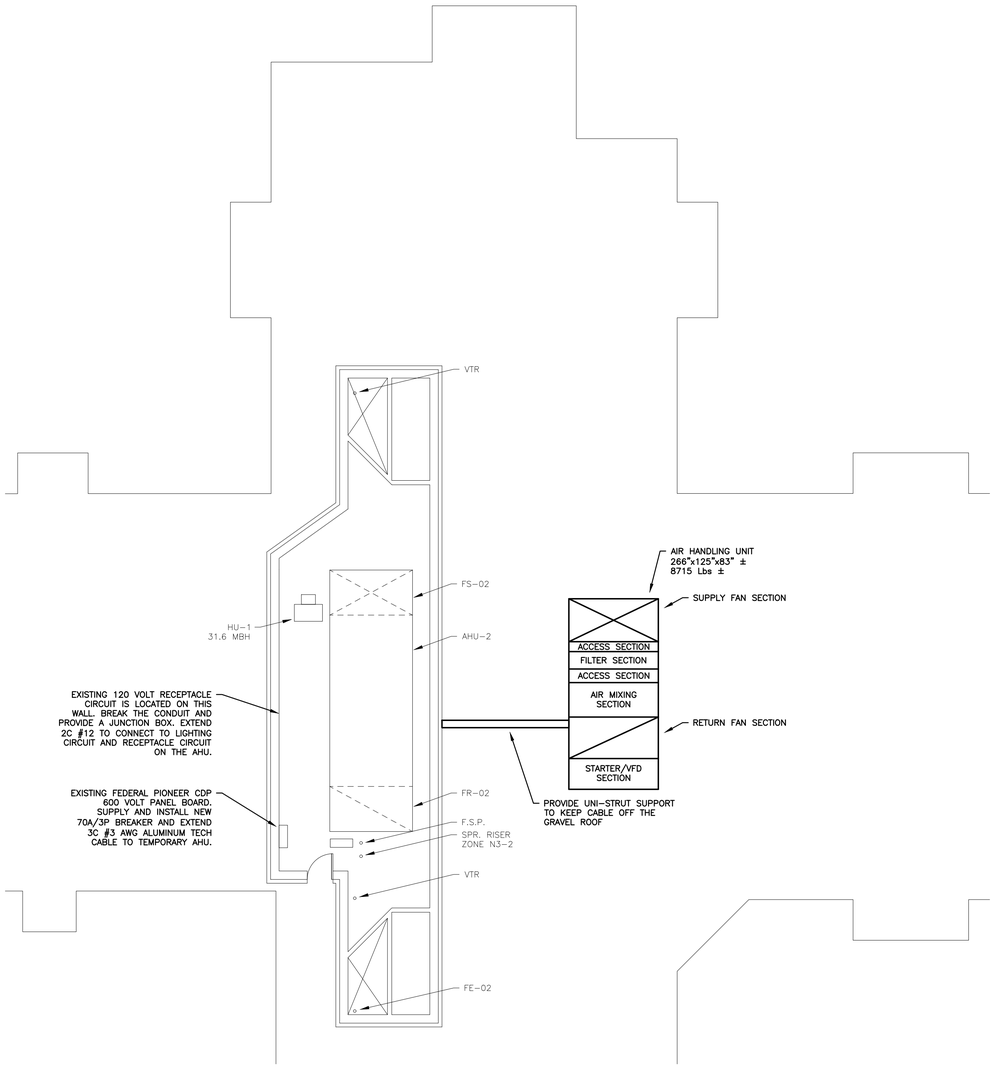
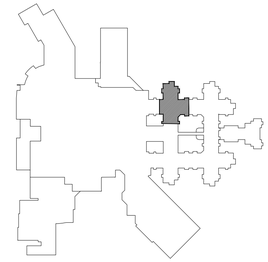


1 PARTIAL ROOF PLAN
SCALE: 1:100



2 KEY PLAN
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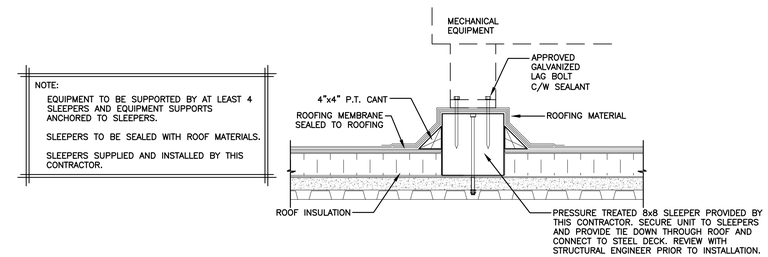

3 ROOF EQUIPMENT SLEEPER DETAIL
SCALE: N.T.S.

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NO.	REVISIONS	DD/MM/YY
2	ISSUED FOR TENDER	21/11/19
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Stamp
REGISTERED PROFESSIONAL ENGINEER
J. DOUGLAS MATHESON
No. 3801
PROVINCE OF PRINCE EDWARD ISLAND

