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----X-----

-----CWR-----

----CHWS----

----HWR-----

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DDCP

HVAC GENERAL SYMBOLS

<u>−D</u> ►

PITCH UP IN DIRECTION OF FLOW

CONCENTRIC REDUCER

FLANGED CONNECTION

EXPANSION LOOP

PIPE EXPANSION JOINT

PIPE ALIGNMENT GUIDE

PIPE ANCHOR

GATE VALVE

GLOBE VALVE

DRAIN VALVE

ANGLE GATE VALVE

ANGLE GLOBE VALVE

NEEDLE VALVE COCK

LOCK SHIELD VALVE

FLEXIBLE CONNECTOR

BUTTERFLY VALVE

SQUARE HEAD COCK

PLUG VALVE (TYPE AS NOTED)

THREE-WAY AUTOMATIC CONTROL VALVE

"Y" TYPE STRAINER WITH BLOWOFF VALVE AND CAP

AUTOMATIC CONTROL VALVE

THERMOMETER AND WELL

CONDENSER WATER RETURN

CONDENSER WATER SUPPLY

CHILLED WATER RETURN

CHILLED WATER SUPPLY

HOT WATER RETURN

HOT WATER SUPPLY

DOMESTIC WATER

POINT OF CONNECTION

NEW STEEL CUT

EXISTING STEEL CUT

- SECTION DESIGNATION

SECTION DESIGNATION

POINT OF DISCONNECTION

DIRECT DIGITAL CONTROL PANEL

SHEET No. WHERE SECTION IS SHOWN

SHEET No. WHERE SECTION IS SHOWN

PRESSURE GAUGE WITH SYPHON

BALANCING VALVE

BALL VALVE

CHECK VALVE, SWING OR LIFT

SILENT CHECK (NON-SLAM) VALVE

UNION

PITCH DOWN IN DIRECTION OF FLOW

ECCENTRIC REDUCER - FLAT BOTTOM

ECCENTRIC REDUCER - FLAT TOP

FLANGED END - BLIND FLANGE

DUCTWORK NEGATIVE PRESSURE (RETURN, EXHAUST OR OUTSIDE AIR) -----VD **VOLUME DAMPER** FIRE DAMPER AND ACCESS DOOR BACKDRAFT DAMPER AUTOMATIC DAMPER

M----SDM----AUTOMATIC SMOKE DAMPER COMBINATION SMOKE AND FIRE DAMPER FSD[M] WITH ACCESS DOOR RISE IN DUCTWORK (IN DIRECTION OF AIR FLOW ____R___ DROP IN DUCTWORK (IN DIRECTION OF AIR FLOW) ——D—— CENTERLINE ∳ OR CFM CUBIC FEET PER MINUTE DIAMETER

TYPE A CEILING DIFFUSER 400 CFM SUPPLY AIR RECTANGULAR CEILING DIFFUSER WITH 12"x12" NECK 400 CFM SUPPLY AIR 10x8 CR(CG) 10" BY 8" CEILING REGISTER (CEILING GRILLE) 300 CFM RETURN AIR RECTANGULAR DIFFUSER WITH BLANKING PLATE

SQUARE FEET

OVAL DUCTWORK

10" BY 6" TOP REGISTER, 150 CFM SUPPLY AIR 10x8 TR(TG) 150 € 10" BY 6" TOP REGISTER (TOP GRILLE) 150 CFM RETURN AIR 10" BY 6" BOTTOM REGISTER (BOTTOM GRILLE) 150 CFM RETURN AIR

VANED ELBOW (SEE DETAIL) OR RADIUS ELBOW **** FLEXIBLE DUCT SLOTTED LINEAR DIFFUSER WITH PLENUM

VANED ELBOW (SEE DETAIL)

DUCT FLEXIBLE CONNECTION }-----\\

VERTICAL DUCT DROP

(IN DIRECTION OF AIR FLOW)

