SPECIFICATIONS

GENERAL NOTES:

1. THESE NOTES ARE APPLICABLE TO ALL MECHANICAL DRAWINGS INCLUDED IN THIS SET AND ALL SPECIFICATIONS INCLUDED IN THE TENDER DOCUMENTS. ANY CONTRADICTION BETWEEN SPECIFICATIONS ARE TO BE HIGHLIGHTED TO THE CONSULTANT PRIOR TO BID SUBMISSION FOR CLARIFICATION.
2. DRAWINGS SHALL NOT BE SCALED.
3. ALL DIMENSIONS IN MILLIMETERS U.N.O.
4. THE CONTRACTOR SHALL PROVIDE ALL LABOUR, NEW MATERIALS AND EQUIPMENT REQUIRED TO COMPLETE THE WORK AS DESCRIBED. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR ALL INSTALLATIONS.
5. ACCESS TO THE SITE SHALL BE CO-ORDINATED WITH THE OWNER.
6. MAINTAIN INSURANCE TO PROTECT OWNER, CONSULTANT, AND SELF TO LIMITS SET BY OWNER.
7. ASBESTOS ABATEMENT REQUIRED FOR PIPING, DUCTWORK, AND HVAC EQUIPMENT THAT IS TO BE MODIFIED OR REMOVED PRIOR TO CONDUCTING RETROFIT WORK. REFER TO PRAIRIE & NORTHERN WILDLIFE RESEARCH CENTRE HAZARDOUS MATERIALS SURVEY DATED AUGUST 28, 2014 FOR ASBESTOS CONTAINING ITEMS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FOR REQUIRED WORK AND PAY ALL FEES.
9. WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST VERSIONS OF THE NATIONAL BUILDING CODE OF CANADA, THE NATIONAL PLUMBING CODE OF CANADA, ASHRAE, SMACNA, NFPA REGULATIONS, THE NATIONAL FIRE CODE, NATIONAL ELECTRICAL SAFETY CODE, THE NATURAL GAS AND PROPANE INSTALLATION CODE CAN/CSA B149.1, BUILDING STANDARDS FOR ACCESSIBILITY, AND LOCAL AUTHORITY HAVING JURISDICTION.
10. DRAWINGS ARE DIAGRAMMATIC ONLY AND MAY NOT SHOW ALL DETAILS INVOLVING ACCURATE MEASUREMENTS OF THE BUILDING, STRUCTURAL STEEL, WALL LOCATIONS, ETC. FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO PROCEEDING WITH WORK.
11. REVIEW EQUIPMENT LOCATIONS WITH OWNER PRIOR TO INSTALLATION.
12. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE WHICH DIVISION OR SECTION PROVIDES VARIOUS PRODUCTS AND WORK. COMPENSATION WILL NOT BE CONSIDERED DUE TO DIFFERENCES IN INTERPRETATION OF TECHNICAL PROVISIONS.
13. EXAMINE THE SITE AND LOCAL CONDITIONS WHICH MAY AFFECT THE WORK OF THIS CONTRACT. EXAMINE ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS AND CONDITIONS TO ENSURE THE WORK CAN BE PERFORMED WITHOUT CHANGES AS SHOWN ON THE CONTRACT DRAWINGS. ALLOWANCE(S) WILL NOT BE MADE FOR CHANGES UNLESS IT HAS BEEN BROUGHT TO THE ENGINEER'S ATTENTION PRIOR TO TENDER CLOSING.
