

1. GENERAL PROVISION

- SUPPLY AND INSTALL A COMPLETE AND OPERATIONAL SYSTEM AS INDICATED AND/OR SPECIFIED DRAWINGS ARE NOT TO BE SCALED AND ARE INTENDED AS SCHEMATIC ONLY. VISIT SITE PRIOR TO SUBMISSION OF BID AND EXAMINE ALL EXISTING CONDITIONS. NOTIFY ENGINEER OF DISCREPANCIES, CONFLICTS AND AREAS OF CONCERN.
- ALL WORK SHALL CONFORM TO THE LATEST CODE REQUIREMENTS OF THE ONTARIO BUILDING CODE, FIRE MARSHALS ACT, MUNICIPAL BYLAWS AND AUTHORITIES HAVING JURISDICTION. THE INSTALLATION SHALL BE IN ACCORDANCE TO THE STANDARDS OF THE C.S.A., C.G.A. AND U.L.C.. FOLLOW ALL RECOMMENDATIONS OUTLINED BY THE MANUFACTURER. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE AFOREMENTIONED CODES AND STANDARDS WITH THE INSTALLATION PERFORMED ONLY BY CONTRACTORS LICENSED AND FAMILIAR WITH THE ABOVE REQUIREMENTS.
- PAY AND OBTAIN ALL REQUIRED PERMITS, FEES, INSPECTIONS AND LICENSES. SUBMIT DRAWINGS TO AUTHORITIES AS REQUIRED.
- ALL MATERIALS AND EQUIPMENT TO BE NEW AND FREE FROM DEFECTS. GUARANTEE IN WRITING, INCLUDING THE MANUFACTURER'S WARRANTY, THE MATERIAL AND WORKMANSHIP, FOR A PERIOD OF ONE YEAR AFTER BUILDING ACCEPTANCE BY THE ENGINEER AND THE OWNER.
- THE MECHANICAL TRADE SHALL SUPPLY ALL ACCESS DOORS AND COVERS FOR INSTALLATION BY GENERAL TRADES FOR CONCEALED VALVES, CLEANOUTS, AIR VENTS, FIRE DAMPERS, BALANCING DAMPERS AND EQUIPMENT, REQUIRING PERIODIC MAINTENANCE OR ADJUSTMENT. OBTAIN APPROVAL FROM THE ARCHITECT AND ENGINEER FOR ALL LOCATIONS AND SIZES.
- KEEP SITE CLEAN AT ALL TIMES AND PHASE WORK WITH PROJECT CO-ORDINATOR. CLEAN ALL EQUIPMENT, PROVIDE INITIAL MAINTENANCE, START-UP AND FILTER REPLACEMENT PRIOR TO FINAL INSPECTION.
- SUBMIT SIX(6) COPIES OF SHOP DRAWINGS FOR ALL EQUIPMENT PRIOR TO ORDERING. PROVIDE 3 MAINTENANCE MANUALS C/W APPROVED COPY OF ALL SHOP DRAWINGS, MARKED UP WHITE PRINT SHOWING AS-BUILT RECORD CONDITION AND AIR BALANCE REPORT TO ENGINEER.
- VISIT AND INSPECT THE SITE. NO ALLOWANCE WILL BE MADE FOR FAILURE TO DO SO.
- COOPERATE WITH ALL OTHER TRADES. CO-ORDINATE ALL WORK.
- IDENTIFY ALL EQUIPMENT WITH LAMACOID NAMEPLATES SECURELY FASTENED.
- MECHANICAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ARCHITECTURAL, STRUCTURAL & ELECTRICAL NECESSARY FOR THE COMPLETION OF THE WORK IN THE PROPER MANNER SHALL BE DEEMED RESPONSIBLE FOR CO-ORDINATION OF ALL TRADES, TO ENSURE AN ORDERLY AND COMPLETE INSTALLATION.
- ANY WORK NOT SHOWN ON THE DRAWINGS OR SPECIFICALLY MENTIONED IN THE SPECIFICATIONS, BUT CONSIDERED NECESSARY FOR THE COMPLETION OF THE WORK IN THE PROPER MANNER, SHALL BE PROVIDED BY THIS CONTRACTOR AT NO ADDITIONAL CHARGE.
- NOTHING CONTAINED HEREIN SHALL BE CONSTRUED TO RELIEVE THIS CONTRACTOR FROM MAKING GOOD AND PERFECT IN ALL USUAL DETAILS OF CONSTRUCTION AND HE WILL BE HELD RESPONSIBLE TO PROVIDE AND FURNISH MATERIAL, TO DO ALL WORK AND LABOUR, AND BEAR EXPENSES INCIDENTAL TO THE SATISFACTORY COMPLETION OF THE WORK EMBRACED IN THESE SPECIFICATIONS.
- VERIFY VOLTAGE WITH ELECTRICAL CONTRACTOR ON SITE, FOR ALL EQUIPMENT, BEFORE PLACEMENT OF ORDER.
- MECHANICAL CONTRACTOR SHALL CONFIRM EXACT LOCATION OF ALL EXISTING MECHANICAL SERVICES & EQUIPMENT.
- MECHANICAL CONTRACTOR SHALL PROVIDE TO THE OWNER, 3 BOUND SETS OF OPERATING AND MAINTENANCE INSTRUCTIONS FOR ALL
- IT IS THE RESPONSIBILITY OF THIS CONTRACTOR TO TEST AND COMMISSION THE HVAC SYSTEMS AND PROVIDE REPORT TO THE ENGINEER.

