VIBRATION ISOLATORS. UNIT SHALL BE SUITABLE FOR DIRECT INTEGRATION INTO JOHNSON CONTROLS DDC. 575/3/60, 80.2 MCA, 45.4 TOTAL UNIT KW, 10.93 TOTAL UNIT EER.
2 START-UP BY FACTORY TRAINED TECHNICIAN.
3 SOUND DATA (95F AMBIENT, 100% LOAD)
63Hz 125 250 500 1K 2K 4K 8K dBA
68.0 62.0 61.0 59.0 56.0 51.0 48.0 46.0 61.0
4 ACCEPTABLE MANUFACTURERS: DAIKIN, TRANE, YORK/JCI. BIDDERS SHALL PROVIDE SUBMITTAL DATA FOR PROPOSED EQUIPMENT TO CONSULTANT FOR REVIEW A MINIMUM OF 5 DAYS PRIOR TO TENDER CLOSE.

4.2 DX COOLING COIL CC-2

- 1 DX COOLING COIL, 2,794mm x 914mm (110" X 36") FACE AREA, R410A, 5 ROW, 12 FPI, 142.6 KW (486.5 MBH) TOTAL COOLING CAPACITY, 105.4 KW (359.8 MBH) SENSIBLE CAPACITY, WITH 6,371 LPS (13,500 CFM) AT 26.7/18.3 C (80/65 F) DB/WB EAT, 12.0/11.2 C (53.6/52.2 F) DB/WB LAT, 174 Pa (0.7 INCH) APD, 7.2 C (45 F) EVAPORATING TEMPERATURE. CONTRACTOR TO FIELD CONFIRM COIL DIMENSIONS TO FIT EXISTING AIR HANDLING UNIT PRIOR TO ORDERING COIL.
2 ACCEPTABLE MANUFACTURERS: DAIKIN, TRANE, YORK/JCI. COIL SHALL BE OF SAME MANUFACTURER AS CONDENSING UNIT CU-2.

4.3 GUARDRAIL

- 1 KWIK KIT STRAIGHT STEEL SAFETY RAILING, 3 PRE-ASSEMBLED 1067mm (42") UPRIGHTS, 4 HORIZONTAL RAILS, COMPLETE WITH ALL REQUIRED STANDARD RAILING BASE FLANGES AND FITTINGS, 3658mm (144") LONG, 1067mm (42") HIGH, 1829mm (72") POST SPACING, SAFETY YELLOW, MANUFACTURED BY KEE SAFETY, WEBSITE: HTTP://SIMPLIFIEDSAFETY.COM/STORE/FALL-PROTECTION/PASSIVE/QUICK-INSTALL-RAILINGS/KWIK-KIT-STRAIGHT-STEEL.HTML

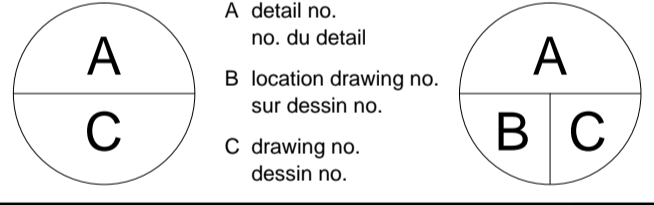


PROFESSIONAL ENGINEER / ASSOCIATION OF PROFESSIONAL ENGINEERS OF SASKATCHEWAN / CERTIFICATE OF AUTHORIZATION / KEY WEST ENGINEERING LTD. / NUMBER 2939 / DISCIPLINE MECHANICAL / 2939

KEY WEST ENGINEERING LTD. / 477 - 1ST AVENUE NORTH / SASKATOON, SASKATCHEWAN CANADA / S7K-1X5 / PH: (306) 652-7772 / FX: (306) 664-1906 / E-MAIL: keywest.eng@shaw.ca

Table with 3 columns: REV, Description, Date. Includes entries for RE-IFT - ADDED GUARDRAIL (04-MAR-2016), RE-ISSUED FOR TENDER (02-FEB-2016), and ISSUED FOR TENDER (16-JAN-2016).

Table with 3 columns: REV, Description, Date. Includes entries for A detail no. du detail, B location drawing no. sur dessin no., and C drawing no. dessin no.



AIR COOLED CONDENSING UNIT REPLACEMENT / ENVIRONMENT CANADA / 115 Perimeter Rd. / Saskatoon SK. S7N 0X4

SPECIFICATIONS AND EQUIPMENT SCHEDULE

Table with 2 columns: Field (Designed By, Date, Drawn By, Reviewed By, Approved By, Date, Tender, Project Manager, EC PMDI Proj. no., Drawing no.) and Value (KEY WEST ENGINEERING LTD, 2015/12/16, LDR, 2015/12/16, RJC, 2015/12/16, IFT, N.Fehr, Administreur de projets, PNWRC-004, 691-161, No. du dessin).

