























































































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HEATING, VENTILATION AND AIR CONDITIONING											
ABBREVIATIONS			AIR DEVICES AND COMPONENTS			PIPING SPECIALTIES		PIPING DESIGNATIONS		HVAC GENERAL NOTES	
A ABOVE ACU AIR CONDITIONING UNIT AFF ABOVE FINISHED FLOOR AFH ABOVE FINISHED GRADE AHU AIR HANDLING UNIT AMP AMPERES APPROX APPROXIMATE ARCH ARCHITECTURAL ASME AMERICAN SOCIETY OF MECH ENG ATC AUTOMATIC TEMPERATURE CONTROL AUTO AUTOMATIC B BDD BACK DRAFT DAMPER BE BOTTOM ELEVATION BFG BELOW FINISHED GRADE BJ BETWEEN JOISTS BLDG BUILDINGS BLW BELOW BOD BOTTOM OF DUCT BOT BOTTOM BTU BRITISH THERMAL UNIT C C CONVECTOR CFM CUBIC FEET PER MINUTE CLG CEILING CO CLEANOUT COD CENTER OF DUCT CONC CONCRETE COND CONDENSATE/CONDENSING CONN CONNECT/CONNECTION CONST CONSTRUCTION/CONSTRUCTION COORD COORDINATE CR STEAM CONDENSATE RETURN CRACU COMPUTER ROOM ACU CU CONDENSING UNIT CUH CABINET UNIT HEATER CV CHECK VALVE CW COLD WATER CWR CHILLED WATER RETURN CWS CHILLED WATER SUPPLY D DB DRY BULB DD DUCT SMOKE DETECTOR DEPT DEPARTMENT DIA DIAMETER DISC DISCONNECT DN DOWN DR DRAIN DR DUCT RISER DS DUCT SILENCER DSU DUCTLESS SPLIT SYSTEM UNIT DWG DRAWING E EA EXHAUST AIR EAT ENTERING AIR TEMPERATURE EC ELECTRICAL CONTRACTOR EDB ENTERING DRY BULB TEMPERATURE EF EXHAUST FAN EL ELEVATION ELEC ELECTRICAL EMER EMERGENCY ENCL ENCLOSURE EQUIP EQUIPMENT ERU ENERGY RECOVERY UNIT ESP EXTERNAL STATIC PRESSURE ETR EXISTING TO REMAIN EWB ENTERING WET BULB TEMPERATURE EWT ENTERING WATER TEMPERATURE EXH EXHAUST/EXHAUSTER EXIST EXISTING EXP EXPOSED F F FAHRENHEIT FD FIRE DAMPER FLA FULL LOAD AMPERES FLEX FLEXIBLE	FLR FLOOR PPM FEET PER MINUTE FT FOOT/FEET FT HD FEET OF HEAD FUT FUTURE G G GROUND GA GAUGE/GAGE GAL GALLON GALV GALVANIC or GALVANIZED GC GENERAL CONTRACTOR GEN GENERAL GPH GALLONS PER HOUR GPM GALLONS PER MINUTE GR GRILLE GRD GRADE H H HIGH HC HEATING (HVAC) CONTRACTOR HDAG HEAVY DUTY ARCHITECTURAL GRILLE HGB HOT GAS BYPASS HORIZ HORIZONTAL HP HORSE POWER HPC HIGH PRESSURE CONDENSATE HPS HIGH PRESSURE STEAM HR HOUR HSTAT HUMIDISTAT HTG HEATING HTG CONCRETE HWR HOT WATER RETURN HWS HOT WATER SUPPLY Hz HERTZ (FREQUENCY) I ID INSIDE DIAMETER IN OR * INCH INT INTERIOR INV (INVERTER) ISP INTERNAL STATIC PRESSURE IWG INCH WATER GAUGE K KW KILOWATT KWH KILOWATT HOURS L LAT LEAVING AIR TEMPERATURE LB or LBS POUNDS(S) LDB LEAVING DRY BULB TEMPERATURE LF LINEAR FEET LPG LOW PRESSURE CONDENSATE LPS