2. HVAC

- FOLLOW INSTALLATION STANDARDS TO LATEST EDITION OF SMACNA AND ASHRAE, RECTANGULAR DUCTWORK TO BE FABRICATED FROM CROSS-BROKEN GALVANIZED STEEL SHEETS WITH THICKNESS AS DETAILED IN SMACNA STANDARDS. FABRICATE DUCTWORK IN A WORKMANLIKE MANNER. ALL JOINTS TO BE SEALED WITH LIBERAL APPLICATION OF DURO-DYNE S-2 DUCT SEALER.
- BRACE DUCT IN MANNER SO THAT IT DOES NOT SAG OR VIBRATE WHEN FANS ARE OPERATING AT HIGH SPEED OR STOPPING AND STARTING.
- PRIOR TO FABRICATION, FIELD MEASURE DUCT FOR CONFLICT TO STRUCTURAL MEMBER, LIGHTING AND PLUMBING. REPORT DISCREPANCIES TO THE ENGINEER.
- INSTALL BALANCING DAMPERS AS SHOWN AND REQUIRED FOR BALANCING OF THE SYSTEM. INSTALL TURNING VANES IN SQUARE ELBOWS.
- WALL CAPS AND BRICK VENTS TO HAVE INSECT SCREENS AND FREE OPERATING BACKDRAFT DAMPERS.
- SECURE ALL FANS AND EQUIPMENT TO STRUCTURE WITH SUSPENSION RODS WITH SPRING ISOLATORS TO PROVIDE QUIET AND RATTLE-FREE OPERATION. DUCTWORK TO FAN CONNECTIONS TO BE MADE WITH FLEXIBLE FABRIC CONNECTORS.
- PROVIDE START-UP OF SYSTEM AND CO-ORDINATE WITH OTHER TRADES. SUBMIT THREE COPIES OF AIR BALANCE REPORT, MAINTENANCE DATA AND LIST OF SERVICES PERFORMED DURING START-UP TO ENGINEER PRIOR TO FINAL ACCEPTANCE.
- PROVIDE DYNAMIC FIRE DAMPERS WITH WALL SLEEVE, BREAKAWAY JOINTS, DUCT ACCESS DOOR AND ANGLE IRON ASSEMBLY FRAME ON BOTH SIDES OF WALL. REFER TO DRAWINGS FOR SIZES AND LOCATION. ALL FIRE DAMPERS SHALL BE OUT OF AIRSTREAM TYPE.
- MECHANICAL CONTRACTOR SHALL COORDINATE INSTALLATION OF ALL DUCTWORK WITH CEILING AND ROOF FRAMING MEMBERS. (H.V.A.C. TRADE)
- EQUIVALENT DUCT SIZES MAY BE SUBSTITUTED, IN LIEU OF THOSE SHOWN, IN ORDER TO AVOID INTERFERENCE WITH THE STRUCTURAL MEMBERS. OBTAIN ENGINEER'S APPROVAL BEFORE FABRICATION.
- INSTALL TURNING VANES IN ALL 90 DEGREE DUCT ELBOWS. (SUPPLY AIR SYSTEMS, AND RETURN AIR SYSTEM ONLY WHERE SHOWN).
- INSTALL SPIN-IN DUCT COLLARS, COMPLETE WITH BALANCING DAMPERS, AT ALL ROUND BRANCH DUCT TAKE-OFFS.
- FLEXIBLE DUCTWORK IS PERMISSIBLE IN LAY-IN TYPE CEILINGS ONLY. MAXIMUM LENGTH OF FLEXIBLE DUCT WORK SHALL BE 5.0 FT.
- SUPPLY AND INSTALL REGISTERS AND DIFFUSERS WHERE SHOWN ON THE DRAWINGS. SIZES AS NOTED. TYPES AS SPECIFIED HEREIN. FINISHES SHALL MATCH CEILINGS WHERE INSTALLED.
- THERMOSTATS (UNDER 50V): THERMOSTATS SHALL BE INSTALLED AND WIRED BY DIVISION 15. ALL THERMOSTATS, IN PUBLIC AREA, SHALL BE PROTECTED WITH STURDY METAL TAMPER PROOF, KEY OPERATED COVERS. EXPOSED CONTROL WIRING TO BE RUN IN CONDUIT. PERPENDICULAR OR PARALLEL TO BUILDING LINES.
- PITOT TUBE TEST HOLES:
 - PROVIDE TEST OPENINGS IN ALL DUCTWORK AT ALL FAN DISCHARGES, AT ALL MAJOR BRANCH DUCTS AND RUN-OUTS OR WHERE REQUIRED TO BALANCE THE SYSTEM.
 - DO NOT LOCATE HOLES CLOSER THAN 2 FEET FROM ELBOWS. SPACE OPENINGS EVERY 6" ACROSS THE AIR STREAM. PROVIDE NEOPRENE PLUGS FOR TEST OPENINGS.

