MECHANICAL SPECIFICATIONS

GENERAL

1. PROVIDE ALL LABOUR, MATERIAL, EQUIPMENT, FEES, PERMITS AND INSPECTIONS BY OUTSIDE AGENCIES AND CHARGES TO PERFORM ALL OPERATIONS FOR THE COMPLETE INSTALLATION OF THE HVAC AND PLUMBING SYSTEMS AS INDICATED.
2. ALL MATERIALS AND INSTALLATION IS TO COMPLY WITH THE ONTARIO BUILDING CODE, NFPA REGULATIONS, ONTARIO FIRE CODE, GAS UTILIZATION CODE, BUILDING STANDARDS FOR THE HANDICAPPED, ONTARIO HYDRO ELECTRICAL CODE AND THE CITY OF THUNDER BAY ENGINEERING STANDARDS.
3. MAINTAIN INSURANCE TO FULLY PROTECT OWNER, CONSULTANT AND SELF FROM ANY AND ALL CLAIMS DUE TO ACCIDENTS, MISFORTUNES, ETC., TO LIMITS SET DOWN BY THE OWNER.
4. REMOVE ALL WASTE MATERIALS AND CLEAN UP TO OWNER'S SATISFACTION. AT THE END OF THE JOB, CLEAN THE EQUIPMENT AND TOUCH UP FINISH TO RESTORE TO "AS NEW" CONDITION.
5. ONLY FIRST CLASS WORKMANSHIP AND GOOD INSTALLATION PRACTICES WILL BE ACCEPTED. USE QUALIFIED TRADESMEN FOR ALL TYPES OF WORK.
6. PROVIDE ALL NECESSARY HANGERS AND SUPPORT STEEL FOR YOUR WORK. TOUCH UP PAINT ALL CUT ENDS OF HANGER RODS AND UNISTRUT SUPPORTS WITH GALVANIZED PAINT.
7. ALL EXPOSED SPIRAL DUCTWORK TO BE SUSPENDED USING THE DUCTMATE CLUTCHER™ MECHANICAL SYSTEM HANGER. SELECT APPROPRIATE HANGER SIZE TO SUIT WEIGHT OF DUCTWORK BEING SUPPORTED. REFER TO MANUFACTURERS INSTALLATION GUIDE FOR SIZING.
8. BE RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED BY YOUR WORK.
9. CONTRACTOR SHALL FULLY PROTECT EXISTING FLOOR SURFACES (IE. PLYWOOD) FROM DAMAGE AS A RESULT OF DEMOLITION/INSTALLATION OF EQUIPMENT OR ANY WORK REQUIRED UNDER THE CONTRACT.
10. PROVIDE SHOP DRAWINGS FOR MAJOR EQUIPMENT COMPONENTS FOR REVIEW BY THE ENGINEER.
11. CO-ORDINATE ALL CUTTING AND PATCHING REQUIRED BY YOUR WORK WITH ARCHITECTURAL.
12. SCOPE OF WORK IS INTENDED TO BE A GENERAL SUMMARY OF THE WORK AND IS NOT ALL INCLUSIVE AND SHALL BE READ IN CONJUNCTION WITH MECHANICAL DRAWINGS AND ASSOCIATED ELECTRICAL DRAWINGS.
13. ONLY JCI METASYS CONTROLS WILL BE ACCEPTED (NO SUBSTITUTIONS), THIS INCLUDES THERMOSTATS. EXISTING METASYS CONTROLLER LOCATED IN THE CRAWLSPACE OF HOUSE 'D'.
14. HAZARDOUS MATERIALS LOCATED IN THE PROJECT AREA WILL BE NOTED IN TEH APPENDICIES OF THE TENDER DOCUMENTS.

PLUMBING

1. ROOFTOP UNIT CONDENSATE DRAIN PIPING TO BE DWV COPPER TO ANSI B16.29-1980.
2. SOLDER/BRAZING TO BE LEAD FREE. ACCEPTABLE MATERIAL: CANFIELD WATERSAFE.
3. BALL VALVES: FULL PORT, BRONZE CONSTRUCTION, CHROME PLATED BALL, CONBRACO 70 SERIES OR EQUAL.
4. HOT WATER HEATING:

2" AND UNDER	SCHEDULE 40 CARBON STEEL, SCREWED ENDS.
2 1/2" AND OVER	SCHEDULE 40 CARBON STEEL, ROLLED GROOVED.