LOW PRESSURE STEAM LWB LEAVING WET BULB TEMPERATURE LWC LOW WATER CUT-OFF LWT LEAVING WATER TEMPERATURE M MAU MAKE-UP AIR UNIT MAX MAXIMUM MBH THOUSAND BTU PER HOUR MC MECHANICAL CONTRACTOR MCA MINIMUM CIRCUIT AMPACITY MECH MECHANICAL MFR MANUFACTURER MH MANHOLE MIN MINIMUM MOD MOTOR OPERATED DAMPER (ATC) MPC MEDIUM PRESSURE CONDENSATE MPS MEDIUM PRESSURE STEAM MTD MOUNTED MTG MOUNTING MIZ MULTIZONE N N/A NOT APPLICABLE NC NOISE CRITERIA NC or NC NORMALLY CLOSED NE or NE NORMAL/EMERGENCY POWER NIC NOT IN CONTRACT NO NUMBER NO or NO NORMALLY OPEN NTS NOT TO SCALE	O OA OUTSIDE AIR OAI OUTSIDE AIR INTAKE OC ON CENTER OPNG OPENING P PC PLUMBING CONTRACTOR PD PRESSURE DROP PH PHASE PLBG PLUMBING PR PIPE RISER PRESS PRESSURE PRV PRESSURE REDUCING VALVE/PRESSURE RELIEF VENT PSI POUNDS PER SQUARE INCH PTR PRESSURE TEMPERATURE RELIEF R RAD RADIATION RD ROUND REG REGISTER REL RELIEF AIR RF ROOF RLA RATED LOAD AMPERES RM ROOM RPM REVOLUTIONS PER MINUTE RTU ROOF TOP UNIT RV RELIEF VALVE S SAC STUB & CAP SCD SMOKE CONTROL DAMPER SHT SHEET SP STATIC PRESSURE SPEC SPECIFICATIONS SQ SQUARE STD STANDARD STL STEEL STOR STORAGE SUSP SUSPEND/SUSPENDED SW SWITCH T TD TRANSFER DUCT TDH TOTAL DYNAMIC HEAD TE TOP ELEVATION TEMP TEMPERATURE THRU THROUGH TJ THROUGH JOISTS TSP TOTAL STATIC PRESSURE TSTAT THERMOSTAT TYP TYPICAL U UE UNDER ELECTRICAL UG UNDER GENERAL UH UNIT HEATER, UNDER HVAC UNO UNLESS NOTED OTHERWISE UP UNDER PLUMBING UV UNIT VENTILATOR V VAV VARIABLE AIR VOLUME VD VOLUME DAMPER (MANUAL) VFD VARIABLE FREQUENCY DRIVE VIB VIBRATION ISOLATOR VR VENT RISER VTR VENT THROUGH ROOF W W WATT WI WITH W/O WITHOUT WB WET BULB WG WATER GAUGE WL WEATHER LOUVER WP WEATHERPROOF WPD WATER PRESSURE DROP WT WEIGHT WTD WATER TEMPERATURE DROP WTR WATER TEMPERATURE RISE X XFMR TRANSFORMER	<div><div>SINGLE LINE</div><div>DOUBLE LINE</div></div> <div> SUPPLY/OUTSIDE AIR DUCT</div> <div> RETURN/RELIEF AIR DUCT</div> <div> EXHAUST AIR DUCT</div> <div> SUPPLY/OUTSIDE AIR DUCT ELBOW (UP AND DOWN)</div> <div> RETURN/RELIEF DUCT BELOW (UP AND DOWN)</div> <div> EXHAUST DUCT BELOW (UP AND DOWN)</div> <div> RECTANGULAR OR SQUARE DUCT (SIZE IN INCHES)</div> <div> ROUND DUCT (SIZE IN INCHES)</div> <div> FLAT OVAL DUCT (SIZE IN INCHES)</div> <div> ROUND OR FLAT OVAL DUCT (UP)</div> <div> ROUND OR FLAT OVAL DUCT (DOWN)</div> <div> MITERED ELBOW w/ TURNING VANES</div> <div> RADIUS ELBOW</div> <div> TRANSITION-CONCENTRIC</div> <div> TRANSITION-ECCENTRIC</div> <div> MANUAL VOLUME DAMPER</div> <div> INCLINED