M2

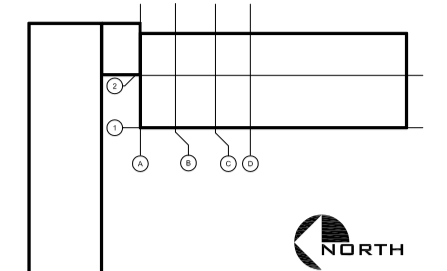
Plotted by: Robert F Cowan Mar 04, 2016 - 10:14am

**ELECTRICAL SPECIFICATIONS**

1. PERMITS, FEES AND BUILDING CODES
  - .1 OBTAIN THE REQUIRED PERMITS FROM SASK. POWER INSPECTIONS PRIOR TO THE START OF WORK. PAY ALL ASSOCIATED FEES FOR SAME.
  - .2 THE MATERIALS AND INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF THE 2012 EDITION OF THE CANADIAN ELECTRICAL CODE AND PROVINCIAL SUPPLEMENTS. IN CASE OF A CONFLICT BETWEEN THE CODE AND THE CONTRACT DOCUMENTS, A WRITTEN RULING FROM THE ENGINEER TO BE REQUESTED. IN NO INSTANCE, HOWEVER, SHALL THE STANDARD ESTABLISHED BY THE DRAWINGS AND THE SPECIFICATIONS BE REDUCED BY ANY CODES.
  - .3 THE ELECTRICAL INSTALLATION AND MATERIALS SHALL ALSO COPY WITH THE NATIONAL BUILDING CODE VERSION 2010.
3. EXCAVATION AND BACK FILL
  - .1 ALL EXCAVATION AND BACK FILLING ASSOCIATED WITH THE ELECTRICAL WORK SHALL BE PART OF DIV. 16, ELECTRICAL.
  - .2 CONFIRM THE LOCATION OF ALL UNDERGROUND SERVICES PRIOR TO TRENCHING.
  - .3 TRENCH TO THE REQUIRED DEPTH AND WIDTH. ALL ELECTRICAL CONDUITS TO BE MINIMUM 100MM BELOW FINISHED GRADE UNLESS OTHERWISE INDICATED.
  - .4 BEFORE BACK FILLING, OBTAIN APPROVAL FROM THE ENGINEER. E-MAILED PHOTOS MAY BE ACCEPTED.
  - .5 NO WATER TO BE USED FOR COMPACTION DURING BACK FILLING OPERATIONS.
4. PROTECTION
  - .1 BE RESPONSIBLE FOR AND MAKE GOOD ANY DAMAGE CAUSED DIRECTLY OR INDIRECTLY TO ANY WALLS, FLOORS, CEILINGS, WOODWORK AND OTHER FINISHED SURFACES.
  - .2 PROTECT ALL ELECTRICAL WORK FROM DAMAGE. ALL ELECTRICAL EQUIPMENT TO BE KEPT DRY AND CLEAN AT ALL TIMES.
  - .3 NO ELECTRICAL PANELS SHALL BE LEFT IN THE OPEN POSITION.
5. CUTTING AND PATCHING
  - .1 PAY FOR ALL CUTTING AND PATCHING REQUIRED FOR THE INSTALLATION OF ELECTRICAL EQUIPMENT.
  - .2 EMPLOY THE SERVICES OF QUALIFIED AND SKILLED TRADESMEN TO PERFORM ALL CUTTING AND PATCHING.
6. MATERIALS AND EQUIPMENT
  - .1 ALL ELECTRICAL EQUIPMENT AND MATERIALS SHALL BE APPROVED BY CSA OR OTHER INSPECTION AUTHORITIES WHICH ARE RECOGNIZED IN THE PROVINCE OF SASK.
  - .2 WHERE SPECIFIC TRADE DESIGNATIONS ARE NOT USED IN THE SPECIFICATIONS FOR MATERIALS OR EQUIPMENT, SPECIFICATION GRADE SHALL BE USED.
  - .3 WHERE CABLES OR CONDUITS PASS THROUGH FIRE RATED ASSEMBLIES, THE SPACE BETWEEN SUCH CABLES AND THE ASSEMBLIES SHALL BE PACKED WITH A COMPOUND MANUFACTURED FOR THE APPLICATION.
7. WORKMANSHIP
  - .1 ALL WORK SHALL BE CARRIED OUT NEATLY AND IN A WORKMANLIKE MANNER, TO THE SATISFACTION OF THE CONSULTANT AND OWNER'S REPRESENTATIVE. ANY UNSATISFACTORY WORKMANSHIP SHALL BE RECTIFIED WITHOUT ANY ADDITIONAL COST TO THE OWNER.
8. GROUNDING AND BONDING