VERTICAL DUCT RISE (IN DIRECTION OF AIR FLOW) **___**

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VARIABLE AIR VOLUME BOX <u>VAV-1</u> VARIABLE AIR VOLUME BOX, TYPE A, <u>VAV-1</u> WITH REHEAT COIL VARIABLE AIR VOLUME BOX, TYPE A, WITH SOUND ATTENUATOR AND REHEAT COIL THERMOSTAT HUMIDISTAT

SMOKE DETECTOR HUMIDIFIER ——UC—— RISE IN DUCTWORK (IN DIRECTION OF AIR FLOW) DPM DIFFERENTIAL PRESSURE MONITOR

HVAC EQUIPMENT DESIGNATIONS

- EQUIPMENT TAG NUMBER - FLOOR DESIGNATION - EQUIPMENT DESIGNATION - UNIT NUMBER 3 - SECOND FLOOR AIR CONDITIONING UNIT ,

HVAC CENTRAL PLANT SERVICES SYMBOLS

DIESEL ENGINE STEAM TURBINE STEAM TURBINE (CONDENSING) AIR TO AIR FIN HEAT EXCHANGER COOLING TOWER PROPELLER FAN -----BBD------BOTTOM BLOW DOWN ---BFW----**BOILER FEED WATER** COMPRESSED AIR -----CBD-----CONTINUOUS BLOW DOWN -----CF-----CHEMICAL FEED -----COND-----------DFW------DEAERATOR FEED WATER SURFACE BLOWDOWN

HVAC STEAM SERVICES SYMBOLS

RELIEF VALVE

s 🏂	SAFETY VALVE
──	PRESSURE REDUCING VALVE
þ	SYPHON
$-\!\!\!-\!\!\!\!-\!\!\!\!-\!\!\!\!-\!\!\!\!-\!\!\!\!-$	TRAP (TYPE AS NOTED)
CV]	CONTROL VALVE STATION (SEE DETAIL)
[PRV]	PRESSURE REDUCING VALVE STATION (SEE DETA
LPR	LOW PRESSURE CONDENSATE RETURN
LPS	LOW PRESSURE STEAM
HPR	HIGH PRESSURE CONDENSATE RETURN

HIGH PRESSURE STEAM

-----HPS-----

MECHANICAL ABBREVIATIONS **AMPERES** AUTOMATIC AIR VENT HRC AIR CONDITIONING AIR COOLED CONDENSING UNI HTWP AUTOMATIC CONTROL SYSTEM ACS AIR CONDITIONING UNIT HWP ACCESS DOOF AFTER FILTER AIR FOIL DOUBLE WIDTH ABOVE FINISHED FLOOR AFMS AIR FLOW MONITORING STATION IPS AIR FOIL SINGLE WIDTH AFSW AIR HANDLING UNIT ALUMINUM AUTOMATED MONITORING AND CONTROL SYSTEM ACCESS PANEL BOTTOM ANGULAR DISCHARGE LBS BLOW DOWN LCP **BOOSTER FAN** LDB BOTTOM GRILLE BOILER FEED PUMP LF, LIN.FT. LINEAR FEET BOTTOM HORIZONTAL DISCHARGE BRAKE HORSEPOWER BACKWARD INCLINE DOUBLE WIDTH BACKWARD INCLUDE SINGLE WIDTH LWB BUILDING MANAGEMENT SYSTEM LWT **BOTTOM REGISTER** BOTTOM THROAT MAX BRITISH THERMAL UNIT BTUH BTU PER HOUR CONVERTOR MCC CONTROL AIR COMPRESSOR MER COOLING COIL CCP CENTRAL CONTROL PANEL CCW COUNTER CLOCKWISE CD CEILING DIFFUSER CFFC CAP FOR FUTURE CONNECTION MOV CFM CUBIC FEET PER MINUT MX CFP CHEMICAL FEED PUMP CHILLER CHILLED WATER PUMP CLG CEILING COD CLEAN-OUT DOOR COMPR COMPRESSOR COND CONDENSATE COV CHAIR OPERATED VALVE CONDENSATE PUMP CP CPA CONTROL POINT ADJUSTMENT CPU CONDENSATE PUMP UNIT CR CEILING REGISTER COOLING TOWER CUBIC FEET CUBIC INCHES CABINET UNIT HEATER CONSTANT VOLUME CW CLOCKWISE CONDENSER WATER PUMP DEGREES CENTIGRADE (CELSIUS) DROP DRY BULB DOWN BLAST DISCHARGE DUCT FURNACE UNIT DFWP DEARATOR FEED WATER PUMP DG DIESEL GENERATOR DHW