3. AIR BALANCING

- HVAC CONTRACTOR SHALL INCLUDE FOR ALL BALANCING WORK AND RELATED ACTIVITIES.
- ALL INLETS, OUTLETS, GRILLES, DIFFUSERS AND REGISTERS SHALL BE ADJUSTED AND A REPORT PREPARED AND SUBMITTED (3 COPIES; RING BINDER; SCHEMATICS).
- THE AIR BALANCING CONTRACTOR SHALL INCLUDE FOR ALL RELATED ACTIVITIES FOR VERIFICATION OF THE HVAC SYSTEM, INCLUDING SUPPLY, RETURN AND FRESH AIR VOLUMES.
- THE AIR BALANCING CONTRACTOR SHALL INCLUDE FOR ALL RELATED ACTIVITIES FOR VERIFICATION OF ALL EXHAUST FANS AND RELATED GRILLES.
- BALANCE TO ACHIEVE MINIMUM STATIC PRESSURE DROPS COMPATIBLE WITH THE SYSTEM.

4. INSULATION

- DUCTWORK (THERMAL)
 - INSULATE ALL A/C DUCTWORK WHERE SHOWN WITH 1" FIBREGLASS INSULATION AND ANTI-SWEAT VAPOUR BARRIER. INSULATE ALL EXTERIOR DUCT WORK WITH 2" FIBREGLASS INSULATION AND "RFRK" VAPOUR BARRIER C/W 2 LAYERS OF WATERPROOFING. INSULATE ALL EXHAUST OR FRESH AIR DUCTWORK PASSING THROUGH AN EXTERIOR WALL OR ROOF 10'-0" BACK FROM WALL WITH 2" FIBREGLASS INSULATION AND ANTI-SWEAT VAPOUR BARRIER.
- DUCT WORK (ACOUSTIC)
 - PROVIDE 1" THICK RIGID FIBREGLASS WITH A DENSITY OF 2LBS/CU.FT WHERE SHOWN & FOR 10' OF ALL SUPPLY AND RETURN DUCT FROM MECHANICAL UNITS. COAT THE EXPOSED SURFACE WITH BLACK NEOPRENE COMPOUND. LINER TO BE GLUE AND SCREW FASTENED WITH METAL EDGING. DUCT SIZE NOTED ON DRAWING INDICATES FREE AREA REQUIRED. INCREASE DUCTWORK SIZE AS NECESSARY TO MAINTAIN FREE AREA NOTED.
- ALL EXPOSED DUCTWORK & PIPING INSULATION SHALL HAVE VENTURE CLAD PVC COVERING.
- THERMAL INSULATION REQUIRED ON SUPPLY AND RETURN DUCTWORKS ENCLOSED IN SHAFT.
- ALL COMBUSTIBLE COVERINGS AND LININGS, INCLUDING ASSOCIATED ADHESIVE AND INSULATION SHALL HAVE FLAME-SPREAD RATING OF NOT MORE THAN 25 AND SMOKE DEVELOPED CLASSIFICATION OF NOT MORE THAN 50.