RISE(R) OR DROP(D) ARROW IN DIRECTION OF AIR FLOW</div> <div> RECTANGULAR BRANCH TAKE OFF</div> <div> ROUND BRANCH TAKE OFF</div> <div> DUCT-MOUNTED REHEAT COIL</div> <div> FLEXIBLE DUCT</div> <div> FLEXIBLE CONNECTION</div> <div> DUCT SILENCER</div> <div> DUCT ACCESS DOORS</div> <div> SUPPLY DIFFUSER</div> <div> RETURN/REGISTER/GRILLE</div> <div> EXHAUST REGISTER/GRILLE</div> <div> FIRE DAMPER (HORIZONTAL/VERTICAL)</div> <div> SMOKE DAMPER</div> <div> SMOKE CONTROL DAMPER</div> <div> MOTOR OPERATED DAMPER</div> <div> DUCT MOUNTED SMOKE DETECTOR</div> <div> STATIC PRESSURE SENSOR</div> <div> DUCT MOUNTED HUMIDIFIER</div> <div> DUCT MOUNTED PRESSURE SENSOR</div> <div> HVAC CONTROLS</div> <div><div>(L) LETTER IN SYMBOLS INDICATE TYPE : T - TEMPERATURE SENSOR H - HUMIDITY SENSOR TH - TEMPERATURE/HUMIDITY SENSOR WITH TIMECLOCK A - HAND-OFF-AUTO SWITCH CO - COMBINATION CARBON MONOXIDE/NITROGEN OXIDE SENSOR S - MOTOR STARTER DP - DIFFERENTIAL PRESSURE SENSOR DOOR LOUVER, SEE ARCH. DWGS. DOOR UNDERCUT, SEE ARCH. DWGS.</div></div>	<div> PIPE ANCHOR</div> <div> STUB AND CAP</div> <div> PIPE DROP</div> <div> PIPE RISE</div> <div> PIPE TEE OFF BOTTOM</div> <div> REDUCER</div> <div> UNION</div> <div> PRESSURE/TEMPERATURE TEST FITTING</div> <div> ALIGNMENT GUIDE</div> <div> EXPANSION JOINT w/ ALIGNMENT GUIDES</div> <div> FLEXIBLE CONNECTOR</div> <div> EXPANSION COMPENSATOR</div> <div> STRAINER WHOSE END BLOW OFF VALVE</div> <div> PUMP</div> <div> STEAM TRAP</div> <div> AUTOMATIC AIR VENT</div> <div> MANUAL AIR VENT</div> <div> TWO WAY ATC VALVE</div> <div> THREE WAY ATC VALVE</div> <div> BALANCING VALVE</div> <div> BALL VALVE</div> <div> BUTTERFLY VALVE</div> <div> CHECK VALVE</div> <div> DRAIN VALVE</div> <div> SHUT OFF VALVE</div> <div> NEEDLE VALVE</div> <div> PLUG VALVE</div> <div> PRESSURE REDUCING VALVE</div> <div> PRESSURE REGULATOR VALVE</div> <div> PRESSURE RELIEF VALVE</div> <div> SAFETY RELIEF VALVE</div> <div> SOLENOID VALVE</div> <div> STOP CHECK VALVE</div> <div> THROTTLE VALVE</div> <div> BACKFLOW PREVENTER</div> <div> HOT WATER TEMPER VALVE</div> <div> THERMOMETER</div> <div> PRESSURE GAUGE w/ NEEDLE VALVE & SNUBBER (WATER, AIR, GAS)</div> <div> PRESSURE GAUGE WITH SIPHON</div> <div> OS & Y w/ TAMPER SWITCH & FLOW INDICATOR</div> <div> PRESSURE SENSOR</div> <div> OS & Y SUPERVISORY SWITCH</div> <div> FLOW DETECTOR SWITCH</div>	<div><div> NATURAL GAS</div><div> CONDENSATE DRAIN</div></div> <div>GRILLE, REGISTER & DIFFUSER KEY<div> TAG</div><div> BALANCE