NORMALLY OPEN NORMALLY CLOSED NOT IN CONTRACT NUMBER NPSH NET POSITIVE SUCTION HEAD NOT TO SCALE NTS OA OUTSIDE AIR **OUTSIDE AIR INTAKE** OUTSIDE DIAMETER OD OPEN END DUCT **OUTLET VELOCITY** PRE-COOLING COIL PCC PRESSURE DROP PRE-FILTER PHC PREHEAT COIL PRESSURE REDUCING VALVE POUNDS PER SQUARE INCH PSI PSIA PSI ABSOLUTE PSI GAUGE

HOUR

HEIGHT

HEAT RECOVERY COIL

HOT WATER PUMP

HEAT EXCHANGER

FREQUENCE

INCH OR INCHES

IRON PIPE SIZE

KILOWATT

POUNDS

HIGH TEMPERATURE WATER PUMP

HEATING AND VENTILATING

KITCHEN RANGE HOOD EXHAUST

LEAVING AIRE TEMPERATURE

LEAVING DRY BULB TEMPERATURE

LEAVING WET BULB TEMPERATURE

LEAVING WATER TEMPERATURE

THOUSAND BTU PER HOUR

MOTOR CONTROL CENTER

MOTOR HORSEPOWER

MOTOR OPERATED VALVE

MECHANICAL ROOM EXHAUST

MECHANICAL EQUIPMENT ROOM

LOCAL CONTROL PANEL

LINEAR DIFFUSER

LINEAR RETURN

LOW VELOCITY

MANUAL AIR VENT

MAXIMUM

MIXING BOX

MILLIMETER

MOTOR

LOCKED ROTOR AMPS

RELOCATED EXISTING EXISTING TO REMOVED AND RETURN TO OWNER RISE RETURN AIR DOMESTIC HOTER WATER RAD RADIATION RCC RECOOLING COIL DOWN REFR REFRIGERANT DIESEL OIL PUMP RETURN FAN RELATIVE HUMIDITY DRAWING DIRECT EXPANSION REHEAT COIL REHEAT WATER PUMP ø,DIAM DIAMETER RHWP RLA RUNNING LOAD AMPS EXISTING TO REMAIN RM ROOM EXISTING TO BE REMOVED ROT ROTATION EXISTING TO BE REMOVED & RELOCATED REVOLUTIONS PER MINUTE RPM EACH ENTERING AIR TEMPERATURE SUPPLY AIR SOUND ATTENUATION UNIT SECONDARY CHILLED WATER PUMP

EAT EDB ENTERING DRY BULB TEMPERATURE EDH ELECTRIC DUCT HEATER EDR EQUIVALENT DIRECT RADIATION EXHAUST FAN **ELEVATION** ELEC ELECTRIC ELEV ELEVATOR **EQUAL** EQ EXPANSION TANK EUH ELECTRIC UNIT HEATER EWB ENTERING WET BULB **EWT** ENTERING WET TEMPERATURE EXHUAST EXIST EXISTING EXP **EXPANSION** FILTER

DMPR

DN

DOP

DWG

(ER)

EΑ

(ERR)

FLOAT AND THERMOSTATIC FREE AREA (SQ.FT.) FLEXIBLE CONNECTION FCDW FORWARD CURVED DOUBLE WIDTH FCSW FORWARD CURVED SINGLE WIDTH FCU FAN COIL UNIT FIRE DAMPER FINAL FILTER FINISHED GRADE FIN FL FINISHED FLOOR FLA FULL LOAD AMPERES FOP FUEL OIL PUMP FOT FUEL COIL TANK FINS PER INCH FEET PER MINUTE FEET PER SECOND FLOOR REGISTER FEET FTR FINNED TUBE RADIATION