Scale	AS INDICATED
Date	NOVEMBER 21, 2019
Drn By	BCJP
Chk'd By	MA
Project No.	19-175

QEH NEW AIR HANDLING UNIT

Sheet Title
PARTIAL ROOF PLAN

Sheet No.
M1 of M2

1.0 GENERAL

1.1 GENERAL CONDITIONS:
ALL CONTRACT GENERAL CONDITIONS APPLY TO THIS SECTION.

1.2 SCOPE OF WORK:
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.

THIS SHALL INCLUDE BUT NOT LIMITED TO THE FOLLOWING:
- PROVISION OF NEW TEMPORARY AHU.
- PROVISION OF STRUCTURAL SUPPORT FRAME AS DETAILED.
- CUTTING & PATCHING OF ROOF.
- CRANING TO INSTALL UNIT IN LOCATION.
- POWER FEED TO NEW UNIT AS DETAILED OR SPECIFIED HEREIN.
- START-UP OF UNIT AS SPECIFIED.

1.3 SITE VISITS:
BEFORE COMMENCING WORK VISIT SITE AND VERIFY THAT REQUIREMENTS OF PLANS AND SPECIFICATIONS ARE CONSISTENT WITH SITE CONDITIONS.

ADVISE THE ENGINEER IN WRITING OF ANY DISCREPANCIES OR CONFLICTS.

NO ALLOWANCE SHALL BE MADE FOR FAILURE TO INCLUDE ITEMS WHICH A THOROUGH INVESTIGATION WOULD HAVE SHOWN TO BE REQUIRED.

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.

1.5 SAFETY REQUIREMENTS:

.1 CARRY OUT WORK OF THIS CONTRACT PLACING MAXIMUM EMPHASIS ON SAFETY FOR ALL WORKERS AND OTHER AUTHORIZED PERSONS WORKING OR CIRCULATING ON THE CONSTRUCTION SITE AS WELL AS SAFETY FOR BUILDING TENANTS ON FEDERAL GOVERNMENT PROPERTY. CONTRACTOR TO PREPARE SAFETY PLAN FOR REVIEW AND ACCEPTANCE PRIOR TO WORK PROCEEDING ON SITE.

.2 OBSERVE AND ENFORCE CONSTRUCTION SAFETY MEASURES REQUIRED BY THE NATIONAL BUILDING CODE OF CANADA, THE CANADA LABOR CODE PART 11, THE PROVINCIAL OCCUPATIONAL HEALTH AND SAFETY REGULATIONS, PROVINCIAL WORKER'S COMPENSATION BOARD, MUNICIPAL STATUTES AND AUTHORITIES, AND OWNER"S PLANT SAFETY REQUIREMENTS.

.3 IN EVENT OF CONFLICT BETWEEN ANY PROVISIONS OF ABOVE AUTHORITIES WITH THE MOST STRINGENT PROVISIONS WILL APPLY.

.4 COMPLY WITH REQUIREMENTS OF STANDARD FOR BUILDING CONSTRUCTION OPERATIONS FCC NO. 301 AND STANDARD FOR WELDING AND CUTTING FCC NO. 302 ISSUED BY THE FIRE COMMISSIONER OF CANADA.

.5 ELECTRICAL LOCK-OUT:

ENSURE THAT ELECTRICAL LOCK-OUT PROCEDURES ARE IN PLACE AND THAT A GUARANTEE OF ISOLATION IS OBTAINED BEFORE STARTING WORK ON ANY ELECTRICAL CIRCUIT OR FACILITY. CHECK FOR AND OBTAIN ANY SITE SPECIFIC GUARANTEE OF ELECTRICAL ISOLATION RULES AND PROCEDURES AS MAY BE ESTABLISHED BY CLIENT/BUILDING OWNER.

CLIENT/BUILDING OWNER:

THE ELECTRICAL LOCK-OUT PROCEDURES SHALL BE IN ACCORDANCE WITH SAFETY MEASURES REFERENCED IN .2 ABOVE AND SHALL INCLUDE LOCK-OUT TAGS, A WRITTEN RECORD OF ALL EVENTS (SIGNED OFF), ETC.

.6 WHMIS:

COMPLY WITH REQUIREMENTS OF WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) REGARDING USE, HANDLING, STORAGE AND DISPOSAL OF HAZARDOUS MATERIALS AND REGARDING LABELING AND PROVISION OF MATERIAL SAFETY DATA SHEETS ACCEPTABLE TO LABOUR CANADA AND HEALTH AND WELFARE CANADA.

DELIVER COPIES OF WHMIS DATA SHEETS TO THE PROJECT MANAGER ON DELIVERY OF MATERIALS.

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 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.