  - .1 SUPPLY AND INSTALL ALL GROUNDING TO CONFORM WITH THE 2012 EDITION OF THE CANADIAN ELECTRICAL CODE - "GROUNDING AND BONDING".
9. CONDUIT AND CABLE
  - .1 ALL WIRING (LINE & LOW VOLTAGE) ON THIS PROJECT SHALL BE IN CONDUIT OR ARMoured TECK CABLE.
  - .2 WHERE CONDUIT IS USED, EMT SHALL BE USED INSIDE THE BUILDING; RIGID PVC TO BE USED FOR OUTSIDE OR ANY UNDERGROUND WORK.
10. VAPOUR BARRIER PENETRATIONS
  - .1 CONDUITS & CABLES WHICH PENETRATE A VAPOUR BARRIER SHALL BE SEALED A PRODUCT MANUFACTURED FOR THE APPLICATION.
11. ALLOWANCE FOR SPARE CIRCUITS
  - .1 ALLOW FOR AN ADDITIONAL 4 SPARE CIRCUITS, EACH 20 M LONG, 3#12+G-0.5" COND.
  - .2 FOR PURPOSES OF CONTRACT PRICE ADJUSTMENT FOR SPARE CIRCUITS, A CREDIT OF \$425.00 PER CIRCUIT WOULD APPLY IF THESE ARE NOT USED.
  - .3 FURTHER INFORMATION ON THE ABOVE SPARE CIRCUITS TO BE DETERMINED DURING THE CONSTRUCTION PHASE.
12. CONDUIT INSTALLATION
  - .1 PULL BOXES, OUTLET BOXES OR JUNCTION BOXES SHALL BE INSTALLED IN ALL CONDUIT RUNS, ON THE BASIS OF NOT MORE THAN THREE RIGHT ANGLE BENDS OR THEIR EQUIVALENT OR A DISTANCE NOT TO EXCEED 30 METERS BETWEEN BOXES.
  - .2 WHERE LOCK NUTS AND BUSHINGS ARE USED, THEY SHALL BE TIGHTENED TO ENSURE A PERFECT MECHANICAL AND ELECTRICAL BOND. ERIKSON COUPLINGS SHALL BE USED IN LIEU OF RUNNING THREAD. DIE-CAST SCREW TYPE TYPE FITTINGS AS MANUFACTURED BY T & B, OR EQUAL, SHALL BE USED WITH EMT.
  - .3 NYLON INSULATED BUSHINGS SHALL BE USED ON THE ENDS OF ALL CONDUIT IN OUTLET BOXES, JUNCTION BOXES, PULL BOXES, PANELS, ETC. TO PROTECT THE CONDUCTOR INSULATION DURING INSTALLATION.
  - .4 USE AN APPROVED LUBRICANT TO ASSIST IN PULLING CONDUCTORS.
  - .5 CONDUITS SHALL BE SECURED WITH CONDUIT FASTENERS AT CODE INTERVALS BASED ON THE SIZE OF CONDUITS. MULTIPLE RUNS OF CONDUITS SHALL BE SUPPORTED ON UNISTRUT CHANNELS SUSPENDED FROM, OR FASTENED TO, THE STRUCTURE.
  - .6 FIELD BENDS AND OFFSETS SHALL BE UNIFORM AND SYMMETRICAL WITHOUT FLATTENING CONDUIT. THE MINIMUM BENDING RADIUS SHALL NOT BE LESS THAN TEN TIMES THE CONDUIT DIAMETER.
13. RECORD DRAWINGS
  - .1 OBTAIN TWO SETS OF BUILDING DRAWINGS FOR USE AS AS BUILTS; ONE SET TO BE USED AS A DRAFT SET; THE OTHER SET TO BE NEATLY MARKED UP FOR AS BUILT PURPOSES. RECORD CHANGES AND CRITICAL SITE INFORMATION THROUGHOUT THE CONSTRUCTION PERIOD.
  - .2 INFORMATION TO BE SHOWN TO INCLUDE, BUT NOT BE LIMITED, TO THE FOLLOWING: (A) LOCATION FROM A KNOWN REFERENCE POINT & DEPTH OF ALL UNDERGROUND ELECTRICAL LINES.
14. SITE VISIT
  - .1 THIS CONTRACTOR SHALL MAKE A SITE VISIT DURING THE TENDER PHASE TO VIEW ALL EXISTING CONDITIONS THAT WILL AFFECT HIS WORK. THESE CONDITIONS SHALL BE TAKEN INTO CONSIDERATION IN THE TENDER PRICE.