FACE VELOCITY FUME HOOD EXHAUST DEGREES FAHRENHEIT GAUGE GALLON GALLONS PER HOUR GPH GPM GALLONS PER MINUTE GENERAL EXHUAST HUMIDIFIER HALX HALON EXHAUST

HC HEATING COIL HD HEAD

SMOKE DETECTOR SUPPLY FAN SECONDARY HOT WATER PUMP STRIPLINE DIFFUSER SMK.CTL. SMOKE CONTROL OPERATION STATIC PRESSURE SPEC SPECIFICATION SQ.FT. SQUARE FEET STAINLESS STEEL SMOKE EXHAUST THROAT TOP ANGULAR DISCHARGE TDH TOTAL DYNAMIC HEAD TEMP **TEMPERATURE** TERMINAL FILTER TOP GRILLE TOP HORIZONTAL DISCHARGE TOP REGISTER TRANSFER DUCT TRANSFER FAN TRANSFER GRILLE TIP SPEED TOP THROAT TURNING VANES TOILET EXHAUST TYP **TYPICAL** UBD UPBLAST DISCHARGE UNIT HEATER UNLESS OTHERWISE NOTED VENTILATION AIR VAC VACUUM VAV VARIABLE AIR VOLUME UNIT **VENTILATION FAN** VARIABLE FREQUENCY DRIVE VARIABLE INLET VANES VACUUM PUMP

WITH

WB

WC

WITHOUT WET BULB

WATER COLUMN

WATER GAUGE WIRE MESH SCREEN WORKING PRESSURE WORKING STEAM PRESSURE

MECHANICAL DEMOLITION NOTES

1. ALL PIPING IN WALLS AND FLOORS NOT TO BE REUSED WILL BE PLUGGED OR CAPPED AND CUTTING AND PATCHING WILL BE PERFORMED TO RESTORE SURFACE TO ORIGINAL CONDITION BY THIS CONTRACTOR.

2. AFTER REMOVING PIPE THROUGH THE FLOOR SLABS, PACK OPENING WITH APPROVED FIRE-RATED

3. THE CONTRACTOR SHALL INCLUDE IN HIS PRICE ALL COSTS ASSOCIATED WITH REMOVALS AND RELOCATIONS OF HVAC WORK AS DESCRIBED ON THE DRAWINGS AND IN THE SPECIFICATIONS WITH ALLOWANCES FOR EXPECTED OR UNFORESEEN DIFFICULTIES WHEN CONCEALED WORK HAS BEEN OPENED. NO CLAIMS FOR ADDITIONAL WORK ASSOCIATED WITH DEMOLITION WILL BE ACCEPTED, EXCEPT IN CERTAIN CASES CONSIDERED JUSTIFIABLE BY THE OWNER/ENGINEER.

4. THE CONTRACTOR SHALL PERFORM DEMOLITION AND REMOVAL WORK WITH MINIMUM INTERFERENCE WITH FUNCTIONING HVAC SYSTEMS. ALL AFFECTED SYSTEMS SHALL BE RECONNECTED AND RESTORED.

DEMOLITION AND REMOVAL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER. THE CONTRACTOR SHALL PATCH, REPAIR OR OTHERWISE RESTORE ANY DAMAGED INTERIOR OR EXTERIOR BUILDING SURFACE TO ITS ORIGINAL CONDITION.

6. THE CONTRACTOR SHALL REMOVE ALL DUCT & PIPING SUPPORTS, ETC. FROM PARTITIONS THAT ARE TO BE REMOVED. WHERE THE REMOVAL OF THESE ITEMS DISRUPTS EXISTING PIPING THAT IS TO REMAIN, THE CONTRACTOR SHALL INSTALL AND PROVIDE BYPASS CONNECTIONS NECESSARY.