1.8 SHOP DRAWINGS:

CONTRACTOR TO SUBMIT ELECTRONIC PDF SHOP DRAWINGS C/W TRANSMITTAL AND SEQUENTIAL NUMBERING SYSTEM FOR REVIEW.

1.9 INSTALLATION OF EQUIPMENT:

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.

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.

1.10 IDENTIFICATION:

MANUFACTURER'S NAMEPLATE:
PROVIDE ON EACH PIECE OF EQUIPMENT A METAL NAMEPLATE, MECHANICALLY FASTENED WITH RAISED OR RECESSED LETTERS.

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.

1.11 FINAL INSPECTION:

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.

ALL OF THE ABOVE MUST BE COMPLETED PRIOR TO THE FINAL INSPECTION BY THE ENGINEER AND SUBSTANTIAL COMPLETION OF THE MECHANICAL SYSTEMS.

1.12 OPERATION AND MAINTENANCE MANUALS:

CONTRACTOR TO PROVIDE MAINTENANCE MANUALS FOR ALL EQUIPMENT INSTALLED. THREE (3) COPIES ORGANIZED IN 8 1/2" X 11" BINDERS TO BE PROVIDED.

1.13 RECORD DRAWINGS:

CONTRACTOR TO PROVIDE AS-BUILT RECORD DRAWINGS.

1.14 GUARANTEE:

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.

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 HVAC:

2.1 MODULAR AIR HANDLING UNITS:

.1 PROVIDE PACKAGED MODULAR AIR HANDLING UNITS AS SPECIFIED HEREIN. CARRIER, YORK, AND TRANE CONSIDERED ACCEPTABLE PRODUCTS PROVIDED ALL FEATURES ARE INCLUDED.

.2 SUPPLIERS ARE CAUTIONED THAT THE UNITS MUST BE EQUAL OR BETTER IN ALL SIGNIFICANT RESPECTS TO THE TRANE CSAA UNITS SPECIFIED TO BE CONSIDERED.

.3 QUALITY ASSURANCE

.1 AIR-HANDLING UNIT ASSEMBLY SHALL HAVE UL 1995 CERTIFICATION FOR SAFETY, INCLUDING USE WITH ELECTRIC HEAT.

.2 PRODUCTS REQUIRING ELECTRIC CONNECTION SHALL BE LISTED AND CLASSIFIED BY ETL AND CSA AS SUITABLE FOR THE PURPOSE SPECIFIED AND INDICATED.

.3 COIL PERFORMANCE SHALL BE CERTIFIED IN ACCORDANCE WITH AHRI STANDARD 410, LATEST EDITION.

.4 UNIT PERFORMANCE SHALL BE RATED IN ACCORDANCE WITH AHRI STANDARD 430 FOR CENTRAL AIR HANDLING UNITS AND SUBJECT TO VERIFICATION OF RATING ACCURACY BY AHRI-SPONSORED, THIRD PARTY TESTING. UNITS SHALL MEET NFPA 90A REQUIREMENTS.

.4 GENERAL DESCRIPTION

.1 UNITS SHALL SHIP IN THE NUMBER OF SECTIONS NECESSARY TO MEET PROJECT INSTALLATION REQUIREMENTS. CONTRACTOR TO COORDINATE WITH MANUFACTURE PRIOR TO SHIPPING.

.2 UNIT SHALL BE FACTORY-SUPPLIED, OUTDOOR CENTRAL STATION AIR HANDLER. THE AIR-HANDLING UNIT SHALL CONSIST THE FACTORY-INSTALLED COMPONENTS AS INDICATED ON THE EQUIPMENT SCHEDULE.

.3 MANUFACTURER PROVIDED VFD'S SHALL BE CERTIFIED TO AHRI STANDARD 1210 TO ENSURE DOCUMENTED AND RELIABLE VFD EFFICIENCY.