**GENERAL NOTES**

1. SCOPE OF ELECTRICAL WORK:
  - .1 REMOVE CONDUIT & WIRING TO EXISTING ROOF TOP CONDENSING UNIT.
  - .2 PROVIDE NEW POWER WIRING FOR A NEW 80.5 MCA, 575/3 CONDENSING UNIT. THE WIRING TO BE 3#3+G PVC JACKETED TECK CABLE. WIRE TO EXISTING 100A3P BREAKER IN PANEL 'H'. PROVIDE A LAMACOID CIRCUIT NUMBER LABEL ON THE NEW CONDENSING UNIT AT THE POWER PANEL. THE 100A3P LOCAL DISCONNECT SWITCH IS SUPPLIED WITH THE UNIT.
  - .3 ANY OBSOLETE ELECTRICAL WIRING & EQUIPMENT TO BE REMOVED FROM SITE.
2. GENERAL ROUTE FOR NEW ELECTRICAL SERVICE TO CONDENSING UNIT #2. EXIT THE BUILDING AT THE SAME LOCATION AS THE MECHANICAL PIPING.



**BUILDING KEY PLAN**

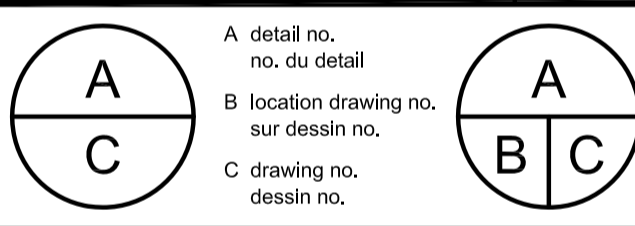


ASSOCIATION OF PROFESSIONAL ENGINEERS OF SASKATCHEWAN  
CERTIFICATE OF AUTHORIZATION  
HALL ENGINEERING CO. LTD.  
NUMBER 2  
PERMISSION TO CONSULT HELD BY:  
DISCIPLINE SASK. REG. No. SIGNATURE  
ELECTRICAL 2797 W.D. Hall

HALL ENGINEERING LTD.  
CONSULTING ELECTRICAL ENGINEER  
415 - 33RD STREET WEST  
SASKATOON, SASK. S7N 0Y2  
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| 1   | RE-ISSUED FOR TENDER | 02-FEB-2016 |
|-----|----------------------|-------------|
| 0   | ISSUED FOR TENDER    | 16-JAN-2016 |
| REV | Description          | Date        |