14. THE CONTRACTOR SHALL KEEP AN ON-GOING SET OF "AS-BUILT" DRAWINGS ON SITE. DRAWINGS ARE TO BE TURNED OVER UPON COMPLETION OF THE PROJECT.
15. SUBMIT SHOP DRAWINGS FOR ALL NEW EQUIPMENT AND COMPONENTS TO CONSULTANT FOR REVIEW AND ACCEPTANCE BEFORE EQUIPMENT OR COMPONENTS ARE ORDERED, PURCHASED, OR FABRICATED.
16. WORK SHALL BE EXECUTED BY WORKERS LICENSED AND EXPERIENCED IN THE RESPECTIVE DUTIES FOR WHICH THEY ARE EMPLOYED.
17. DISCREPANCIES OR IRREGULARITIES IN THE WORK OR DEFECTS OR DAMAGES TO THE EQUIPMENT ATTRIBUTABLE TO FAULTY OR INCORRECT INSTALLATION SHALL BE RECTIFIED BY THE CONTRACTOR AT THEIR OWN EXPENSE.
18. ENSURE ALL CLEARANCES REQUIRED BY MANUFACTURER'S INSTRUCTIONS AND APPLICABLE CODES ARE MAINTAINED.
19. PROVIDE ALL ROOF, WALL OR FLOOR PENETRATIONS REQUIRED TO COMPLETE THE WORK AS SHOWN. PATCH AND SEAL AROUND ALL OPENINGS AND FINISH TO MATCH ADJACENT SURFACES.
20. ALL MECHANICAL EQUIPMENT SHALL BE AFFIXED WITH WATERPROOF LAMACOID IDENTIFIERS OR PLAQUES DISPLAYING THE TAG DESIGNATION INDICATED IN THE EQUIPMENT SCHEDULE(S).
21. CO-ORDINATE WORK TO MINIMIZE INTERFERENCE OR DISRUPTION TO OWNER'S OPERATIONS.
22. PROVIDE FIRESTOPPING MATERIALS, COMPOUNDS, DAMPERS, AND SMOKE SEALS WHERE REQUIRED TO MAINTAIN THE INTEGRITY OF ALL FIRE SEPARATIONS.
23. THE GENERAL CONTRACTOR MUST ENSURE THE ELECTRICAL TRADE RECEIVES A FULL SET OF MECHANICAL DRAWINGS AND SPECIFICATIONS. MECHANICAL DRAWINGS SHALL GOVERN THE EXACT LOCATION OF MECHANICAL EQUIPMENT, FIXTURES, AND DEVICES IN THE EVENT OF A DISCREPANCY. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO CONNECT EACH MECHANICAL COMPONENT, VALVE, OR DEVICE REQUIRING ELECTRICAL AND/OR CONTROL WIRING AS REQUIRED, UNLESS NOTED OTHERWISE.
24. ALL MECHANICAL EQUIPMENT INSTALLATION LOCATIONS SHALL BE APPROXIMATELY WHERE INDICATED, AND ADJUSTED AS REQUIRED TO PERMIT FULL MAINTENANCE ACCESS OF NEW EQUIPMENT IN THE AREA(s) OF WORK.
25. ALL MECHANICAL EQUIPMENT, ITEMS, PIPING, ETC. SHALL BE INSTALLED TO MAINTAIN REQUIRED CLEARANCE(s) FROM ALL NEW ELECTRICAL EQUIPMENT.
26. UPON COMPLETION OF WORK, CONTRACTOR TO PROVIDE 2 BOUND AND COMPLETE O&M MANUALS INCLUDING ALL INSTALLED EQUIPMENT, WARRANTY CERTIFICATES, AND TESTING REPORTS. INCLUDE A FULL ELECTRONIC COPY OF ALL DOCUMENTS ON A FLASH DRIVE. SUBMIT TO ENGINEER FOR REVIEW. REFER TO SPECIFICATIONS FOR ALL SUBMITTAL REQUIREMENTS.