.5 CASING

.1 CONSTRUCTION:
.1 ALL UNITS SHALL BE SUPPLIED WITH 14-GAGE OR HEAVIER, G-90 GALVANIZED STEEL BASE RAILS. PERIMETER LIFTING LUGS FOR OVERHEAD LIFTING SHALL BE PROVIDED ON EACH SHIPPING SECTION.
.2 UNIT SHALL BE THERMALLY BROKEN TO MINIMIZE THE CONDUCTION PATH FROM THE INSIDE OF THE CASING TO THE OUTSIDE.
.3 CASING PANELS (TOP, SIDES, AND BOTTOM) SHALL BE CONSTRUCTED OF GALVANIZED STEEL WITH THE FOLLOWING FINISHES:
.1 EXTERIOR : PAINTED WITH WATER BASED POLYURETHANE PAINT ABLE TO WITHSTAND A SALT SPRAY TEST IN ACCORDANCE WITH ASTMB117 G-90 GALVANIZED STEEL.
.2 INTERIOR: PRE-COATED WITH A SILVER ZEOLITE ANTIMICROBIAL MATERIAL REGISTERED BY THE US EPA FOR USE IN HVAC APPLICATIONS.
.4 CASING PANELS (TOP, SIDES, AND BOTTOM) SHALL BE ONE PIECE, DOUBLE-WALL CONSTRUCTION WITH INSULATION SEALED BETWEEN THE INNER AND OUTER PANELS. PANEL ASSEMBLIES SHALL NOT CARRY AN R-VALUE OF LESS THAN 13.
.5 CASING DEFLECTION SHALL NOT EXCEED A 1:200 RATIO WHEN SUBJECT TO AN INTERNAL PRESSURE OF ± 8-IN. WG. CASING LEAKAGE RATE SHALL BE LESS THAN 1% AT 8 IN. WG OF NOMINAL UNIT AIRFLOW OR 50 CFM, WHICHEVER IS GREATER.
.6 FAN SUPPORTS, STRUCTURAL MEMBERS, PANELS, OR FLOORING SHALL NOT BE WELDED, UNLESS ALUMINUM, STAINLESS STEEL, OR OTHER CORROSION-RESISTANT MATERIAL IS USED.
.7 ALL COIL SECTIONS SHALL BE DOUBLE-WALL CONSTRUCTION WITH INSULATION SEALED BETWEEN THE INNER AND OUTER PANELS.
.8 BLOW-THRU SECTIONS SHALL HAVE A DIFFUSER PLATE AS AN INTEGRAL PART OF THE FAN SECTION.

.2 PROVIDE THE FOLLOWING ACCESSORIES :
.1 HINGED DOUBLE-WALL ACCESS DOORS AS INDICATED (SEE SCHEDULE) WITH REMOVABLE ACCESS PANEL(S) ON THE OTHER SIDE.
.2 FACTORY INSTALLED THERMAL PANE REINFORCED GLASS VIEWPORTS AS INDICATED (SEE SCHEDULE)
.3 FACTORY INSTALLED MARINE LIGHTS AS INDICATED (SEE SCHEDULE)

.3 DRAIN PANS:
DRAIN PANS SHALL BE INSULATED DOUBLE-WALL GALVANIZED OR STAINLESS STEEL CONSTRUCTION. THE PAN SHALL BE SLOPED TOWARD THE DRAIN CONNECTION. DRAIN PAN SHALL HAVE 11/2-IN. MPT CONNECTION EXITING THROUGH THE HAND SIDE OR OPPOSITE SIDE OF THE CASING AS REQUIRED TO SUIT THE SITE CONDITIONS. CONTRACTOR TO COORDINATE WITH MANUFACTURER PRIOR TO AHU CONSTRUCTION. ONE DRAIN OUTLET SHALL BE SUPPLIED FOR EACH COOLING COIL, HUMIDIFIER SECTION, AND OUTDOOR AIR SECTION. DRAIN PAN SHALL ALLOW NO STANDING WATER AND COMPLY WITH ASHRAE STANDARD 62.1-2010.

.6 FANS
.1 GENERAL:
.1 ENTIRE FAN ASSEMBLY SHALL BE CLEANED, PRIMED AND PAINTED WITH ALKYD ENAMEL, EXCEPT FOR AN ALUMINUM FAN WHEEL WHEN SUPPLIED. THEY SHALL BE DESIGNED FOR CONTINUOUS OPERATION AT THE MAXIMUM RATED FAN SPEED AND MOTOR HORSEPOWER. FANS SHALL HAVE AN AMCA CLASS RATING CORRESPONDING TO THE STATIC PRESSURE AT WHICH THE FAN IS DESIGNED TO OPERATE (CLASS I, II, OR III). COMPLETED FAN ASSEMBLY SHALL BE DYNAMICALLY BALANCED.
.2 FAN ASSEMBLY VIBRATION SHALL NOT EXCEED 0.248 IN. PER SECOND WHEN MOUNTED ON ACTIVE ISOLATORS. VIBRATION SHALL BE MEASURED IN BOTH VERTICAL AND HORIZONTAL DIRECTIONS AT THE SPECIFIED FAN OPERATING SPEED USING SPECIFIED MOTOR. ACCELEROMETERS SHALL BE MOUNTED ON THE MOTOR NEAR THE BEARING LOCATIONS.
.3 ALL FAN SLED COMPONENTS SHALL PROVIDE CORROSION PROTECTION TO PASS 100-HOUR SALT SPRAY TEST PER ASTM B-117.
.4 FAN WHEELS SHALL BE KEYED TO THE SHAFT AND SHALL BE DESIGNED FOR CONTINUOUS OPERATION AT MAXIMUM RATED FAN SPEED AND MOTOR HORSEPOWER. FAN WHEELS AND SHAFTS SHALL BE SELECTED WITH A MAXIMUM OPERATING SPEED 25% BELOW THE FIRST CRITICAL.
.5 BELT DRIVE FAN MOTOR SHALL BE MOUNTED WITHIN THE FAN SECTION CASING ON SLIDE RAILS EQUIPPED WITH ADJUSTING SCREWS. MOTOR SHALL BE PREMIUM EFFICIENCY, OPEN DRIP-PROOF OR TOTALLY ENCLOSED FAN COOLED NEMA DESIGN A OR B WITH SIZE AND ELECTRICAL CHARACTERISTICS AS SHOWN ON THE EQUIPMENT SCHEDULE. ALL THREE-PHASE MOTORS SHALL HAVE A ± 10% VOLTAGE UTILIZATION RANGE AND A 1.15 MINIMUM SERVICE FACTOR.
.2 PERFORMANCE RATINGS:
FAN PERFORMANCE SHALL BE RATED AND CERTIFIED IN ACCORDANCE WITH AHRI STANDARD 430, LATEST EDITION.
.3 SOUND RATINGS:
MANUFACTURER SHALL SUBMIT FIRST THROUGH EIGHTH OCTAVE SOUND POWER FOR FAN DISCHARGE AND CASING RADIATED SOUND. SOUND RATINGS SHALL BE TESTED IN ACCORDANCE WITH AHRI 260.
.4 MOUNTING:
FAN SCROLL, WHEEL, SHAFT, BEARINGS, DRIVES, AND MOTOR SHALL BE MOUNTED ON A COMMON BASE ASSEMBLY. THE BASE ASSEMBLY IS ISOLATED FROM THE OUTER CASING WITH FACTORY-INSTALLED ISOLATORS AND RUBBER VIBRATION ABSORBENT FAN DISCHARGE SEAL. UNIT SHALL USE 2-IN. DEFLECTION SPRING ISOLATORS.
.5 FAN ACCESSORIES:
.1 BELT GUARDS.
.2 INLET SCREEN.