7. ALL PIPING WHICH BECOMES EXPOSED DURING THE ALTERATION WORK SHALL BE REMOVED AND REROUTED CONCEALED BEHIND FINISHED SURFACES.

8. PORTIONS OF PIPING & DUCTWORK TO BE REMOVED OR ABANDONED AS A RESULT OF DEMOLITION WORK BUT WHICH ARE REQUIRED TO REMAIN ACTIVE, SHALL BE CUT AT CONVENIENT LOCATIONS, REROUTED AND RECONNECTED.

9. THE CONTRACTOR SHALL NOTIFY THE OWNER AT THE APPROPRIATE TIME OF THE PROJECTED DEMOLITION AND PHASING SCHEDULE SO THAT REMOVAL OR RELOCATION OF AFFECTED UTILITIES MAY BE CARRIED OUT IN COORDINATION WITH THE PROJECT REQUIREMENTS.

10. ALL EXISTING MATERIAL AND EQUIPMENT IN USABLE CONDITION, WHICH IS TO BE REMOVED UNDER THIS CONTRACT, SHALL REMAIN THE PROPERTY OF THE OWNER OR SHALL BE DISPOSED OF BY THE HVAC CONTRACTOR, AS DIRECTED BY THE OWNER.

11. ARRANGE TO WORK CONTINUOUSLY, INCLUDING OVER TIME, IF REQUIRED, TO ASSURE THAT SYSTEMS WILL BE SHUT DOWN ONLY DURING THE TIME ACTUALLY REQUIRED TO MAKE THE NECESSARY CONNECTIONS TO THE EXISTING SYSTEMS.

12. THE SHUTDOWN OF EXISTING BUILDING HVAC SERVICES SHALL BE COORDINATED WITH THE OWNER. MAKE ARRANGEMENTS AT LEAST 5 BUSINESS DAYS PRIOR TO A SHUTDOWN.

1.3 CONTRACTOR SHALL COMPLY WITH ALL FEDERAL STATE & LOCAL REQUIREMENTS REGARDING DISPOSAL OF REFRIGERANTS.

MECHANICAL GENERAL NOTES

1. GENERAL NOTES, SYMBOL LIST AND DETAILS ARE APPLICABLE TO ALL HVAC/MECHANICAL DRAWINGS.

ALL WORK IS NEW UNLESS OTHERWISE NOTED.

3. DRAWINGS ARE DIAGRAMMATIC. DETERMINE LOCATIONS OF SYSTEMS AND COMPONENTS IN FIELD. RELOCATE EXISTING WORK THAT INTERFERES WITH WORK OF THIS CONTRACT.

COORDINATE THIS WORK WITH THAT OF OTHER TRADES.

5. DIMENSIONS SHOWN ON PLAN ARE HORIZONTAL. DIMENSIONS SHOWN IN ELEVATION ARE VERTICAL EXCEPT IN WAY OF STRUCTURAL STEEL, DIMENSIONS ARE MEASURED PERPENDICULAR TO FLANGE.

NEITHER ACCURACY NOR COMPLETION OF SERVICES AND UTILITY LOCATIONS SHOWN ON DRAWINGS IS GUARANTEED. DETERMINE EXACT LOCATIONS OF EXISTING SERVICES AND UTILITIES IN FIELD, WHETHER OR NOT SHOWN ON DRAWINGS. EXERCISE CAUTION AND IDENTIFY LOCATIONS OF UNMARKED UTILITY LINES AS NECESSARY TO PERFORM WORK OF THIS SECTION.

7. MANUFACTURERS MODEL NUMBERS ARE SPECIFIED SOLELY TO ESTABLISH STANDARDS OF QUALITY FOR PERFORMANCE AND MATERIALS.

8. PRODUCT INSTALLATION SHALL ADHERE TO MANUFACTURERS RECOMMENDATIONS.

9. PROVIDE ACCESS PANELS FOR EQUIPMENT THAT REQUIRES PERIODIC SERVICE.

10. PROVIDE HANGERS, INSERTS, ANCHORS, SUPPLEMENTAL STEEL & SUPPORTS AS REQUIRED TO SUPPORT DUCTWORK, PIPING AND EQUIPMENT FROM STRUCTURE.