INSPECTION/TESTING:

1. WORK SHALL NOT BE INSULATED OR CONCEALED PRIOR TO BEING TESTED OR APPROVED.
2. PROVIDE, OR MAKE PROVISIONS FOR, COMPLETE TESTING AND COMMISSIONING SERVICES OF ALL MAJOR EQUIPMENT. PROVIDE SIGN-OFF DOCUMENTATION STATING EQUIPMENT HAS BEEN FULLY COMMISSIONED. PAY ALL FEES REQUIRED FOR TESTING OF EQUIPMENT OR SERVICES TO THE AUTHORITY HAVING JURISDICTION.
3. NOTIFY ENGINEER WHEN MECHANICAL SERVICES HAVE BEEN ROUGHED-IN BEFORE PROCEEDING FURTHER. SERVICES WHICH BECOME CONCEALED, BURIED OR EMBEDDED IN WALLS, SLABS OR EARTH BEFORE INSPECTION MAY RESULT IN EXTENSIVE REMOVAL OR DEMOLITION WORK TO PERMIT FULL ACCESS OR VISIBILITY AT NO ADDITIONAL COSTS TO THE OWNER.

CONTROLS:

1. DESIGN, SUPPLY AND INSTALLATION OF ALL CONTROLS IS TO BE BY JOHNSON CONTROLS AND MUST COMMUNICATE WITH EXISTING BUILDING MANAGEMENT SYSTEM (METASYS).

GAS PIPING NOTES:

1. GAS PIPING AND VENTING INSTALLATION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE NATURAL GAS AND PROPANE INSTALLATION CODE CAN/CSA B149.1, AS AMENDED.
2. ALL NEW GAS PIPING SHALL BE SCHEDULE 40 STEEL PIPE. NPS 12mm (1/2") TO 50mm (2") TO BE SCREWED ENDS, NPS 2 1/2" AND GREATER TO BE WELDED. VALVES SHALL BE GAS INSTALLATION CODE APPROVED BALL VALVES. PROVIDE SUPPORTS AND INSTALL ACCORDING TO THE NATURAL GAS AND PROPANE INSTALLATION CODE. PIPING TO BE PAINTED YELLOW.
3. PROVIDE SUPPORTS FOR ALL EXTERIOR GAS PIPING ACCORDING TO THE GAS INSTALLATION CODE TABLE 5.6.3 (SPACING OF SUPPORTS FOR PIPING) AND ACCORDING TO SECTION 5.16.3 (PROTECTION & BRACING OF PIPING OR TUBING.) ENSURE GAS PIPING PASSING THROUGH EXTERIOR WALL OF BUILDING CONFORMS TO SECTION 5.16.7 (SEAL WATERTIGHT, PIPING TO BE SLEEVED, COATED OR DOUBLE WRAPPED).
4. ALL INSTALLATIONS FOR USE WITH NATURAL GAS TO BE PERFORMED BY A QUALIFIED INSTALLER. ENSURE PROPER JOINT COMPOUNDS ARE USED FOR PIPE CONNECTIONS, AIR IS PURGED FROM LINES, AND LEAKAGE TESTING IS PERFORMED. ENSURE PROPER CONNECTIONS TO NATURAL GAS SUPPLY SYSTEM.
5. ADJUST DELIVERY PRESSURE AT ALL EQUIPMENT TO CONFORM TO MANUFACTURER'S REQUIRED DELIVERY PRESSURE. INSTALL APPROVED PRESSURE REGULATION DEVICES FOR THIS PURPOSE.
6. PERFORM ALL TESTING AND SUBMIT APPLICATIONS AND/OR DOCUMENTATION TO THE REQUIREMENT
7. GAS METERS SHALL BE INSTALLED AS INDICATED ON BOILERS B-3 AND B-4 AS WELL AS ON GAS LINE FOR HUMIDIFIERS AND HOT WATER TANK. UNIT SHALL BE IN LINE THERMAL MASS FLOW METER.

   ACCEPTABLE PRODUCT: ONICON F-5500 SERIES IN-LINE W/ BACnet COMMUNICATION.

PLUMBING NOTES:

1. FIXTURES, PIPING AND VENTING SHOWN IN APPROXIMATE LOCATIONS ONLY. ACTUAL LOCATIONS MAY DIFFER DUE TO SITE CONDITIONS. CONTRACTOR TO FIELD VERIFY ALL PIPING AND FIXTURE LOCATIONS, AND COORDINATE WITH ARCHITECTURAL PLANS PRIOR TO FABRICATION OR PERFORMING WORK AND REPORT ANY DISCREPANCIES.
2. ALL DOMESTIC WATER PIPING MATERIALS AND INSTALLATION SHALL CONFORM TO THE NATIONAL BUILDING CODE PART 7 AND TO LOCAL STANDARDS OF THE LOCAL PLUMBING AUTHORITY.
3. PATCH AND REPAIR ALL FLOOR AND WALL PENETRATIONS. FINISH TO MATCH EXISTING.
4. INSTALL ISOLATION BALL VALVES ON DCW AND DHW LINES TO ALL NEW FIXTURES.
5. EXTERNALLY INSULATE ALL DOMESTIC WATER PIPING.
6. ALL VALVES AND FITTINGS FOR USE IN DOMESTIC WATER SYSTEMS BEAR ALL REQUIRED SEALS AND APPROVALS, AND MUST BE CERTIFIED FOR USE BY THE LOCAL PLUMBING AUTHORITY.
7. PRESSURE TEST ALL DOMESTIC WATER SYSTEMS TO THE REQUIREMENTS OF THE LOCAL PLUMBING AUTHORITY. SUBMIT FORMS TO THE LOCAL PLUMBING AUTHORITY AND PAY ALL FEES.
8. PROVIDE AND INSTALL DRAIN LINES ON ALL PLUMBING AND HVAC EQUIPMENT, INCLUDING CONDENSATE, PRV, OVERFLOW, AND STANDARD DRAIN CONNECTIONS. REFER TO EQUIPMENT INSTALLATION MANUALS. TERMINATE AT NEAREST FLOOR DRAIN OR ELSEWHERE AS REQUIRED BY CODE. USE CPVC ON CONDENSING EQUIPMENT AND ELSEWHERE AS REQUIRED.

PLUMBING PRODUCTS:

GATE VALVES, 65mm AND LARGER:

BRONZE BODY, SCREWED BONNET, NON-RISING STEM, SOLDERED JOINT ENDS, 1380 kPa WATER WORKING PRESSURE TO 93°C, SUITABLE FOR POTABLE WATER USE.

ACCEPTABLE PRODUCT: TOYO 281A OR KITZ 41.

BALL VALVES, 50mm AND SMALLER:

BRASS BODY AND TRIM, c/w HARD CHROME PLATED BALL AND TEFLON REINFORCED SEAT, LEVER HANDLE, FULL BORE, 150 LB RATING, SUITABLE FOR POTABLE WATER USE.

DOMESTIC WATER PIPING:

DOMESTIC WATER PIPING SHALL BE SEAMLESS HARD DRAWN COPPER TUBE TYPE "L" TO ASTM B88M, OR APPROVED EQUIVALENT.

FITTINGS SHALL BE CAST COPPER ALLOW SOLDER JOINT PRESSURE FITTINGS TO BE B16.18 OR B16.22.

SOLDERED JOINTS TO BE ASTM B32 LEAD-FREE ALLOY SOLDERED & WATER FLUSHABLE LEAD-FREE FLUX.

PIPE SUPPORTS IN ACCORDANCE WITH THE PLUMBING CODE.

WATER HAMMER ARRESTERS: STAINLESS STEEL BELLOWS TYPE ACCEPTABLE PRODUCT: ZURN, Z-1700 SHOKTROLS.

DOMESTIC WATER PIPING INSULATION:

PRE-SLIT, FLEXIBLE, POLYMER BASED, CLOSED CELL, CHEMICALLY INERT PIPE INSULATION, c/w PRESSURE SENSITIVE ADHESIVE AND VAPOR BARRIER AND LONGITUDINAL SELF-SEAL LAP JOINT. MAX OPERATING TEMPERATURE: 100°C (210°F).

INSULATION SHALL BE 25mm (1") THICK ON DCW PIPING, AND DHW PIPING 50mm (2") NPS OR SMALLER.

INSULATION SHALL BE 38mm (1 1/2") THICK ON DHW PIPING 65mm (2 1/2") NPS OR LARGER.

ACCEPTABLE PRODUCT: IMCOLOCK OR ARMAFLEX.

WATER HEATER (DHW-1):

COMMERCIAL GRADE ULTRA HIGH EFFICIENT NATURAL GAS MODEL COMPLETE WITH SIDE WALL CONCENTRIC VENTING AND DRAIN KIT. MAINTAIN MANUFACTURER'S REQUIRED CLEARANCES.

PERFORMANCE

CAPACITY:	379L (100 USGAL)
HEAT INPUT:	150,000 BTU/HR
RECOVERY @ 37.8°C(100°F):	681.4 L/HR (180 GPH)
VOLTAGE:	120 VAC/1ø/60Hz
CURRENT:	15A

ACCEPTABLE PRODUCT: BRADFORD WHITE eF SERIES EF-100T-150E-3N(A) OR APPROVED EQUAL.