5. PIPE FITTINGS NPS 2 1/2" AND OVER, VICTAULIC, 2" AND UNDER, BLACK MALLEABLE SCREWED. INSULATE NEW/EXISTING PIPING WITH FIBROUS GLASS SPLIT SECTIONAL PIPE INSULATION COMPLETE WITH VAPOUR BARRIER JACKET AND LONGITUDINAL SELF-SEAL LAP JOINT OF THE FOLLOWING THICKNESS:

SERVICE	NPS	THICKNESS
INTERIOR HOT WATER HEATING	1 1/4" AND UNDER	1 1/2"
	1 1/2" AND OVER	2"

VENTILATION

1. ALL DUCTWORK IS TO BE INSTALLED IN ACCORDANCE WITH THE DRAWINGS AND SHALL BE ERECTED IN AN APPROVED, SUBSTANTIAL AND WORKMANLIKE MANNER. DUCTWORK TO BE SMACNA STANDARD. REVIEW ARCHITECTURAL PLANS AND EXISTING SITE CONDITIONS PRIOR TO FABRICATION OF DUCTWORK SYSTEMS.
2. ALL SPIRAL WOUND DUCTWORK SHALL BE MINIMUM 24ga. GALVANIZED OF LOCK FORMING QUALITY TO ASTM A525M.
3. ALL EXPOSED SPIRAL DUCTWORK TO BE PAINTED TO MATCH ROOM COLOURS.
4. SEAL ALL TRANSVERSE JOINTS WITH WATER BASED HIGH PRESSURE DUCT SEALANT. ON EXPOSED DUCTWORK, APPLY SEALANT INTERNALLY.
5. SEAL ALL SPIRAL WOUND DUCTWORK JOINTS WITH SILVER CAULKING.
6. ACOUSTICALLY LINE SUPPLY AND RETURN DUCTWORK TO EXTENTS INDICATED ON DESIGN DRAWINGS. DUCT SIZE SHOWN ACCOMMODATES FOR 25mm THICK LINACOUSTIC INSULATION. DO NOT INCREASE SIZE.
7. EXTERNALLY INSULATE ALL EXHAUST AIR DUCTWORK FULL LENGTH FROM EXHAUST FAN WITH 1 1/2" THICK MINERAL FIBRE BLANKET COMPLETE WITH VAPOR BARRIER.
8. PROVIDE ALL CONTROLS FOR ROOFTOP UNIT INCLUDING THERMOSTATS. MOUNT CENTRE LINE OF THERMOSTATS AT 1200mm ABOVE THE FINISHED FLOOR. WIRE ALL CONTROLS TO MAKE A COMPLETE AND WORKING SYSTEM.
9. ALL AIR SYSTEMS SHALL BE BALANCED BY TAB CONTRACTOR INDEPENDENT OF CONTRACTORS PERFORMING CONSTRUCTION WORK TO ±5% OF DESIGN VALUES SHOWN ON DRAWINGS. TAB CONTRACTOR SHALL SUBMIT AIR BALANCE REPORT IN TWO FORMATS: TWO (2) BOUND HARD COPIES AND ELECTRONIC FORMAT ON CD. SUBMIT AIR BALANCE REPORT FOR REVIEW BY THE DESIGN ENGINEER. THE REPORT SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:
   - -FAN AND MOTOR SPEEDS
   - -FAN MOTOR OPERATING AMPERAGE
   - -AIR FLOWS IN MAIN BRANCH DUCTS
   - -AIR OUTLET FLOWS
   - -TERMINAL UNIT FLOWS
   - -AIRFLOW TEMPERATURES
   - -PRESSURE DROPS ACROSS ALL EQUIPMENT FANS, COILS, FILTERS, ETC.
10. UPON COMPLETION OF CONSTRUCTION, CHANGE OUT ALL FILTERS AND PROVIDE ONE SPARE SET FOR ALL APPLICABLE EQUIPMENT.
11. INSTALL FIRE DAMPERS WHERE INDICATED AND TO CODE TO MAINTAIN INTEGRITY OF FIRE SEPARATION. PROVIDE ACCESS DOOR FOR ALL FIRE DAMPERS.
12. PROVIDE ALL NECESSARY HANGERS AND SUPPORT STEEL FOR EQUIPMENT, DUCTWORK AND PIPING.