.7 BEARINGS AND DRIVES
.1 BEARINGS:
SELF-ALIGNING, GREASE LUBRICATED, ANTI-FRICTION WITH LUBRICATION FITTINGS EXTENDED TO DRIVE SIDE OF FAN SECTION. PROVIDE GREASE FITTINGS EXTENDED TO THE EXTERIOR OF THE CASING. ALL BEARING LIFE CALCULATIONS SHALL BE DONE IN ACCORDANCE WITH ABMA 9 FOR BALL BEARINGS AND ABMA 11 FOR ROLLER BEARINGS. BEARINGS SHALL BE SELECTED FOR A MINIMUM AVERAGE LIFE (L50) OF 200,000 HOURS.
.2 SHAFTS:
FAN SHAFTS SHALL BE SOLID STEEL, TURNED, GROUND, POLISHED AND COATED WITH A RUST INHIBITOR.
.3 V-BELT DRIVE:
DRIVE SHALL BE DESIGNED FOR A MINIMUM 1.5 SERVICE FACTOR. DRIVES SHALL BE VARIABLE PITCH FOR MOTORS 15 HP AND LESS. ALL DRIVES SHALL BE FACTORY MOUNTED, WITH SHEAVES ALIGNED AND BELTS PROPERLY TENSIONED.

.8 COILS
.1 ALL WATER, STEAM AND DIRECT EXPANSION (DX) REFRIGERANT COILS SHALL BE PROVIDED TO MEET THE SCHEDULED PERFORMANCE. ALL COIL PERFORMANCE SHALL BE CERTIFIED IN ACCORDANCE WITH AHRI STANDARD 410. ALL WATER AND DIRECT EXPANSION COILS SHALL BE TESTED AT 450 PSIG AIR PRESSURE.
.2 GENERAL FABRICATION:
.1 ALL WATER AND REFRIGERANT COILS SHALL HAVE MINIMUM 1/2-IN.OD COPPER TUBES MECHANICALLY EXPANDED INTO FINS TO ENSURE HIGH THERMAL PERFORMANCE WITH LOWER TOTAL FLOW AND PUMPING REQUIREMENTS. MINIMUM TUBE WALL THICKNESS SHALL BE 0.016 INCHES.
.3 HYDRONIC HEATING AND COOLING COILS:
.1 HEADERS SHALL BE CONSTRUCTED OF STEEL WITH STEEL MPT CONNECTIONS. HEADERS SHALL HAVE DRAIN AND VENT CONNECTIONS ACCESSIBLE FROM THE EXTERIOR OF THE UNIT. OPTIONAL NON-FERROUS HEADERS AND RED BRASS MPT CONNECTIONS SHALL BE SUPPLIED IF SPECIFIED.
.2 CONFIGURATION: COILS SHALL BE DRAINABLE, WITH NON-TRAPPING CIRCUITS. COILS WILL BE SUITABLE FOR A DESIGN WORKING PRESSURE OF 300 PSIG AT 200 F.