DOMESTIC WATER HEATER RECIRCULATION PUMP (DRP-1):

INSULATED SELF SENSING VARIABLE FLOW CIRCULATOR PUMP WITH AUTOMATIC NIGHT SETBACK, CONSTANT TEMPERATURE FLOW CONTROL, CIM 300 BACnet COMMUNICATION MODULE, STAINLESS STEEL CONSTRUCTION NSF61 CERTIFIED, APPROVED FOR USE IN POTABLE WATER SYSTEMS.

PERFORMANCE

VOLTAGE:	115V
CURRENT:	0.28-1.01A
POWER:	8.5-107.7W
FLOW:	VARIABLE
MAX HEAD:	8.75m @ 0.63L/s (10GPM)

ACCEPTABLE PRODUCT: GRUNDFOS MAGNA3 32-60F(N)

HYDRONIC SYSTEM NOTES:

1. INSTALL ALL EQUIPMENT ACCORDING TO MANUFACTURER'S INSTRUCTIONS. INCLUDE ALL SENSORS, VALVES, SWITCHES, AND OTHER RELATED COMPONENTS AND FITTINGS TO CONSTITUTE A COMPLETE AND WORKING SYSTEM FOR ALL INSTALLATIONS.
2. PROVIDE MOUNTING HARDWARE AND SUPPORT FRAMEWORK AS REQUIRED.
3. MAINTAIN ALL REQUIRED CLEARANCES ACCORDING TO: MANUFACTURER'S INSTRUCTIONS, THE NATIONAL BUILDING CODE AND CAN/CSA-B149.1.
4. PROVIDE ENGRAVED NAMEPLATES ON ALL EQUIPMENT FOR IDENTIFICATION. EQUIPMENT TAGS SHALL MATCH THE PLANS AND SPECIFICATIONS.
5. LOCATIONS OF NEW BOILERS, HOUSEKEEPING PADS, PIPING, VALVES, & PUMPS SHOWN IN APPROXIMATE LOCATIONS ONLY. ACTUAL LOCATIONS ARE SUBJECT TO SITE CONDITIONS AND REQUIRED CLEARANCES, AND SHALL BE VERIFIED BY THE CONTRACTOR BEFORE PROCEEDING.
6. ENSURE THAT PUMP BODY DOES NOT SUPPORT PIPING OR EQUIPMENT. PROVIDE STANCHIONS OR HANGERS FOR THIS PURPOSE. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR DETAILS. CHECK ROTATION PRIOR TO START-UP. PROVIDE REDUCERS AS REQUIRED.
7. THERMOMETERS SHALL BE INDUSTRIAL, VARIABLE ANGLE TYPE & LIQUID FILLED TO: CAN/CGSB14.4. WELLS SHALL BE BRASS OR STAINLESS STEEL. INSTALL IN LOCATIONS INDICATED AND ON INLET AND OUTLET OF BOILERS. USE EXTENSIONS WHERE THERMOMETERS ARE INSTALLED THROUGH INSULATION. INSTALL BETWEEN EQUIPMENT AND VALVE.
8. PRESSURE GAUGES SHALL BE DIAL TYPE TO: ASME B40.1, STAINLESS STEEL OR PHOSPHOR BRONZE, 0.5% ACCURACY UNLESS OTHERWISE SPECIFIED. TO BE INSTALLED UPSTREAM AND DOWNSTREAM OF PRV'S OUTLET BOILERS.
9. INSTALL MANUAL AIR VENTS AT HIGH POINTS OF ALL HYDRONIC PIPING.
10. SYSTEM TO BE HYDRONICALLY BALANCED TO WITHIN +/-5% OF DESIGN VALUES AS INDICATED. SUPPLY ALL LABOUR AND MATERIALS REQUIRED TO CARRY OUT THE WORK. MAKE REQUIRED ADJUSTMENTS TO MEET SPECIFIED PERFORMANCE UPON REQUEST FROM ENGINEER. SUBMIT FINAL REPORT TO ENGINEER UPON COMPLETION. INCLUDE DIAGRAMS, CHARTS, AND TABLES SHOWING VALVE LOCATION, SETPOINT VALUE, AND FINAL VALUE.
11. ALL EXPANSION TANKS SHALL BE DIAPHRAGM-STYLE, AND CHARGED TO EQUAL ACTUAL SYSTEM PRESSURE AFTER INSTALLATION.
12. INSTALL BALANCING VALVES ON RETURN LINE BRANCHES FOR ALL HOT WATER HEATING DEVICES, AND WHERE INDICATED. VALVES TO BE BRONZE BODY, BRASS BALL, TFE SEAT RINGS WITH MEMORY STOP AND DIFFERENTIAL PRESSURE READOUT PORTS. ON LINE WITH PUMP: INSTALL 10 DIA. DOWNSTREAM OF PUMP, 2 DIA. AWAY FROM FITTING(S) DOWNSTREAM OF VALVE. STRAIGHT RUN: INSTALL 5 DIA. DOWNSTREAM OF FITTING, 2 DIA. AWAY FROM DISTURBANCE DOWNSTREAM OF VALVE. ACCEPTABLE PRODUCT: ITT BELL & GOSSETT, ARMSTRONG CBV, TACO 'ACCU-FLO'.
13. USE DIELECTRIC COUPLINGS WITH THREADED THERMOSETTING PLASTIC ELEMENTS WHEN JOINING DISSIMILAR METALS.
14. ALL DRAINS, PRV'S, AND OVERFLOW LINES SHALL BE PIPED TO A FLOOR DRAIN OR SUITABLE RECEPTACLE. NOTE: USE CPVC FOR BOILER CONDENSATE DRAINS WHERE NEUTRALIZER KITS ARE NOT SPECIFIED.
15. INSTALL AIR VENTS FOR ALL AIR SEPARATORS COMPLETE WITH ISOLATION VALVES AND DRAIN PIPING TO APPROVED VISIBLE DRAIN POINT.
16. PROVIDE LABELING FOR ALL BOILER FEED WATER AND CONDENSATE PIPING IN THE MECHANICAL ROOM. INCLUDE FLOW DIRECTIONAL ARROWS ON EACH STRAIGHT BRANCH, AT 6 METER (20') INTERVALS, AND AT ALL DIRECTIONAL CHANGES ON ALL NEW SUPPLY AND RETURN PIPING IN MECHANICAL ROOM(s)
17. ALL SUPPLY AND RETURN PIPING SHALL BE EXTERNALLY INSULATED IN ITS ENTIRETY, AND SHALL CONFORM TO THE HYDRONIC SYSTEM PRODUCT GUIDELINES.