STEEL NOTES

1. ALL STRUCTURAL AND MISC. STEEL TO SHALL CONFORM TO C.S.A. G40.21-M GRADE 350W.
2. ALL PLATE SHALL CONFORM TO C.S.A. G40.21-M GRADE 300W.
3. ALL BOLTS, NUTS, AND WASHERS SHALL BE ASTM A325 CADMIUM PLATED.
4. FABRICATION AND ERECTION SHALL CONFORM TO CSA CAN3-S16-14. NO SPLICING WILL BE PERMITTED UNLESS OTHERWISE NOTED ON STRUCTURAL DRAWINGS.
5. ALL WELDS SHALL CONFORM TO CSA STANDARD W59-13. WELDING E49XX ELECTRODES SHALL BE USED.
6. ALL WELDS SHALL BE CLEAN AND FREE OF SLAG.
7. ALL CONNECTIONS SHALL BE DESIGNED FOR FULL STRENGTH OF THE MEMBER UNLESS MEMBER CONNECTION LOADS ARE SHOWN ON DRAWINGS.
8. SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW BEFORE PROCEEDING WITH FABRICATION. SHOP DRAWINGS SHOWING CONNECTION DETAILS DESIGNED BY THE FABRICATOR ARE TO BE STAMPED BY A PROFESSIONAL ENGINEER.
9. PAINT SYSTEM FOR NEW STEEL SHALL BE AS FOLLOWS:

   PRIMER - INTERNATIONAL PAINTS "INTERZINC 52" APPLIED TO 2-3 MILS DRY FILM THICKNESS.