project \_\_\_\_\_ projet \_\_\_\_\_

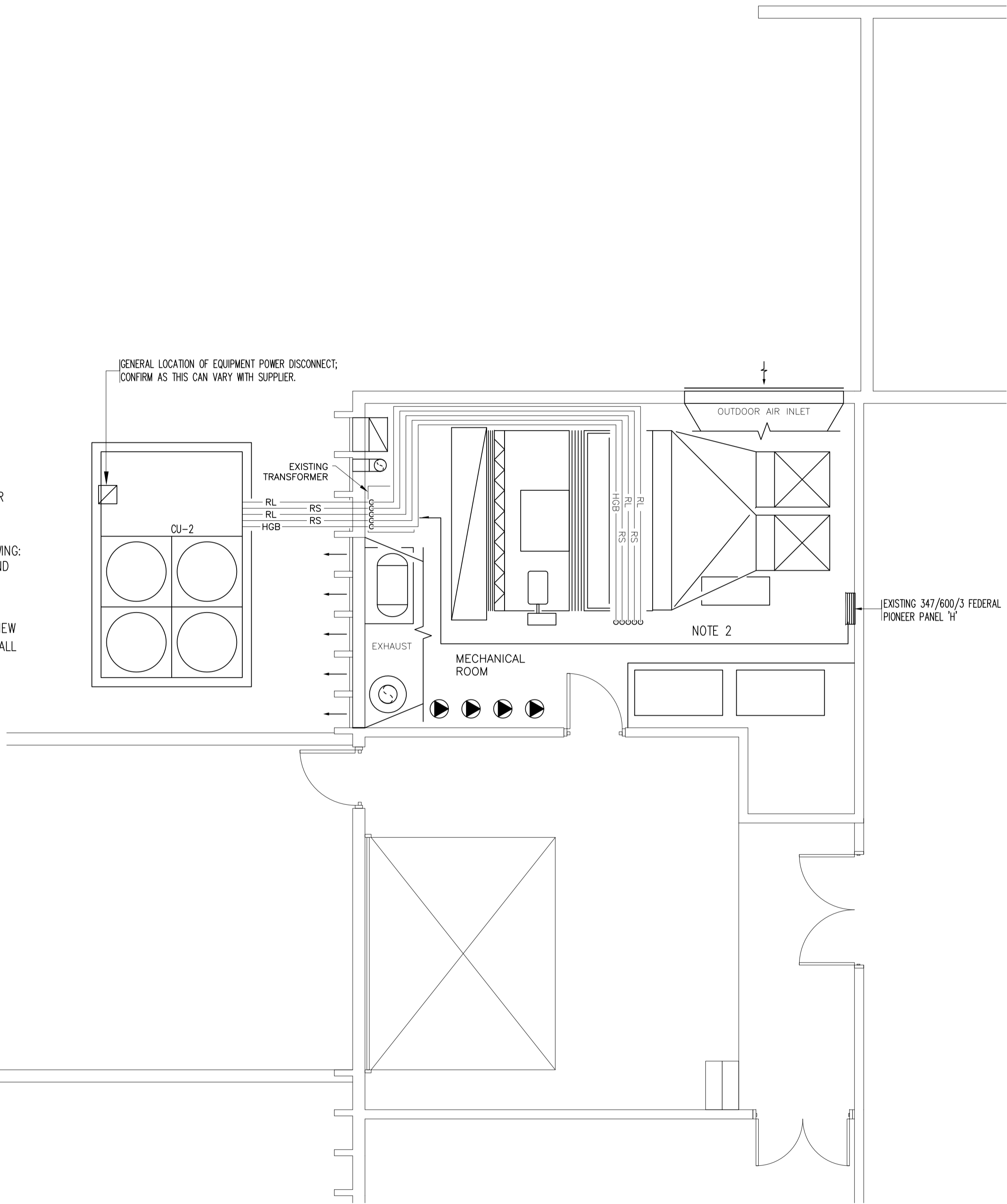
**CONDENSING UNIT REPLACEMENT**  
ENVIRONMENT CANADA  
115 Perimeter Rd.  
Saskatoon SK. S7N 0X4