HYDRONIC SYSTEM PRODUCTS:

PIPE INSULATION:

INSULATION SHALL BE RIGID MOLDED MINERAL FIBRE TO: CAN/CGSB-51.9 AND MAXIMUM 'K' FACTOR TO: CAN/CGSB-51.9 C/W VAPOR BARRIER AND LONGITUDINAL SELF-SEAL LAP JOINT. INSULATION TO BE PROVIDED ON ALL PIPING, VALVES, STRAINERS, FLANGES & FITTINGS UNLESS OTHERWISE SPECIFIED. FINISH WITH PVC JACKET IN ALL EXPOSED AREAS. INSTALLATION AND MATERIALS SHALL CONFORM TO TIAC GUIDELINES.

INSULATION SHALL BE 38mm (1 1/2") THICK ON HOT WATER HEATING PIPING 32mm (1 1/4") NPS OR SMALLER.

INSULATION SHALL BE 50mm (2") THICK ON HOT WATER HEATING PIPING FROM 38mm (1 1/2") - 200mm (8") NPS.

INSULATION SHALL BE 25mm (1") THICK ON RETURN BOILER FEED

HYDRONIC PIPING:

SCHEDULE CARBON 40 STEEL PIPE TO ASTM A53, GRADE 'B'. NPS 50mm (2") AND SMALLER, SCREWED ENDS. NPS 65mm (2 1/2") - 305mm (12"), ROLL GROOVED WITH VICTAULIC FITTINGS.