EQUIPMENT LIST

RTU-1 ROOFTOP UNIT	LENNOX MODEL LCH120H4MJ1Y ENERGENCE PACKAGED ROOFTOP UNIT, NOMINAL 10 TON COOLING CAPACITY, SUPPLIED COMPLETE WITH DOWNFLOW CONFIGURATION, HEAVY GAUGE GALVANIZED STEEL CABINET WITH TWO LAYER ENAMEL FINISH, ACCESS PANELS WITH SEALS AND QUARTER TURN HANDLES, FULL PERIMETER HEAVY GAUGE GALVANIZED STEEL BASE RAIL WITH RIGGING HOLES, 30kW ELECTRIC HEAT OPTION, SCR ELECTRIC HEAT CONTROL WITH REMOTE THERMOSTAT AND DUCT SENSOR, PRODIGY 2.0 UNIT CONTROLLER, COPELAND 2 STAGE ULTRA TECH SCROLL COMPRESSORS, COMPRESSOR CRANKCASE HEATERS, THERMAL EXPANSION VALVES, FILTER/DRYERS, COMPRESSOR HIGH/LOW PRESSURE SWITCHES, FREEZESTAT, ENVIRON ALUMINUM COOLING COIL WITH ALUMINUM BRAZED FIN CONSTRUCTION, EVAPORATOR COIL WITH COPPER TUBE CONSTRUCTION, R410A REFRIGERANT CHARGE, PLASTIC DRAIN PAN, OUTDOOR COMBINATION MOTOR, HIGH PREFORMANCE ECONOMIZER WITH BAROMETRIC RELIEF DAMPER AND HOOD, LOWER EXHAUST FAN, CO_2 SENSOR, AND DUCT MOUNTING KIT, FACTORY INSTALLED DISCONNECT SWITCH, GFI SERVICE OUTLETS, DIRTY FILTER SWITCH, BLOWER PROVING SWITCH, DIRTY FILTER SWITCH, SUPPLY/RETURN SMOKE DETECTORS, BACNET COMMUNICATION MODULE, 18" PREFABRICATED ROOF CURB, 208/3/60 POWER. CAPACITY: 4000 cfm @ 1.2" w.g. t.s.p.
EF-1 EXHAUST FAN	GREENHECK MODEL CUE-075-G DIRECT DRIVE UL/cUL 705 LISTED UPBLAST CENTRIFUGAL ROOF EXHAUST FAN SUPPLIED COMPLETE WITH ALUMINUM HOUSING AND CURB CAP, GFI-17-G12 GALV. ROOF CURB, WD-90-PB-8X8 GRAVITY OPERATED BACKDRAFT DAMPER, ALUMINUM BACKWARD INCLINED WHEEL, BIRDSCREEN, NEMA-1TOGGLE SWITCH, FACTORY MOUNTED AND WIRED JUNCTION BOX, 1/6hp 1800 RPM VARI-GREEN MOTOR WITH FACTORY MOUNTED POTENTIOMETER, MOTOR VIBRATION ISOLATION, 120/1/60 POWER. CAPACITY: 200 CFM @ 0.250" E.S.P.
TU-X TERMINAL UNIT	E.H. PRICE MODEL SDV-5000 SINGLE DUCT PRESSURE INDEPENDENT TERMINAL UNIT SUPPLIED COMPLETE WITH 12mm THICK 1.5lb DENSITY INTERNAL INSULATION, CONTROL SHROUD AND MULTI-POINT FLOW SENSOR WITH GAUGE TAPS. REFER TO TERMINAL UNIT SCHEDULE FOR SIZE REQUIREMENTS.
(T)	DDC WALL MOUNTED THERMOSTAT SUPPLIED COMPLETE WITH LCD DISPLAY, SETPOINT ADJUSTER. TO BE COMPATIBLE WITH THE JCI METASYS BAS.
BD BALANCING DAMPER	BLADE DAMPER C/W LOCKING QUADRANT (ECCO KS-145 OR EQUAL)
FD FIRE DAMPER	NCA MODEL FDD TYPE 'A' DYNAMIC CLOSURE FIRE DAMPER SUPPLIED COMPLETE WITH ROLL FORMED GALVANIZED STEEL FRAME WITH SAFETY EDGE, ROLL FORMED GALVANIZED STEEL CURTAIN TYPE BLADES, 165°F FUSIBLE LINK, STAINLESS STEEL SPRING AND ACCESS DOOR. REFER TO DESIGN DRAWINGS FOR TYPE.
CV-X CONTROL VALVE	BELIMO CHARACTERIZED CONTROL VALVE MODEL B2XX+B1TR24-MFT+NC/FC, 2-10 VDC MULTI-FUNCTION TECHNOLOGY, NPTF CONNECTIONS, NICKEL PLATED BRASS BODY, CHROME PLATED BRASS BALL, NICEL PLATED BRASS STEM, PTFE SEATS, EPDM O-RINGS. SIZE AS PER CONTROL VALVE CHART ON DRAWING 'M1'
AD-1 CEILING ACCESS DOOR	ACUDOR PRODUCTS LTD. 24"x24" MODEL FW-5050-DW SELF CLOSING 1.5 HOUR FIRE RATED GYPSUM BOARD CEILING ACCESS DOOR SUPPLIED COMPLETE WITH 20 Ga. STEEL DOOR FILLED WITH 2" THICK FIRE RATED INSULATION, 16 Ga. STEEL FRAME, GYPSUM BOARD TAPING BEAD FLANGE, CONCEALED HINGE, UNIVERSAL SELF LATCHING BOLT WITH FLUSH KEY, INSIDE LATCH RELEASE, WHITE BAKED ON ENAMEL PRIME COAT.