drawing \_\_\_\_\_ dessin \_\_\_\_\_

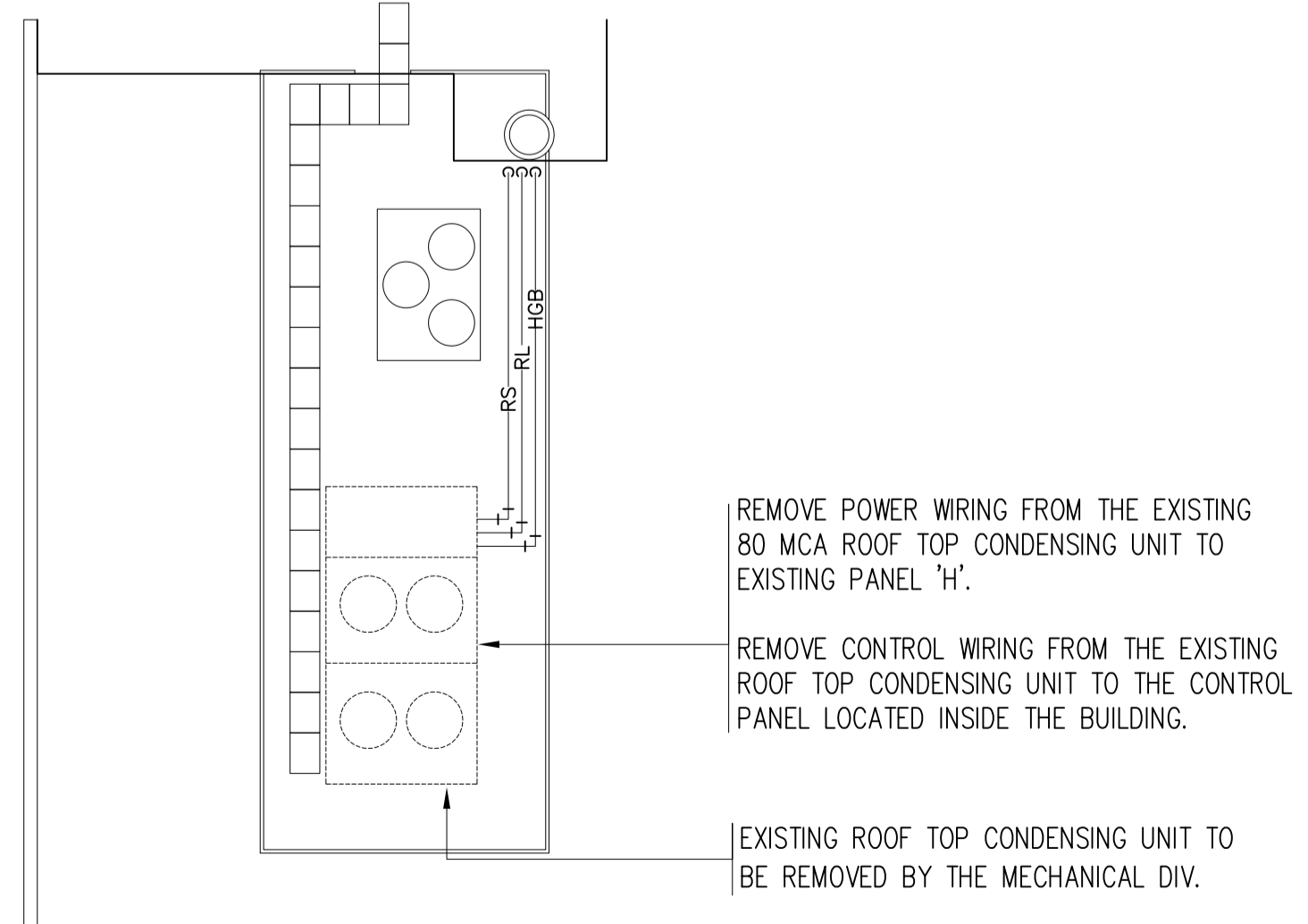
**ELECTRICAL LAYOUT**

|                  |                       |                           |                           |
|------------------|-----------------------|---------------------------|---------------------------|
| Designed By      | HALL ENGINEERING LTD. | Conçu par                 | Conçu par                 |
| Date             | 2015/12/16            | (yyyy/mm/dd)              | (yyyy/mm/dd)              |
| Drawn By         | CAL                   | Dessiné par               | Dessiné par               |
| Date             | 2015/12/16            | (yyyy/mm/dd)              | (yyyy/mm/dd)              |
| Reviewed By      | WDH                   | Examiné par               | Examiné par               |
| Date             | 2015/12/16            | (yyyy/mm/dd)              | (yyyy/mm/dd)              |
| Approved By      | WDH                   | Approuvé par              | Approuvé par              |
| Date             | 2015/12/16            | (yyyy/mm/dd)              | (yyyy/mm/dd)              |
| Tender           | IFT                   | Soumission                | Soumission                |
|                  | N. Fehr               |                           |                           |
| Project Manager  |                       | Administrateur de projets | Administrateur de projets |
| EC PMDI Proj no. |                       | Consultant Proj no.       | Consultant Proj no.       |
| <b>PNWRC-004</b> |                       | <b>1513</b>               | <b>1513</b>               |
| Drawing no.      |                       | No. du dessin             | No. du dessin             |