BOILERS (B-3 & B-4):

BOILERS SHALL BE HIGH EFFICIENCY CONDENSING FIRE TUBE DESIGN FOR VARIABLE FLOW CAPABILITY. BOILERS SHALL BE COMMON DIRECT SIDE WALL VENTED AND SHALL INCLUDE CONDENSATE NEUTRALIZATION KIT. BOILER SHALL MEET ASHRAE 90.1-2016 MINIMUM COMBUSTION EFFICIENCY OF 90% AND INCLUDE STAINLESS STEEL HEAT EXCHANGER, INTEGRAL FLOW SWITCH, LOW WATER CUTOFF, OUTDOOR TEMPERATURE SENSOR, BMS GATEWAY, AND MOTORIZED ISOLATION VALVES.

PERFORMANCE

HEAT INPUT:	1250 MBH
GROSS OUTPUT:	1203 MBH
VOLTAGE:	120V/1ø/60Hz
ACCEPTABLE PRODUCT:	LOCHINVAR CREST FBN1251 OR FULTON ENDURA

HEAT EXCHANGER 1 (HX-1):

PLATE AND FRAME HEAT EXCHANGER WITH STAINLESS STEEL PLATES, HIGH TEMPERATURE RUBBER GASKETS, AND CL150 3" FLANGED CONNECTIONS.

PERFORMANCE

	HOT SIDE	COLD SIDE
FLUID:	WATER	WATER
FLOW:	4.08L/S (64.69 GPM)	4.02L/S (63.79 GPM)
INLET TEMP:	82.2°C (180°F)	32.2°C (90°F)
OUTLET TEMP:	60°C (140°F)	54.4°C (130°F)

ACCEPTABLE PRODUCT: TACO PF 205-11-4-NH OR APPROVED EQUAL

HEAT EXCHANGER 2 (HX-2):

PLATE AND FRAME HEAT EXCHANGER WITH STAINLESS STEEL PLATES, HIGH TEMPERATURE RUBBER GASKETS, AND CL150 3" FLANGED CONNECTIONS.

PERFORMANCE

	HOT SIDE	COLD SIDE
FLUID:	WATER	PROPYLENE GLYCOL/WATER 35/65
FLOW:	0.347L/S (5.498 GPM)	3.785L/S (60 GPM)
INLET TEMP:	54.4°C (130°F)	3.61°C (38.5°F)
OUTLET TEMP:	32.2°C (90°F)	5.75°C (42.35°F)

ACCEPTABLE PRODUCT: TACO PF 205-19-4-NH OR APPROVED EQUAL

HEAT EXCHANGER 3 (HX-3):

PLATE AND FRAME HEAT EXCHANGER WITH STAINLESS STEEL PLATES, HIGH TEMPERATURE RUBBER GASKETS, AND CL150 6" FLANGED CONNECTIONS.

PERFORMANCE

	HOT SIDE	COLD SIDE
FLUID:	WATER	PROPYLENE GLYCOL/WATER 35/65
FLOW:	0.568L/S (9.0 GPM)	0.448L/S (7.1 GPM)
INLET TEMP:	54.4°C (130°F)	30°C (86°F)
OUTLET TEMP:	37.68°C (99.83°F)	52.6°C (126.74°F)

ACCEPTABLE PRODUCT: TACO PF 112-19-4-NH OR APPROVED EQUAL

LABORATORY EXHAUST HEAT CAPTURE COIL (SC-1):

DUCT MOUNTED AIR TO LIQUID HEAT COIL WITH COPPER TUBE AND ALUMINUM FINS. COIL SHALL BE SIZED AS 838mm (33in) x 1473mm (58in). COIL SHALL REDUCE ENTHALPY BY 60% PER ASHRAE 90.1-2016.

PERFORMANCE

FLUID:	PROPYLENE GLYCOL/WATER 35/60
FLOW:	3.785L/S (60 GPM)
AIR EDB:	25°C (77°F)
AIR EWB:	19.44°C (67°F)
AIR LDB/LWB:	3.39°C (38.1°F)
AIR FLOW:	1345L/S (2850 CFM)
AIR PD:	8.4mm (0.33in H20)
FLUID PD:	5.52m (18.1FT)
EFT:	-0.67°C (30.8°F)
LFT:	3.61°C (38.5°F)

ACCEPTABLE PRODUCT: DAIKIN 1-(5WS1006C 33.00x58.00) OR APPROVED EQUAL

LABORATORY EXHAUST/AHU-1 PREHEAT COIL (HC-1):

DUCT MOUNTED LIQUID TO AIR HEAT COIL WITH COPPER TUBE AND ALUMINUM FINS. COIL SHALL BE SIZED AS 838mm (33in) x 1422mm (56in).