5. SEISMIC RESTRAINT SYSTEM

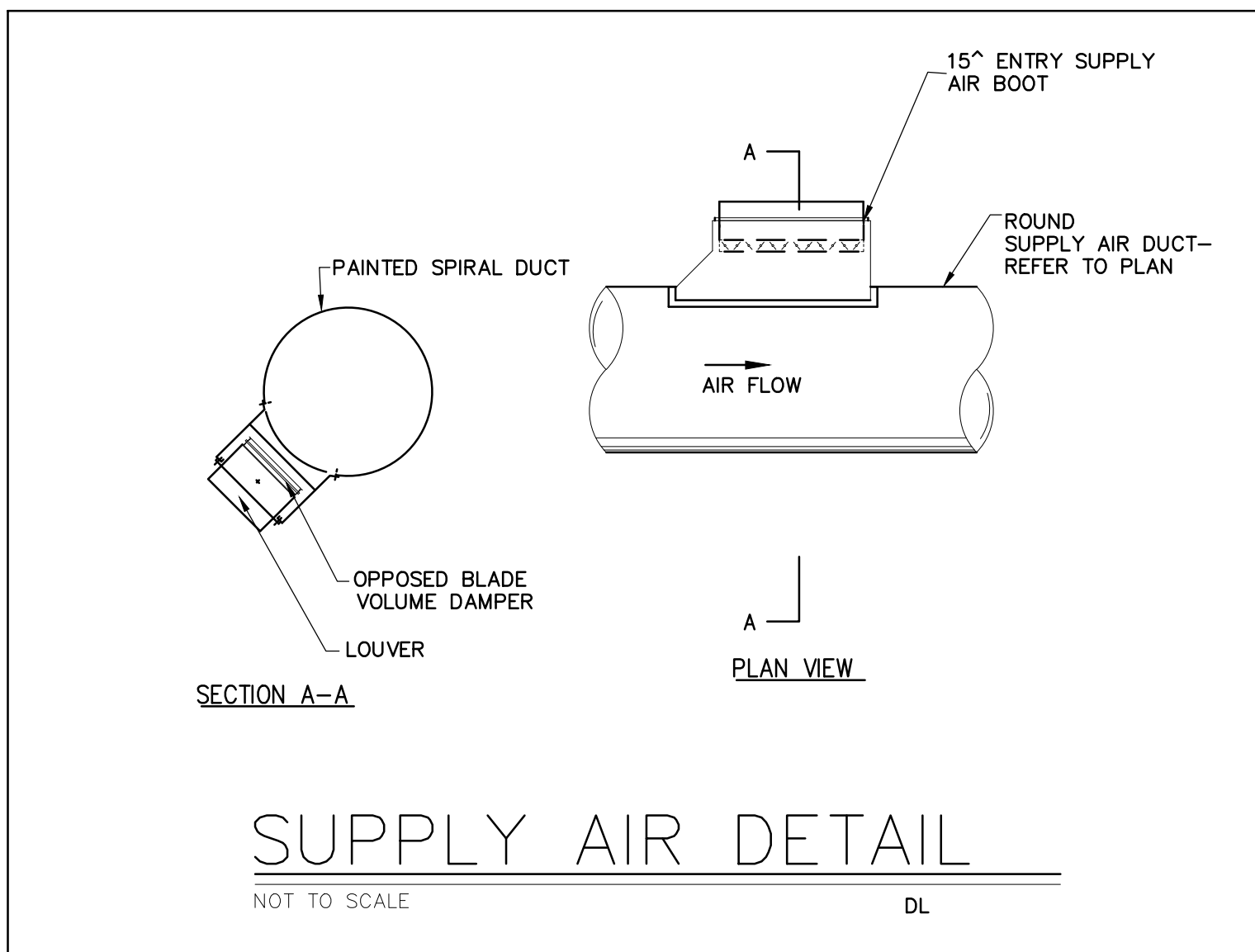
- EACH TRADE SHALL BE RESPONSIBLE FOR ALL APPLICABLE SEISMIC RESTRAINT SYSTEMS FOR ALL SYSTEMS AND EQUIPMENT FORMING PART OF THEIR RESPECTIVE CONTRACTS. ALL TRADES SHALL COORDINATE SRS DESIGN AND IMPLEMENTATION.
- DESIGN TO BE BY PROFESSIONAL ENGINEER SPECIALIZING IN DESIGN AND REGISTERED IN THE PROVINCE.