CFM</div><div> INACTIVE PORTION</div></div> <div>LOUVER KEY<div><div>WL-0x0-000-L</div><div>TAG- WIDTHxHEIGHT (INCHES)</div><div>INTAKE P-EXHAUST R-RELIEF BALANCE CFM</div></div></div> <div>ATC SCHEMATIC COMPONENTS<div> ELECTRIC RESISTANT HEATER</div><div> AIR FLOW MONITORING STATION</div><div> MOD DAMPER WITH END SWITCH</div><div> DIFFERENTIAL PRESSURE SENSOR</div><div> VARIABLE FREQUENCY DRIVE</div></div> <div>GRAPHIC SYMBOLS<div><div>RETURN AIR DESIGNATION</div><div>SUPPLY AIR DESIGNATION</div><div>POINT OF CONNECTION EXISTING SYSTEM</div><div>POINT OF DISCONNECTION FROM EXISTING SYSTEM (PHOTO SECTION) (DIRECTION OF VIEW)</div><div>EQUIPMENT TAG</div><div>SHEET KEYNOTE (NEW CONSTRUCTION)</div><div>DEMOLITION KEYNOTE</div><div>REVISION SEQUENCE NUMBER</div><div>ROOM TAG (ROOM NO NOT ALWAYS SHOWN)</div><div>SECTION/ELEVATION REFERENCE</div><div>DETAIL / CALLOUT REFERENCE</div></div><div><div>VIEW REF</div><div>SHEET REF</div><div>VIEW REF</div><div>SHEET REF</div></div><div>SYMBOL LEGEND, GENERAL NOTES:<div>A. LEGENDS ARE GENERAL, NOT ALL SYMBOLS AND/OR DESIGNATIONS MAY APPEAR ON THE DRAWINGS.</div></div></div>	<div>A. ALL DIMENSIONS, DUCT SIZES AND PIPE SIZES ARE IN INCHES UNLESS NOTED OTHERWISE. ALL DUCT DIMENSIONS ARE INSIDE DIMENSIONS.</div> <div>B. COORDINATE WALL, ROOF, FLOOR AND CEILING OPENINGS FOR NEW PIPE AND DUCT RISERS AND CONDUIT PENETRATIONS. PROVIDE SLEEVES AROUND PIPES AND DUCTS THROUGH ALL FLOORS/CEILINGS/WALLS/PARTITIONS.</div> <div>C. FIELD VERIFY AND COORDINATE DUCTWORK AND PROVIDE OFFSETS TO ACCOMMODATE DUCTWORK THROUGH/BETWEEN JOISTS, BETWEEN BEAMS AND EXISTING BUILDING STRUCTURE, WALL STUDS, ETC. AT NO ADDITIONAL COST.</div> <div>D. EQUIPMENT, APPLIANCES, ETC.: STRUCTURAL JOISTS, BEAMS, ETC. AND LIGHTING FIXTURES, ELECTRICAL EQUIPMENT, ETC. WHERE SHOWN ARE FOR REFERENCE ONLY. VERIFY AND COORDINATE IN FIELD. REFER TO RESPECTIVE DRAWINGS.</div> <div>E. ALL EQUIPMENT, PIPING AND DUCTWORK SHALL BE SUPPORTED FROM JOIST/TRUSS TOP CHORD, UNLESS OTHERWISE NOTED. DO NOT SUPPORT ANYTHING FROM ROOF DECK.</div> <div>F. ALL PIPING AND DUCTWORK IN AREAS WITH CEILINGS SHALL BE RUN CONCEALED ABOVE ACOUSTICAL OR PLASTER CEILINGS UNLESS OTHERWISE NOTED.</div> <div>G. ALL OPENINGS IN DUCTS, PIPES OR FITTINGS SHALL BE KEPT PLUGGED OR CAPPED UNTIL CONNECTED.</div> <div>H. INSTALL SUFFICIENT NUMBER OF UNIONS/FLANGES IN ALL PIPE LINES TO ALLOW REMOVAL OF PIPES WITHOUT BREAKING FITTINGS.</div> <div>I. RUNOUTS TO EQUIPMENT SHALL BE RUN IN SIZES INDICATED AND INCREASED OR REDUCED AT POINT OF FINAL CONNECTION TO EQUIPMENT.