.9 FILTER SECTIONS:
.1 FLAT FILTER SECTIONS SHALL ACCEPT EITHER 2-IN. OR 4-IN. FILTERS. SECTIONS SHALL INCLUDE SIDE ACCESS SLIDE RAILS.
.2 PROVIDE C/W DWYER MAGNEHELIC GAGES OR EQUAL. REFER TO SCHEDULE FOR FILTER EFFICIENCIES.

.10 DAMPERS
.1 MIXING BOXES, FILTER-MIXING BOXES, AND EXHAUST BOXES SHALL HAVE PARALLEL OR OPPOSED BLADES AND INTERCONNECTING OUTSIDE-AIR AND RETURN-AIR DAMPERS
.2 DAMPER BLADES SHALL BE CONSTRUCTED OF GALVANIZED STEEL WITH A DOUBLE-SKIN AIRFOIL DESIGN, WITH BLADE SEALS AND STAINLESS STEEL JAMB SEALS. BLADES SHALL BE MECHANICALLY FASTENED TO AXLE RODS ROTATING IN SELF-LUBRICATING SYNTHETIC BEARINGS. MAXIMUM LEAKAGE RATE SHALL BE 2 CFM/FT2 AT 1 IN. WG (0.25 KPA) DIFFERENTIAL PRESSURE.

.11 REFER TO EQUIPMENT SCHEDULE ON DRAWINGS FOR INDIVIDUAL AHU REQUIREMENTS.

.12 PROVIDE START-UP BY MANUFACTURER AUTHORIZED TECHNICIAN.

START-UP TO INCLUDE:

- VERIFICATION OF UNIT TO BE OPERATIONAL.

- CONFIRM AIRFLOW AND UNIT PERFORMANCE BASED ON NO DUCTWORK.

SUBMIT START-UP REPORTS TO ENGINEER.

3.0 ELECTRICAL

3.1 EXAMINATION OF SITE AND CONDITIONS

.1 EXAMINE THE SITE AND LOCAL CONDITIONS AFFECTING THE WORK WITH ALL TENDER DOCUMENTS, TO ENSURE THE WORK CAN BE SATISFACTORILY PERFORMED AS SHOWN. PRIOR TO COMMENCING WORK, EXAMINE THE WORK OF OTHER DIVISIONS AND REPORT AT ONCE ANY DEFECT OR INTERFERENCE AFFECTING THE WORK OF THIS CONTRACTOR. NO ALLOWANCE WILL BE MADE LATER FOR ANY EXPENSES INCURRED THROUGH FAILURE TO MAKE THIS EXAMINATION OR TO REPORT ANY DISCREPANCIES IN WRITING.

1. THIS CONTRACTOR IS TO ATTEND ALL SITE MEETINGS PRIOR TO CLOSE OF TENDER TO CONFIRM SCOPE OF WORK.

3.2 BY-LAW AND REGULATIONS

1. CONFORM WITH LATEST RULES, REGULATIONS AND DEFINITIONS OF THE CANADIAN ELECTRICAL CODE, APPLICABLE MUNICIPAL AND PROVINCIAL CODES AND REGULATIONS AND WITH REQUIREMENTS OF OTHER AUTHORITIES HAVING JURISDICTION IN THE AREA WHERE WORK IS TO BE PERFORMED.

2. STANDARDS ESTABLISHED BY DRAWINGS AND SPECIFICATIONS SHALL NOT BE REDUCED BY ANY CODES REFERRED TO ABOVE AND MINOR CHANGES REQUIRED BY AN AUTHORITY HAVING JURISDICTION SHALL BE PERFORMED WITHOUT CHANGE TO THE CONTRACT AMOUNT.

3.3 SAFETY REQUIREMENTS

1. CLEAN SITE AT REGULARLY SCHEDULED TIMES. LEAVE WORK CLEAN BEFORE INSPECTION PROCESS COMMENCES.

2. DO NOT LEAVE THE SITE IN DANGEROUS CONDITIONS, UNDER ANY CIRCUMSTANCES, DURING THE PROGRESS OF WORK.

3.4 CO-OPERATION AND RESPONSIBILITY

1. INCLUDE FULL RESPONSIBILITY FOR LAYOUT OF ELECTRICAL WORK, FOR DAMAGE CAUSED TO OTHER DIVISIONS OF WORK BY REASON OF IMPROPER LOCATION OR INSTALLATION OF WORK IN ADVANCE OF CONCRETE POURING OR SIMILAR WORK, FOR CONDITIONS OF ALL MATERIAL AND EQUIPMENT SUPPLIED UNDER THIS DIVISION AND FOR PROTECTION AND MAINTENANCE OF WORK COMPLETED AND ACCEPTED UNTIL TERMINATION OF CONTRACT.