VENTILATION (HVAC) TRADE SCOPE

VENTILATION (HVAC) CONTRACTOR SHALL PROVIDE THE FOLLOWING: (PROVIDE MEANS, SUPPLY & INSTALL UNLESS SPECIFICALLY NOTED OTHERWISE).

PROVIDE:

- MECHANICAL (HVAC) COORDINATION AND INTERFERENCE DRAWING
- SUPPORTS FOR ROOFTOP DUCTWORK, EQUIPMENT AND RELATED REFRIGERATION PIPING
- ALL NECESSARY SLEEVING FOR DUCTWORK, EQUIPMENT AND RELATED REFRIGERATION PIPING. ALL NECESSARY CO-ORDINATION, SIZING AND LAYOUT FOR LARGE OPENINGS FOR DUCTWORK, EQUIPMENT AND RELATED REFRIGERATION PIPING REQUIRED TO PENETRATE THROUGH NEW REINFORCED CONCRETE WALLS AND SLABS.
- MECHANICAL (HVAC) COMMISSIONING, AS-BUILT DRAWINGS AND OPERATION AND MAINTENANCE DRAWINGS AND MANUALS AS SPECIFIED.
- COMPLY WITH CODES AS SPECIFIED.
- HANGERS AND SUPPORTS FOR DUCTWORK SYSTEMS.
- BEYOND THE SPECIFIED CONTRACT FULL WARRANTY (CCA), THE EXTENDED WARRANTY(IES) ARE LIMITED TO THE TERMS OF THE MANUFACTURERS WARRANTY(IES).
- TRADE CLEAN-UP - SEE OCA RECOMMENDED DAY TO DAY CLEAN UP STANDARD OF PRACTICE.
- HOISTING FOR MECHANICAL (HVAC) MATERIALS AND EQUIPMENT.
- SCAFFOLDING AND ACCESS EQUIPMENT AS REQUIRED FOR MECHANICAL (HVAC) WORK.
- DESIGN, SUPPLY AND INSTALLATION OF VIBRATION ISOLATION AND SEISMIC RESTRAINT FOR MECHANICAL (HVAC) SYSTEMS.
- MECHANICAL (HVAC) IDENTIFICATION.
- TESTING, ADJUSTING AND AIR BALANCING (TAB) OF MECHANICAL (HVAC) SYSTEM.
- ALL STEEL BASES AND STEEL SUPPORTS FOR MECHANICAL (HVAC) EQUIPMENT WHEN SPECIFIED OR DETAILED ONLY ON MECHANICAL (HVAC) DRAWINGS AND SPECIFICATIONS.
- SUPPLY ACCESS DOOR(S) WHEN REQUIRED BY MECHANICAL (HVAC).
- FIRE STOPPING FOR MECHANICAL (HVAC) SYSTEMS.
- MECHANICAL (HVAC) PERMITS AND INSPECTION FEES.
- MECHANICAL (HVAC) CONNECTIONS TO SPECIALTY EQUIPMENT WHICH IS SUPPLIED AND INSTALLED BY OTHERS.
- SHEET METAL AND NON-METALLIC AIR HANDLING DUCTWORK, SHEET METAL PLENUMS AND CASINGS INCLUDING HANGERS AND SUPPORTS
- ALL AIR MOVING EQUIPMENT SPECIFIED IN MECHANICAL DRAWINGS AND SPECIFICATIONS.
- ALL DAMPERS EXCEPT WHERE SUPPLIED BY OTHERS.
- ACOUSTIC DUCTWORK LINING.
- WEATHER LOUVERS COMPLETE WITH BIRD SCREEN AND BLANK-OFF PANELS.
- GRAVITY RELIEF VENTS AND INTAKES AND ROOF HOODS WHEN SPECIFIED OR DETAILED ON MECHANICAL DRAWINGS AND SPECIFICATIONS.
- TERMINAL BOXES AND AIR VALVES INCLUDING COILS.
- ALL HVAC RELATED FILTERS.
- REGISTERS, GRILLES, DIFFUSERS.
- SUPPLY AND/OR INSTALLATION OF DOOR GRILLES WHERE SPECIFIED.
- COUNTER FLASHING FOR HVAC EQUIPMENT.
- PACKAGED AND SELF-CONTAINED HEATING AND COOLING AIR CONDITIONING UNITS.
- MECHANICAL (HVAC) INSULATION.