SCOPE OF WORK

1. REMOVE EXISTING AIR CONDITIONING EQUIPMENT COMPLETE WITH LIQUID AND SUCTION PIPING AS INDICATED ON DRAWINGS. REMOVE AIR CONDITIONING EQUIPMENT POWER FEEDS BACK TO SOURCE. REMOVE SPLIT A/C SYSTEM CONTROLS IN THEIR ENTIRETY. PATCH WALL AND ROOF OPENINGS TO MATCH EXISTING CONSTRUCTION.
2. REMOVE EXISTING CORRIDOR GYPSUM BOARD CEILING AND SUSPENSION SYSTEM TO FACILITATE THE DEMOLITION OF EXISTING HVAC EQUIPMENT AND NEW CONSTRUCTION.
3. REMOVE EXISTING VENTILATION UNIT COMPLETE WITH DISTRIBUTION DUCTWORK, WASHROOM DUCTWORK AND EXHAUST FAN AS INDICATED ON DESIGN DRAWINGS. PATCH VENTILATION UNIT ROOF OPENINGS TO MATCH EXISTING CONSTRUCTION. CAP HOT WATER SUPPLY AND HOT WATER RETURN PIPING SERVING VENTILATION UNIT. REMOVE VENTILATION UNIT POWER FEEDS BACK TO SOURCE. RETAIN EXHAUST FAN DUCT ROOF OPENING FOR RE-USE.
4. DRAIN EXISTING HEATING SYSTEM AS REQUIRED AND REMOVE EXISTING HEATING ZONE CONTROL VALVES AS INDICATED. REMOVE ASSOCIATED ZONE THERMOSTATS AND CONTROL WIRING IN ITS ENTIRETY.
5. ALL DEMOLISHED COMPONENTS SHALL BECOME PROPERTY OF THE CONTRACTOR AND BE REMOVED FROM SITE.
6. PROVIDE NEW ROOFTOP UNIT COMPLETE WITH ASSOCIATED DISTRIBUTION DUCTWORK, TERMINAL UNITS, FIRE DAMPERS, GRILLES AND DIFFUSERS. PROVIDE ROOFTOP UNIT CURB AND ROOF IN TO EXISTING ROOF CONSTRUCTION.
7. PROVIDE NEW WASHROOM EXHAUST FAN COMPLETE WITH NEW EXHAUST DUCTWORK AND INSTALL AS INDICATED. ROOF NEW OPENING AS REQUIRED. CONNECT NEW FAN TO RETAINED POWER FEED SERVING REMOVED FAN. REFER TO ELECTRICAL DRAWINGS FOR EXHAUST FAN POWER REQUIREMENTS.
8. PROVIDE NEW CORRIDOR SUSPENDED CEILING COMPLETE WITH NEW LIGHTING. REFER TO ELECTRICAL DRAWINGS FOR DETAILS. REINSTALL RETAINED FIRE ALARM EQUIPMENT INTO NEW CEILING AS INDICATED ON DESIGN DRAWINGS.
9. PROVIDE NEW ZONE HEATING CONTROL VALVES AND INSTALL IN BASEMENT DISTRIBUTION PIPING AS INDICATED. INSULATE NEW AND EXISTING HOT WATER SUPPLY AND HOT WATER RETURN SERVING CONFERENCE CENTRE AS PER SPECIFICATIONS.
10. CONNECT EQUIPMENT TO EXISTING JOHNSON CONTROLS METASYS CONTROL SYSTEM. PROVIDE ADDITIONAL FIELD EQUIPMENT CONTROLS AS REQUIRED TO OPERATE EQUIPMENT AS PER SEQUENCE OF OPERATIONS. PROVIDE NEW TERMINAL UNIT CONTROLLERS, ZONE HEATING CONTROL VALVES AND ZONE THERMOSTATS. MODIFY EXISTING COLOUR GRAPHICAL USER INTERFACE SOFTWARE AS REQUIRED TO REFLECT THE ADDITION OF THE NEW HVAC EQUIPMENT. GRAPHICS SHALL INCORPORATE A FLOOR PLAN OF THE FACILITY INDICATING ZONE TEMPERATURES AND MAJOR EQUIPMENT. CLICKING ON FLOOR PLAN GRAPHICAL SYMBOL SHALL LINK THE OPERATOR TO A DETAILED GRAPHICAL DISPLAY FOR THE SPECIFIC COMPONENT.
11. BALANCE THE SYSTEM AIRFLOWS TO THE QUALITIES INDICATED ON THE DRAWINGS. BALANCING SHALL BE CARRIED OUT BY A CONTRACTOR INDEPENDENT OF THE CONTRACTORS CARRYING OUT UPGRADE WORK. PROVIDE REPORTS FOR REVIEW BY ENGINEER. (1-HARD COPY, 1-ELECTRICAL COPY)
12. COMMISSION EQUIPMENT OPERATION TO ENSURE SYSTEMS FUNCTION IN ACCORDANCE WITH SEQUENCE OF OPERATIONS. COMMISSIONING WORK SHALL BE CARRIED OUT IN CONJUNCTION WITH DESIGN CONSULTANT.
13. DURING CONSTRUCTION KEEP AN ACCURATE RECORD OF ALL DEVIATIONS BETWEEN THE WORK SHOWN ON THE DESIGN DRAWINGS AND THAT WHICH IS INSTALLED. PROVIDE AS-BUILT DRAWINGS TO REFLECT THE ACTUAL INSTALLED CONFIGURATION AND SUBMIT TO THE DESIGN ENGINEER.
14. PROVIDE SYSTEM DEMONSTRATION AND OPERATION AND MAINTENANCE MANUALS FOR ALL EQUIPMENT. O&M MANUALS SHALL BE SUBMITTED IN TWO FORMATS; ONE (1) BOUND HARD COPY AND ONE (1) ELECTRONIC FORMAT ON CD. ELECTRONIC FORMAT SHALL BE COLLATED COMPLETE WITH INDEX AND SECTION DIVIDERS IN THE SAME MANNER AS BOUND HARD COPY. SUBMIT O&M MANUALS TO THE DESIGN ENGINEER.