2. CO-OPERATE WITH OTHER DIVISIONS TO ENSURE THAT ITEMS INSTALLED UNDER THIS DIVISION ARE LOCATED IN PROPER RELATION WITH BUILDING CONSTRUCTION, ARCHITECTURAL FINISHES AND WITH OTHER EQUIPMENT OR APPARATUS.

3.5 GUARANTEE

1. GUARANTEE MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE BY ENGINEER, EXCEPT FOR INCANDESCENT LAMPS WHICH SHALL BE GUARANTEED FOR A PERIOD OF 90 DAYS FROM DATE OF FINAL ACCEPTANCE. ALL DEFECTS SHALL BE CORRECTED AND MADE GOOD DURING THIS PERIOD EXCEPT DEFECTS OCCURRING FROM MISUSE BY OWNER.

3.6 PERMITS FEES AND CERTIFICATES

1. FILE CONTRACT DRAWINGS WITH PROPER AUTHORITIES AND OBTAIN APPROVAL OF INSTALLATION AND PERMITS FOR THE WORK. PREPARE AND SUBMIT NECESSARY DETAIL SHOP DRAWINGS AS REQUIRED BY AUTHORITIES.

2. PAY ALL FEES IN CONNECTION WITH EXAMINATION OF DRAWINGS, FOR PERMITS, INSPECTIONS AND FINAL CERTIFICATES OF APPROVAL.

3. SUPPLY NECESSARY CERTIFICATES AS EVIDENCE THAT WORK AS INSTALLED CONFORMS WITH LAWS AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION.

3.7 EQUIPMENT SHOP DRAWINGS

1. PREPARE AND SUBMIT A MINIMUM OF SIX SHOP DRAWINGS OF ALL MAJOR ITEMS OF EQUIPMENT PRIOR TO EQUIPMENT FABRICATION, DELIVERY OR INSTALLATION. SHOP DRAWINGS SHALL INDICATE MANUFACTURER, CATALOGUE NUMBER, DIMENSIONS, SPECIAL FEATURES OR FINISHES.

2. SUBMIT SHOP DRAWING WITHIN (7) DAYS OF AWARD OF CONTRACT.

3. THE OWNER RESERVES THE RIGHT TO WAIVE APPROVAL DRAWINGS AND ACCEPT RECORD DRAWINGS, THIS IN NO WAY RELIEVES THE CONTRACTOR FROM SUPPLYING THE SPECIFIC EQUIPMENT.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING ALL SHOP DRAWINGS FOR ERRORS OR OMISSIONS TO CONFORM WITH ACCURACY REQUIREMENTS OF DIMENSIONS TO CONFORM WITH SITE CONDITIONS AND FOR INFORMATION THAT PERTAINS SOLELY TO EQUIPMENT FABRICATION PROCESSES.

3.8 AS BUILT DRAWINGS

1. THE CONTRACTOR SHALL MAINTAIN ON SITE ONE SET OF UP TO DATE AS BUILT DRAWINGS FOR REVIEW AT ALL TIMES. AT THE END OF THIS CONTRACT THE CONTRACTOR SHALL SUPPLY THE OWNER A COMPLETE SET OF AS BUILT DRAWINGS FOR HIS REVIEW AND ACCEPTANCE.

2. PROVIDE THREE (3) OPERATIONS AND MAINTENANCE MANUALS IN 3 POST BACK BINDER AT COMPLETION OF THE PROJECT. MANUALS SHALL CONTAIN A LIST OF SUPPLIERS INCLUDING TELEPHONE NUMBERS, SHOP DRAWINGS, FINAL ELECTRICAL INSPECTION CERTIFICATE, FIRE ALARM VERIFICATION, RECORD DRAWINGS, AND TEST REPORTS. EACH SECTION SHALL BE SEPARATELY TABBED. EACH PIECE OF EQUIPMENT REQUIRING ADJUSTMENT OR REGULAR MAINTENANCE SHALL HAVE CLEAR INSTRUCTIONS TO HOSE REQUIREMENTS.

3.9 COMPLETION

1. LEAVE ALL NEW AND RELOCATED EQUIPMENT CLEAN, FREE OF CONSTRUCTION DEBRIS AND OTHER FOREIGN MATTER. REMOVE ANY TEMPORARY OR PROTECTIVE COATINGS.
2. UPON COMPLETION OF THE WORK THE CONTRACTOR SHALL PROVIDE IN A TIMELY FASHION "AS BUILT" DRAWINGS, LETTER OF WARRANTY, OWNERS MANUAL AND WORKERS COMPENSATION CLEARANCE CERTIFICATE.

3.10 EQUIPMENT LOCATIONS

1. THE RIGHT IS RESERVED TO ALTER THE LOCATION OF EQUIPMENT AND OUTLETS AT DISTANCE OF UP TO TEN FEET (3 METERS) WITHOUT INVOLVING A CHANGE TO THE CONTRACT AMOUNT, PROVIDED NOTICE IS GIVEN PRIOR TO INSTALLATION OF SAME.