</div> <div>J. THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE APPROXIMATE ARRANGEMENT OF THE SYSTEMS. THE CONTRACTOR SHALL FIELD VERIFY EXACT INFORMATION, DIMENSIONS, LOCATIONS, ETC. AS NECESSARY AND COORDINATE WORK ACCORDINGLY. NOT ALL INFORMATION IS SHOWN.</div> <div>K. CONNECT & EXTEND CONDENSATE DRAIN PIPING FROM EACH SS, DOAS, MFC, SBC, ETC. TO DESIGNATED FUNNEL DRAINS ONLY. PROVIDE MINIMUM 1" PIPE SIZE AND 2 PERCENT SLOPE FOR GRAVITY DRAINS AND 1 PERCENT SLOPE FOR PUMPED DRAINS.</div> <div>L. REFER TO ALL CONTRACT DOCUMENTS FOR ADDITIONAL REQUIREMENTS AND COORDINATE WORK ACCORDINGLY.</div> <div>M. REFER TO STRUCTURAL DRAWINGS FOR REQUIREMENTS FOR OPENING REINFORCEMENT, EQUIPMENT SUPPORTS, UNTELS AND CONCRETE PADS UNLESS OTHERWISE INDICATED.</div> <div>N. ALL FLOOR MOUNTED EQUIPMENT AND APPURTENANCES SHALL HAVE MINIMUM 6" THICK CONCRETE HOUSEKEEPING PAD WHETHER SHOWN OR NOT. SEE DETAILS ON MECHANICAL AND STRUCTURAL DRAWINGS.</div> <div>O. PROVIDE FULL ROOF OPENING SEE DUCT DROP FROM EACH EXHAUST FAN, RELIEF VENTILATOR, INTAKE PENTHOUSE, ETC. WITH MOISTURE TRAP. ALL TAKE-OFFS ARE FROM SIDE OF THE DROP.</div> <div>P. DO NOT INSTALL PIPING, DUCTWORK OR EQUIPMENT OVER ELECTRICAL EQUIPMENT. PROVIDE REQUIRED CLEARANCES FOR ALL ELECTRICAL EQUIPMENT PER NEC. COORDINATE LOCATIONS OF DUCTWORK, PIPING AND EQUIPMENT ABOVE CEILINGS WITH CABLE TRAYS.</div> <div>Q. WHERE DUCTWORK PASSES THROUGH FIRE RATED FLOORS OR WALLS (INCLUDING EXHAUST DUCTWORK), HVAC CONTRACTOR SHALL PROVIDE FUSIBLE LINK FIRE DAMPER, PROVIDE MINIMUM 18x18 ACCESS PANELS AT ALL FIRE DAMPERS AND FIRE SMOKE DAMPERS.</div> <div>R. PROVIDE MINIMUM 12x12 ACCESS DOOR IN NEW DUCTWORK 20'-0" ON CENTER FOR DUCT CLEANING PURPOSE.</div> <div>S. MAXIMUM LENGTH OF FLEXIBLE DUCTWORK SHALL BE 5'-0", ONLY WHERE SHOWN.</div> <div>T. CONNECT ALL DUCTS TO MECHANICAL EQUIPMENT BY FLEXIBLE DUCT CONNECTORS WITH NOT LESS THAN 3" SPACING BETWEEN DUCT AND EQUIPMENT.</div> <div>U. COORDINATE FINAL LOCATION OF ALL CEILING GRILLES AND DIFFUSERS WITH CEILING LAYOUT, LIGHTING, SPRINKLERS AND OTHER CEILING MOUNTED ITEMS. REFER TO REFLECTED CEILING PLANS ON ARCHITECTURAL DRAWINGS.</div> <div>V. SHOULD THE DRAWINGS DISAGREE WITH ONE ANOTHER OR WITH THE SPECIFICATIONS, THE BETTER QUALITY OR GREATER QUANTITY OF WORK OR MATERIALS SHALL BE PERFORMED OR PROVIDED.</div>					

REVISIONS	MARK	ISSUED DATE	DESCRIPTION

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