SEQUENCE OF OPERATION

ROOFTOP UNIT RTU-1

OCCUPIED MODE:
DDC SYSTEM SHALL PROVIDE A WEEKLY SCHEDULE FOR THE OPERATION OF ROOFTOP UNIT RTU-1.

ROOFTOP UNIT BLOWER SHALL RUN CONTINUALLY DURING OCCUPIED HOURS.

ON A RISE IN SPACE TEMPERATURE ABOVE THE AVERAGE OCCUPIED COOLING SETPOINT TEMPERATURE (93°F) AS SENSED BY THE SPACE TEMPERATURE SENSORS. THE DDC SYSTEM SHALL ENERGIZE THE FIRST STAGE OF COOLING. IF THE SPACE TEMPERATURE CONTINUES TO RISE, THE SECOND STAGE OF COOLING SHALL BE ENERGIZED. AS THE SPACE TEMPERATURE FALLS TOWARD THE OCCUPIED SETPOINT TEMPERATURE, THE COOLING STAGES SHALL BE DE-ENERGIZED.

IF THE OUTDOOR AIR TEMPERATURE PERMITS FREE COOLING, MECHANICAL COOLING WILL BE LOCKED OUT AND OUTSIDE AIR WILL BE SUPPLIED TO THE SPACE THROUGH THE ROOFTOP UNIT ECONOMIZER SECTION. WHEN THE SPACE TEMPERATURE SETPOINT IS SATISFIED, ECONOMIZER SECTION OUTSIDE AIR DAMPER SHALL RETURN TO THE FULLY CLOSED POSITION.

ON A DROP IN SPACE TEMPERATURE BELOW THE OCCUPIED HEATING SETPOINT TEMPERATURE (72°F) AS SENSED BY THE SPACE TEMPERATURE SENSOR 'T' OR PROGRAMMABLE THERMOSTAT. THE DDC SYSTEM SHALL MODULATE THE RESPECTIVE ZONE HEATING CONTROL VALVE TOWARD THE FULL OPEN POSITION. AS THE SPACE TEMPERATURE RISES TOWARD THE SETPOINT TEMPERATURE, THE DDC SYSTEM SHALL MODULATE THE CONTROL VALVE TOWARD THE CLOSED POSITION.

THE ROOFTOP UNIT INTERNALLY MOUNTED CARBON DIOXIDE (CO_2) SENSOR SHALL MONITOR THE RETURN AIR CO_2 LEVEL AND INITIATE A MIXED AIR SEQUENCE IF THE RETURN AIR CO_2 LEVEL RISE ABOVE THE SETPOINT LEVEL. THE ROOFTOP UNIT ECONOMIZER SECTION SHALL MODULATE THE OUTSIDE AIR DAMPER TO MAINTAIN THE CO_2 LEVEL AT SETPOINT (ADJUSTABLE). ECONOMIZER SECTION OUTSIDE AIR DAMPER TO BE NORMALLY AT THE CLOSED POSITION AND IS INITIATED ONLY BY A CALL FOR COOLING OR CO_2 DETECTION.