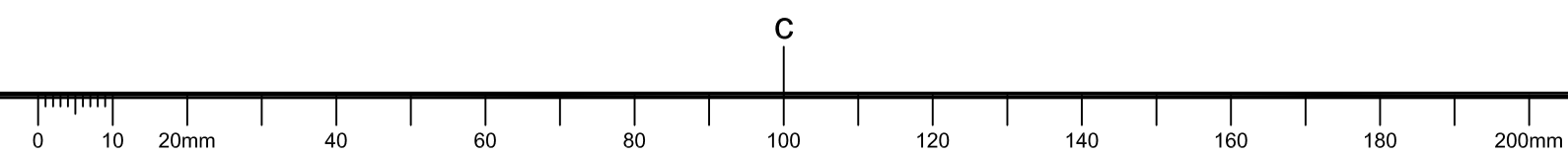
**E1**

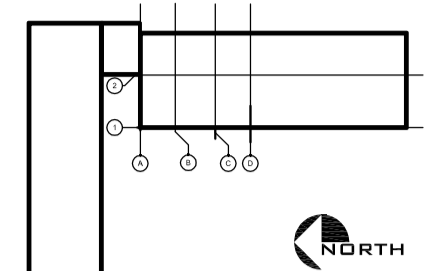


**MECHANICAL ROOM PLAN**  
SCALE: 1:50



**PARTIAL ROOF PLAN - DEMOLITION**  
SCALE: 1:100





BUILDING KEY PLAN

SPECIFICATION

GENERAL

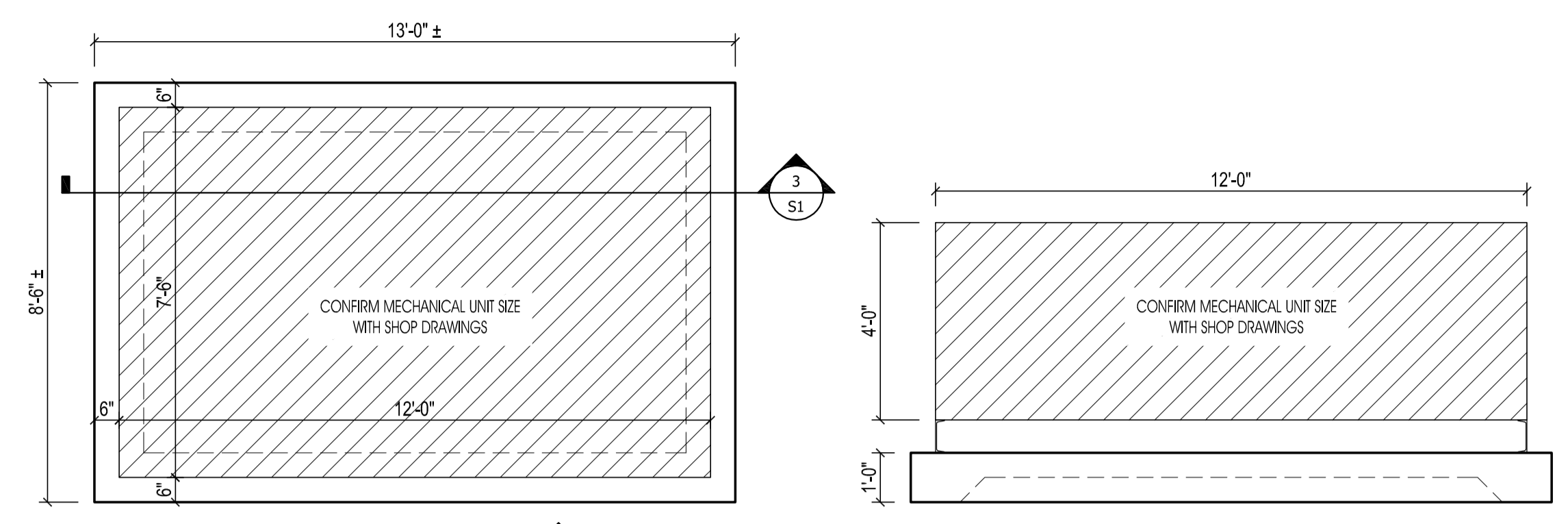
1. Protect and safeguard existing buildings and services which may be affected by this work. Report any unforeseen conditions to the owner before proceeding.
2. All dimensions to existing to be verified on site.
3. The contractor shall determine the exact location of all existing utilities before commencing work, and agrees to be fully responsible for any and all damages which might be occasioned by the contractor's failure to exactly locate and preserve any and all underground utilities.
4. Excavate to remove top soil and organics and as required for granular fill materials.

REINFORCING STEEL

1. All reinforcing steel to be deformed bars of new billet steel conforming to CSA Standard G30.12-M92 Grade 400. 10M bars and stirrups may be Grade 300.
2. Place reinforcement in accordance with the plans and the requirements of the National Building Code with the following cover on reinforcing:  
- concrete deposited directly against soil 3"