11. SCHEDULE WORK OF THIS SECTION TO AVOID INTERFERING WITH EXISTING OPERATIONS IN THE FACILITY.

12. COORDINATE ROOF PENETRATIONS WITH WORK OF OTHER SECTIONS AND WITH FLASHING REQUIREMENTS. MECHANICAL CONTRACTOR TO NOTIFY OWNER PRIOR TO STARTING WORK TO VERIFY COMPLIANCE WITH BOND AND WARRANTY OF EXISTING ROOF.

13. RUN DUCTS AND PIPING CONCEALED, UNLESS OTHERWISE SPECIFIED AND CLEAR OF CEILING INSERTS

14. INSTALL THERMOSTATS 4'-6" ABOVE FINISHED FLOOR OR AS DIRECTED OTHERWISE BY ARCHITECT.

15. STRUCTURAL WELDING SHALL BE CONTINUOUS 1/4" FILLET UNLESS REQUIRED OTHERWISE.

AIR SYSTEMS

16. AIR SYSTEMS REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF AIR DEVICES.

17. INTERNAL AIRFLOW DIMENSIONS ARE SHOWN FOR DUCTS. INCREASE DUCT SIZE AS NECESSARY TO MAINTAIN FREE FLOW AREA INDICATED.

18. USE FLAT TRANSVERSE SEAM FOR DUCTWORK WHERE SPACE AVAILABLE DICTATES.

19. DIFFUSER SIZES SHOWN ARE NECK SIZES. REGISTERS AND GRILLE SIZES ARE NOMINAL.

20. PROVIDE VOLUME DAMPERS OR OTHER APPROVED BALANCING DEVICES AT DUCT BRANCHES AND RUN OUTS.

21. PROVIDE 36" CLEARANCE IN FRONT OF ALL ELECTRIC CONTROL PANELS PER N.E.C. AND MFG. REQUIREMENTS. 22. PROVIDE DUCT TRANSITIONS FROM VAV BOX INLET/OUTLET DUCT WORK AT SIZES INDICATED TO VAV BOX

INLET/OUTLET UNIT CONNECTIONS.

23. VAV DUCT INLET SIZE SHALL BE AS SCHEDULED OR AS INDICATED ON THE FLOOR PLANS. PROVIDE TRANSITION FROM DUCT SIZE INDICATED ON THE FLOOR PLANS TO SCHEDULED SIZE MINIMUM 2'-0" FROM VAV BOX INLETS.

PIPING SYSTEMS

24. PITCH PIPING 1" IN 20' IN DIRECTION OF FLOW.

25. PROVIDE TRAPS IN CONDENSATE LINES THAT EXTEND OVER 2".

MECHANICAL DRAWING LIST		
PRAWING No.	DRAWING TITLE	
/100-01	MECHANICAL COVER SHEET	
100-10	MECHANICAL SCHEDULES	
100-20	MECHANICAL DETAILS	
/100-21	MECHANICAL DETAILS	
100-30	MECHANICAL SPECIFICATIONS	
100-31	MECHANICAL SPECIFICATIONS	
/01-06	MECHANICAL FLOOR PLAN LEVEL 6 - DEMOLITION DUCTWORK	
102-06	MECHANICAL FLOOR PLAN LEVEL 6 - DEMOLITION PIPING	
103-06	MECHANICAL FLOOR PLAN LEVEL 6 - DUCTWORK	

MECHANICAL FLOOR PLAN LEVEL 6 - PIPING

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Revisions

ISSUED FOR PERMIT 06-08-15 ISSUE DATE Sheet Information MAY 1,2015 B140185-000 Job Number

> **MECHANICAL COVER SHEET**

M00-01

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