WITH NO COOLING CALL, THE SCR ELECTRIC HEATER CONTROL SHALL MODULATE THE ELECTRIC HEATER SECTION OUTPUT TO MAINTAIN THE UNIT DISCHARGE AIR TEMPERATURE AT SETPOINT (72°F)

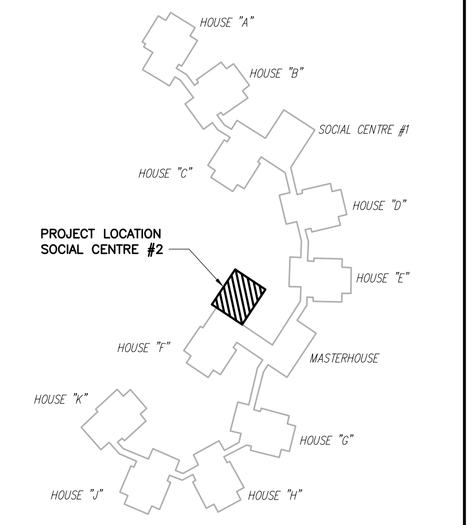
UNOCCUPIED MODE:
DURING UNOCCUPIED HOURS A SETBACK OF THE SPACE HEATING TEMPERATURE TO 65°F SHALL BE INITIATED. THE ROOFTOP UNIT BLOWER SHALL REMAIN IN THE 'OFF' POSITION. THE OUTDOOR AIR DAMPER SHALL MOVE TO THE FULLY CLOSED POSITION. THE RETURN AIR DAMPER SHALL MOVE TO THE FULLY OPEN POSITION. ON A DROP IN SPACE TEMPERATURE BELOW THE UNOCCUPIED SETPOINT TEMPERATURE AS SENSED BY THE SPACE TEMPERATURE SENSORS 'T'. MSAY BLOWER CONTROL WILL STAGE THE SUPPLY BLOWER SPEED ACCORDING TO COMPRESSOR STAGING. THE DDC SYSTEM SHALL MODULATE THE RESPECTIVE ZONE HEATING CONTROL VALVE TOWARD THE FULL OPEN POSITION.

PRESSING THE THERMOSTAT OVERRIDE BUTTON SHALL OVERRIDE THE SYSTEM 'ON' FOR 2 HOURS UNTIL PUSHED AGAIN OR THE NEXT SCHEDULED PERIOD. THE ROOFTOP SHALL OPERATE AS PER OCCUPIED MODE.

EXHAUST FAN EF-1

DDC SYSTEM SHALL PROVIDE A WEEKLY SCHEDULE FOR THE OPERATION OF EF-1.

EXHAUST FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED HOURS.



KEY PLAN
SCALE: N.T.S.

DIFFUSER / GRILLE SCHEDULE

ROOM	EQUIP. No.	SUPPLY AIR				RETURN / EXHAUST AIR			
		TYPE	QTY.	CFM	SIZE	TYPE	QTY.	CFM	SIZE
M100 CONFERENCE ROOM 'E'	TU-1	A	6	85	12x4	H	2	255	16x8
M101 CONFERENCE ROOM 'B'	TU-2	A	6	85	12x4	H	2	255	16x8
M102 CONFERENCE ROOM 'A'	TU-3	B	3	165	12x6	J	1	1630	32x16
	TU-3	C	4	165	12x6	-	-	-	-
	TU-3	D	3	165	12x6	-	-	-	-
M103 FIRESIDE LOUNGE	TU-4	E	2	130	12x5	K	1	520	18x10
	TU-4	F	2	130	12x5	-	-	-	-
M104 CONFERENCE ROOM 'C'	TU-5	G	4	85	12x4	H	2	170	16x8
M105 CONFERENCE ROOM 'D'	TU-6	G	4	85	12x4	H	2	170	16x8
M106 MEN'S WASHROOM	EF-1	-	-	-	-	M	1	100	6x6
M107 WOMEN'S WASHROOM	EF-1	-	-	-	-	M	1	100	6x6
XM109 CORRIDOR	TU-7	L	1	105	24x24	-	-	-	-