3.11 CONTRACT DRAWINGS

1. THESE DRAWINGS ARE INTENDED TO SERVE AS A GUIDE SHOWING QUANTITIES AND GENERAL ARRANGEMENTS AND ARE NOT NECESSARILY WORKING DRAWINGS FROM WHICH MEASUREMENTS CAN BE TAKEN, EXCEPT WHERE DIMENSION FIGURES ARE SPECIFICALLY SHOWN. INFORMATION INVOLVING ACCURATE MEASUREMENTS OF BUILDING SHALL BE TAKEN FROM BUILDING DRAWING OR FROM THE SITE.

3.12 MATERIAL

1. MATERIALS SUPPLIED BY THIS CONTRACTOR SHALL BE NEW, OF CANADIAN MANUFACTURE WHERE AVAILABLE AND OF FIRST QUALITY AND UNIFORM THROUGHOUT.
2. ALL ELECTRICAL MATERIALS SHALL BE CSA APPROVED AND LABELED AND ALL MATERIALS NOT APPROVED SHALL RECEIVE ACCEPTANCE FOR INSTALLATION BY SPECIAL APPLICATION TO CSA. MATERIAL SHALL NOT BE INSTALLED OR CONNECTED TO A SOURCE OF ELECTRICAL POWER UNTIL APPROVAL IS OBTAINED.

3.13 RETURN OF DRAWINGS

1. AT THE COMPLETION OF THE JOB, ALL DRAWINGS SHALL BE RETURNED, REGARDLESS OF THEIR CONDITION.

3.14 PLANS FOR RECORDING CHANGES

1. OBTAIN ONE SET OF WHITE PRINTS AND RECORD ON ANY ALTERATIONS OF THE ROUTING OF CONDUIT, WIRING AND ETC., OR SHOW ON THE CONTRACT DRAWINGS. THESE DRAWINGS TO BE KEPT UP TO DATE AND TURNED OVER AT THE COMPLETION OF THE PROJECT.

3.15 CLEANING UP

1. ALL REFUSE AND DEBRIS CAUSED BY THIS CONTRACTOR SHALL BE REMOVED FROM THE SITE AT FREQUENT INTERVALS. BEFORE THE WORK IS FINALLY ACCEPTED BY THE OWNER, THIS CONTRACTOR SHALL THOROUGHLY CLEAN ALL EQUIPMENT, APPARATUS AND FIXTURES AND LEAVE THEM IN PERFECT NEW CONDITION.

3.16 INSTRUCTIONS TO OPERATORS

1. INSTRUCT THE OWNER'S OPERATOR IN THE CARE AND MAINTENANCE AND OPERATION OF ALL ELECTRICAL SYSTEMS AND EQUIPMENT INSTALLED UNDER THE SPECIFICATION.

2. PREPARE THREE COPIES OF OPERATIONS AND MAINTENANCE INSTRUCTIONS, SHOP DRAWINGS, WIRING DIAGRAMS, DESCRIPTIVE LITERATURE FOR EACH ITEM OF EQUIPMENT SUPPLIED. COMBINE THESE TOGETHER IN LOOSE LEAF BINDERS.

3. THESE LOOSE LEAF BINDERS SHALL BE PRESENTED UPON COMPLETION OF THE PROJECT.

3.17 NAMEPLATES

1. ALL APPARATUS SHALL HAVE PROPER NAME PLATES AFFIXED THERETO, SHOWING SERIAL NUMBER, SIZE, NAME OF EQUIPMENT AND ALL INFORMATION USUALLY SUPPLIED, INCLUDING VOLTAGE, PHASE, HERTZ AND HORSEPOWER OF MOTORS AND THE NAME OF THE MANUFACTURER AND THEIR ADDRESS.

3.18 INSPECTIONS AND TESTING

1. ALL WORK SHALL BE LEFT OPEN FOR INSPECTION SO THAT INSPECTION MAY BE MADE BEFORE THE WORK IS COVERED.

3.19 LOAD BALANCE

1. MEASURE PHASE CURRENT TO PANEL BOARDS WITH NORMAL LOADS OPERATING AT THE TIME OF ACCEPTANCE. ADJUST BRANCH CIRCUIT CONNECTIONS AS REQUIRED TO OBTAIN BEST BALANCE OF CURRENT BETWEEN PHASES.

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All measurements must be checked on site by the contractor prior to construction or fabrication.

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This drawing is not to be used for construction unless stamped and signed by the Engineer.

Stamp
REGISTERED PROFESSIONAL ENGINEER
J. DOUGLAS MATHESON
No. 380
PROVINCE OF PRINCE EDWARD ISLAND

Scale: NO SCALE
Date: NOVEMBER 21, 2019
Drn By: BCJP
Chk'd By: MA
Project No. 19-175

QEH NEW AIR HANDLING UNIT

Sheet Title: SPECIFICATIONS