6. MECHANICAL EQUIPMENT

EXHAUST FAN EF:
CEILING FAN, 115 CFM @ 0.15" , 1.5 SONS EQUAL TO REVERSOMATIC MODEL EB100S

SINGLE DUCT TERMINALS (VAV BOX)

- TO MATCH WITH THE EXISTING. REFER TO EXISTING MECHANICAL DRAWING.
- EH PRICE #SDV08CW CONTROLS C/W FAN SWITCH AND HOT WATER COIL.
- CHOICE OF RIGHT OR LEFT HAND CONTROL LOCATION. STANDARD DUAL DENSITY INSULATION. CONTROLS SUPPLIED BY EH PRICE.
- REGULATE AIRFLOW TO ZONES, AIRFLOW SWITCH, CLASS II, 24 VOLT CONTROL TRANSFORMER.

VAV SCHEDULE				
TERMINAL BOX NO.	SIZE	AIR FLOW (CFM)	MIN. AIR FLOW (CFM)	HOT WATER COIL
VAV-5	4	330	100	3/4" HWS & HWR,
VAV-6	6	480	100	3/4" HWS & HWR,
VAV-7	10	1280	200	3/4" HWS & HWR,

GRILLES & DIFFUSERS SCHEDULE		
TYPE	MODEL	DESCRIPTION
S1	E.H. PRICE # SPD	ADJUSTABLE SQUARE CEILING DIFFUSER (24"X24") MATCH WITH EXISTING
S2	E.H. PRICE # 520D-F	DOUBLE DEFLECTION SUPPLY GRILLE C/W BD MATCH WITH EXISTING
S3		
S4	E.H. PRICE # AS210/1/B12	COSTUME FLOW LINEAR-SLOT SUPPLY DIFFUSER WITH ENGINEERED PLENUM, 6"Ø, 48" LONG
R1	E.H. PRICE # 530D-F	LOUVERED FACE RETURN MATCH WITH EXISTING
R2	E.H. PRICE # 80D	EGG CRATE RETURN
R3	E.H. PRICE # AS210/1/B12	COSTUME FLOW LINEAR-SLOT RETURN 6" LONG
R4		STEEL FRAMED WIRE MESH 1"X1"

Noise and vibration Control
HVAC
1. Provide flex connection between fans and furnace and ducts. Provide rigid support for duct within 1' of flex connection.

REVIEW OF SHOP DRAWINGS
SHOP DRAWINGS MUST BE REVIEWED AND STAMPED BY BOTH SUB-CONTRACTOR AND GENERAL CONTRACTOR.
REVIEW BY ENGINEER IS ONLY FOR THE VERIFICATION OF GENERAL QUALITY AND DESIGN AND DOES NOT RELIEVE THE CONTRACTOR FROM HIS RESPONSIBILITY FOR ENSURING THAT ALL SPACES, CAPACITIES, SPECIFICATION COORDINATION, INSTALLATION AND CONTRACTUAL REQUIREMENTS ARE MET.

MECHANICAL LEGEND	
	NEW DUCT
	DUCT C/W ACOUSTIC LINING
	BALANCING DAMPER
	BRANCH CONNECTION WITH BALANCING DAMPER
	FIRE DAMPER
	CEILING DIFFUSER
	WALL SUPPLY GRILLE OR WALL CAP
	WALL EXHAUST/RETURN GRILLE
	RETURN GRILLE
	RETURN AIR EGGCRATE
	CEILING EXHAUST FAN
	DUCT TRANSITION
	A = TYPE (SEE DWGS OR SPECS) B = SIZE OF GRILLE REGISTER OR DIFFUSER NECK CONNECTION C = CAPACITY FOR EACH (CFM)
	THERMOSTAT
EX	DENOTES EXISTING TO REMAIN
REL	DENOTES RELOCATE TO NEW LOCATION
R/D	DENOTES ITEM BEING RELOCATED TO NEW LOCATION
REM	DENOTES ITEM TO BE REMOVED



NO.	DATE	REVISION	NAME
2	SEP. 20, 2018	PRICE	MY
1	SEPT. 7, 2018	BUILDING PERMIT	MY

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PROFESSIONAL ENGINEER
M. YAZDANI
SEPT. 7, 2018
PROVINCE OF ONTARIO

PROJECT
NORTRAX OTTAWA
UPPER LEVEL FIT-UP
190 DAVID MANCHESTER RD., OTTAWA, ON

DRAWING
HVAC
SPECIFICATIONS

PROJECT NUMBER

CREATED BY MY DESIGNED BY MY

DRAWN BY SY CHECKED BY JONE

DATE

REVISION

M-4