REMARKS: (BASED ON EH. PRICE)

TYPE A	SDGE//I/8/12/4/DD/S/3/A/B15
TYPE B	SDGE//I/12/12/6/DD/S/3/A/B15
TYPE C	SDGE//I/14/12/6/DD/S/3/A/B15
TYPE D	SDGER//I/14/12/6//////A/B15
TYPE E	SDGE//I/10/12/5/DD/S/3/A/B15
TYPE F	SDGER//I/10/12/5//////A/B15
TYPE G	SDGE//I/6/12/4/DD/S/3/A/B15
TYPE H	16in x 8in/510Z/F/L/A/B15
TYPE J	32in x 16in/510Z/F/L/A/B15
TYPE K	18in x 10in/510Z/F/L/A/B15
TYPE L	6in x 6in/24in x 24in/SMD-FR/SPF/3P/1S/B12 (c/w SPF MOUNTING FRAME)
TYPE M	6in x 6in/510Z/F/L/A/B15

TERMINAL UNIT SCHEDULE

(BASED ON EH. PRICE SDV)

TERMINAL UNIT No.	SIZE	CONTROL ASSEMBLY	AREA SERVED	MIN./MAX. CFM
TU-1	7	RIGHT HAND	M100 CONFERENCE ROOM 'E'	98/490
TU-2	7	RIGHT HAND	M101 CONFERENCE ROOM 'B'	98/490
TU-3	12	RIGHT HAND	M102 CONFERENCE ROOM 'A'	326/1630
TU-4	7	RIGHT HAND	M103 FIRESIDE LOUNGE	104/520
TU-5	6	RIGHT HAND	M104 CONFERENCE ROOM 'C'	68/340
TU-6	6	RIGHT HAND	M105 CONFERENCE ROOM 'D'	68/340
TU-7	4	RIGHT HAND	XM109 CORRIDOR	21/105

CONTROL VALVE SCHEDULE

VALVE No.	AREA/EQUIPMENT SERVED	SIZE	CV RATING
CV-1	M100 CONFERENCE ROOM 'E'	1/2ø	0.46
CV-2	M101 CONFERENCE ROOM 'B'	1/2ø	0.46
CV-3	M102 CONFERENCE ROOM 'A'	1/2ø	1.2
CV-4	M103 FIRESIDE LOUNGE	1/2ø	0.8
CV-5	M104 CONFERENCE ROOM 'C'	1/2ø	0.46
CV-6	M105 CONFERENCE ROOM 'D'	1/2ø	0.46
CV-7	XM109 CORRIDOR	1/2ø	0.9

MANUAL CIRCUIT BALANCING VALVE SCHEDULE

VALVE No.	AREA/EQUIPMENT SERVED	SIZE	FLOW RATE (GPM)
MBV-1	M101 CONFERENCE ROOM 'B'	1/2ø	0.46

MECHANICAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ELECTRICAL DRAWINGS

No.	Revision	Date	Initial
0	ISSUED FOR CONSTRUCTION	23/05/17	DS
A	ISSUED FOR 90% CLIENT REVIEW	25/05/16	DS

Notes:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING DIMENSIONS AND EXISTING CONDITIONS AT THE OUTSET OF CONSTRUCTION. REPORT ANY DISCREPANCIES TO THE ENGINEER. DO NOT PROCEED WITHOUT FURTHER WRITTEN DIRECTION FROM THE ENGINEER.
2. DRAWING SHOWS GENERAL ARRANGEMENT ONLY. DO NOT SCALE.

Approved

Approved

LICENSED PROFESSIONAL ENGINEER D. W. SHALLEY May 27/17 PROVINCE OF ONTARIO

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LAKEHEAD UNIVERSITY
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BARTLEY CONFERENCE CENTER A/C UPGRADE
MECHANICAL SPECIFICATIONS
EQUIPMENT LIST, SCOPE OF WORK,
AND SEQUENCE OF OPERATION

Scale:	Drawn By: DWF	Date:
AS NOTED	Ckd. By: DS	MAY 2017
	Dwg. No.: 16-067-M4	Rev. 0