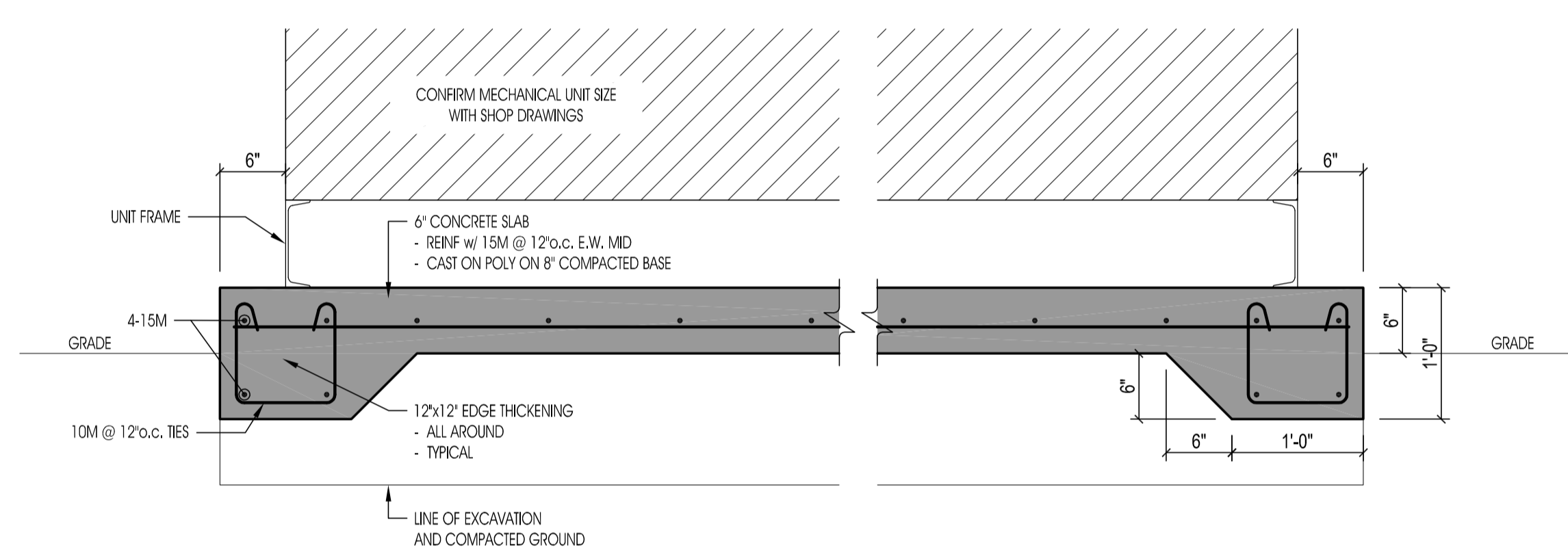
CONCRETE

1. Placing curing and finish of all concrete to be in accordance with CAN3-A23.1-09.
2. Provide concrete mixed in accordance with the requirements of CSA CAN3-A23.1-09 to meet the following specifications:  
F<sub>c</sub> = 32 MPa, Cement type IS, Maximum Aggregate Size = 3/4"  
Slump = 2" to 4", Air Entrainment = 5 to 7% for all exterior concrete
3. When outside air temperature drops below +5 degrees C or can reasonably be expected to do so, provide effective means of keeping all concrete temperatures above +10 degrees C for at least 3 days.



1 PLAN  
SCALE: 3/8" = 1'-0"

2 SIDE VIEW  
SCALE: 3/8" = 1'-0"



3 CROSS SECTION  
SCALE: 1" = 1'-0"

Professional Engineer  
D.A. HECHT  
MEMBER 12250  
16-01-12  
SASKATCHEWAN

ASSOCIATION OF PROFESSIONAL ENGINEERS & GEOSCIENTISTS OF SASKATCHEWAN  
CERTIFICATE OF AUTHORIZATION  
NUMBER C1422

PERMISSION TO CONSULT HELD BY:  
DISCIPLINE: STRUCTURAL  
SASK. REG. NO.: 0364  
SIGNATURE: [Signature]

**ROBB KULLMAN ENGINEERING LLP**  
STRUCTURAL CONSULTANTS

3022 LOUISE STREET  
SASKATOON, SASKATCHEWAN S7J 3L8  
T: 306.477.0655 F: 306.477.1995  
E: rk-eng@robb-kullman.com

| REV | Description          | Date        |
|-----|----------------------|-------------|
| 1   | RE-ISSUED FOR TENDER | 25-JAN-2016 |
| 0   | ISSUED FOR TENDER    | 16-JAN-2016 |

A detail no. no. du detail  
B location drawing no. sur dessin no.  
C drawing no. dessin no.

project projet

**AIR COOLED CONDENSING UNIT REPLACEMENT**  
ENVIRONMENT CANADA  
115 Perimeter Rd.  
Saskatoon SK. S7N 0X4

drawing dessin

**STRUCTURAL**

|  |  |
|--|--|
| Designed By<br>DH<br>Date<br>2015/12/16          | Conçu par<br>(yyyy/mm/dd)                                  |
| Drawn By<br>KP<br>Date<br>2015/12/16             | Dessiné par<br>(yyyy/mm/dd)                                |
| Reviewed By<br>DH<br>Date<br>2016/01/25          | Examiné par<br>(yyyy/mm/dd)                                |
| Approved By<br>DH<br>Date<br>2016/01/25          | Approuvé par<br>(yyyy/mm/dd)                               |
| Tender<br>IFT<br>N. Fehr                         | Soumission   |
| Project Manager<br>EC PMDI Proj no.<br>PNWRC-004 | Administrateur de projets<br>Consultant Proj no.<br>15-456 |
| Drawing no.<br>S1                                | No. du dessin  |