PERFORMANCE

FLUID:	PROPYLENE GLYCOL/WATER 35/60
FLUID FLOW:	3.785L/S (60 GPM)
AIR EDB/EWB:	-18.3°C (-1°F)
AIR LDB/LWB:	4.94°C (40.9°F)
AIR FLOW:	3425L/S (7257 CFM)
FLUID PD:	5.52m (18.1FT)
AIR PD:	16.8mm (0.66in H20)
EFT:	5.75°C (42.35°F)
LFT:	-0.67°C (30.8°F)

ACCEPTABLE PRODUCT: DAIKIN 1-(5WS10068 33x58) OR APPROVED EQUAL

SOUTH WING AHU-2 HEATING COIL (HC-2):

REPLACE EXISTING HEATING COIL WITH NEW COIL SIZED FOR LOWER HYDRONIC SYSTEM TEMPERATURE. COIL SHALL BE COPPER TUBE AND ALUMINUM FIN WITH 129 FINS PER FOOT

PERFORMANCE

FLUID:	WATER
FLUID FLOW:	2.215L/S (35.11 GPM)
AIR EDB:	12.8°C (55°F)
AIR LDB:	37.8°C (100°F)
AIR FLOW:	6773L/S (14352 CFM)
FLUID PD:	4.42m (14.51FT)
AIR PD:	16.8mm (2.024in H20)
EFT:	54.4°C (130°F)
LFT:	32.2°C (90°F)

ACCEPTABLE PRODUCT: TRANE DW0B18

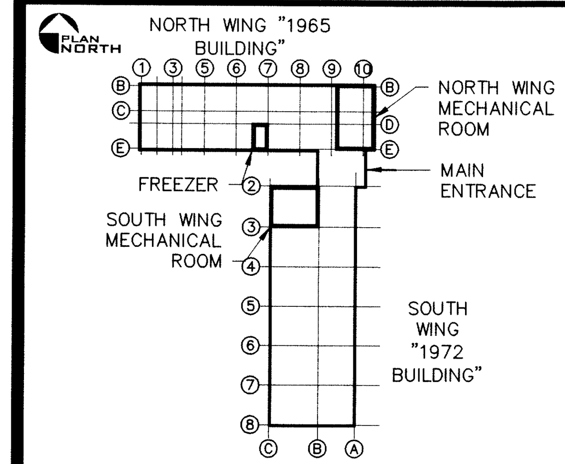
PROFESSIONAL ENGINEER G.D. KELL MEMBER 25161 Gordon Kell 2017 06 23 YR. MN. DAY SASKATCHEWAN

Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
KGS Group
Number C0620
Permission to Consult held by:

Discipline	SK. Reg. No.	Signature
MECHANICAL	20402	[signature]

Environment Canada / Environnement Canada

Real Property Management Division Technical Services / Division Gestion des biens immobilier Services Techniques



BUILDING KEY PLAN

LEGEND

REV	Description	Date
0	ISSUED FOR TENDER	23-JUN-2017

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

project / projet
MECHANICAL UPGRADE
115 PERIMETER ROAD
SASKATOON, SASK.
ENVIRONMENT CANADA
335 River Rd
Ottawa ON. K1V 1C7

drawing / dessin
MECHANICAL SPECIFICATION (SHT 1 OF 2)

Designed By / Conçu par	GDK	Date 2017/05/15 (yyyy/mm/dd)
Drawn By / Dessiné par	BJB	Date 2017/06/05 (yyyy/mm/dd)
Reviewed By / Examiné par	ADR	Date 2017/06/23 (yyyy/mm/dd)
Approved By / Approuvé par	AMB	Date 2017/06/23 (yyyy/mm/dd)

Tender / Soumission
Project Manager / Administrateur de projets
EC PMDI Proj no.
Consultant Proj no. 17-0006-001
Drawing no. / No. du dessin
M01

Plotted by: ccorley Jun 23, 2017 - 5:25pm
PWGSC A1 (841x594)