MECHANICAL SYSTEM ABBREVIATIONS

A	AMPERES
AC	AIR CONDENSING UNIT (DX TYPE)
AD	ACCESS DOOR
AFC	AIR FAN CURTAIN
AFF	ABOVE FINISHED FLOOR
AFMD	AIR FLOWING MEASURING DEVICE
AHU	AIR HANDLING UNIT
APD	AIR PRESSURE DIFFERENTIAL
ASHRAE	AMERICAN SOCIETY OF HEATING REFRIGERATING AND AIR CONDITIONING ENGINEERS
BD	BACKDRAFT DAMPER
BHP	BRAKE HORSEPOWER
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNITS PER HOUR
BOP	BOTTOM OF PIPE
BOD	BOTTOM OF DUCT
CF	CUBIC FOOT
CFM	CUBIC FEET PER MINUTE
CHW	CHILLED WATER
CO	CLEAN OUT
CU	CONDENSING UNIT
CV	CONSTANT VOLUME
CW	CONDENSER WATER
DA	DRY AIR
DB	DRY BULB (TEMPERATURE)
DB	DECIBEL (UNIT OF LOGARITHMIC SOUND POWER OR SOUND PRESSURE RATIO)
DDC	DIRECT DIGITAL CONTROL
DG	DOOR GRILLE
DP	DIFFERENTIAL PRESSURE
DT	DIFFERENTIAL TEMPERATURE
DX	DIRECT EXPANSION (COIL)
EA	EACH
E/A	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EDH	ELECTRIC DUCT HEATER
EEF	EMERGENCY EXHAUST FAN (E.H.P.A.)
EF	EXHAUST FAN
EG	EXHAUST GRILLE
EMCS	ENERGY MANAGEMENT & CONTROL SYSTEM
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
(E)	EXISTING
F&BPD	FACE & BY-PASS DAMPER
FBC	FLORIDA BUILDING CODE - BUILDING
FBC-M	FLORIDA BUILDING CODE - MECHANICAL
F	FIRE DAMPER
FEEC	FLORIDA ENERGY EFFICIENCY CODE
FLA	FULL LOAD AMPS
FPF	FINS PER FOOT (IN THE COIL)
FPI	FINS PER INCH (IN THE COIL)
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
GPM	GALLONS PER MINUTE
H	HUMIDISTAT
HP	HORSEPOWER
HVAC	HEATING VENTILATION AND AIR CONDITIONING
IAQ	INDOOR AIR QUALITY
ID	INSIDE DIAMETER
KW	KILOWATT = 1000 WATTS
LAT	LEAVING AIR TEMPERATURE
LAT	LATENT (HEAT LOAD)
LB	POUND (UNIT OF MASS)
LWT	LEAVING WATER TEMPERATURE
MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
M	MOTORIZED
MBH	THOUSANDS OF BTUS PER HOUR
MUA	MAKE UP AIR
NC	NOISE CRITERIA
(N)	NEW
O/A	OUTDOOR AIR
OAD	OUTDOOR AIR DAMPER
OAF	OUTSIDE AIR FAN
OAI	OUTDOOR AIR INTAKE
OAL	OUTDOOR AIR LOUVER
OAR	OUTDOOR AIR RELIEF
PCF	POUNDS PER CUBIC FOOT
PD	PRESSURE DIFFERENTIAL
PSI	POUNDS PER SQUARE INCH
R/A	RETURN AIR
RE	RELIEF EXHAUST CAP
REF	RELIEF EXHAUST FAN
RG	RETURN GRILLE
RH	RELATIVE HUMIDITY (%)
RPM	REVOLUTIONS PER MINUTE
RV	RELIEF VENT
S	SMOKE DAMPER
S/A	SUPPLY AIR
SAT	SUPPLY AIR TEMPERATURE
SAT	SATURATION, SATURATED
SCBA	SELF CONTAINED BREATHING APPARATUS
SCT	SATURATION CONDENSING TEMPERATURE
SD	SMOKE DETECTOR
SEN	SENSIBLE (HEAT LOAD)
SF	SUPPLY FAN
SH	SENSIBLE HEAT
SHG	SENSIBLE HEAT GAIN
SHR	SENSIBLE HEAT RATIO
SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION
SST	SATURATION SUCTION TEMPERATURE
SZ	SINGLE ZONE (TYPE OF AHU)
T	THERMOSTAT
TD	TRANSFER DUCT
TG	TRANSFER GRILLE
TR	TRANSFER REGISTER
TSP	TOTAL STATIC PRESSURE
TU	TERMINAL UNIT
UC	DOOR UNDERCUT (IN HVAC DRAWINGS)
V	VOLTS
VAV	VARIABLE AIR VOLUME (TYPE OF HVAC EQUIPMENT)
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
W	WATT (UNIT OF POWER)
WB	WET BULB (TEMPERATURE)
WPD	WATER PRESSURE DIFFERENTIAL

LEED NOTES:

1. THIS PROJECT IS PURSUING LEED NC v4 CERTIFICATION. ALL CONTRACTORS WITH SCOPE CONTRIBUTING TOWARDS THE LEED REQUIREMENTS SHALL BE RESPONSIBLE FOR DOCUMENTING AND EXECUTING ALL ACTIVITIES AS DIRECTED BY SECTION 018113 SUSTAINABLE DESIGN REQUIREMENTS OF THE SPECIFICATION BOOK FOR FURTHER INFORMATION.
2. AN INDEPENDENT COMMISSIONING AGENT HAS BEEN RETAINED TO ENSURE THAT THIS PROJECT IS COMPLETED ACCORDING TO OWNER REQUIREMENTS. COMMISSIONED SYSTEMS SHALL INCLUDE HVAC&LIGHTING/LIGHTING CONTROL, DOMESTIC HOT WATER (AND ON-SITE ENERGY GENERATOR IF ANY). ALL CONTRACTORS WITH SCOPE FOR THESE SYSTEMS SHALL BE RESPONSIBLE FOR CARRYING OUT TESTING ACTIVITIES AS DIRECTED BY COMMISSIONING AGENT. SEE THE PROJECT COMMISSIONING PLAN FOR FURTHER INFORMATION. ALL CONTRACTORS WITH SCOPE CONTRIBUTING TOWARDS THE COMMISSIONING REQUIREMENTS SHALL BE RESPONSIBLE FOR DOCUMENTING AND EXECUTING ALL ACTIVITIES AS DIRECTED BY SECTION 019113 GENERAL COMMISSIONING REQUIREMENTS OF THE SPECIFICATION BOOK FOR FURTHER INFORMATION.

GENERAL NOTES FOR THE CONTROL SYSTEM:

1. ANY MECHANICAL CONTROLS MUST BE INTEGRATED INTO THE EXISTING DELTA WEB SERVER.
2. NEW CONTROLS SHALL BE INTEGRATED WITH THE EXISTING DELTA CONTROLS SERVER LOCATED AT MDCPLS CENTRAL FACILITY. INTEGRATION SHALL INCLUDED GRAPHICS AND COMMUNICATIONS WITH THE EXISTING ENTERPRISE SERVER. THE CONTROL SYSTEM SHALL HAVE THE CAPABILITY OF BEING PROGRAMMED FROM THE CENTRAL ENTELIWEB SOFTWARE AS ELL AS BEING ABLE TO MAKE GRAPHICAL CHANGES FROM ENTELIWEB. COMMUNICATION PROTOCOL FOR THE INTEGRATION SHALL BE THE NATIVE BACNET. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY COORDINATION AND COST ASSOCIATED WITH THE INTEGRATION. INTEGRATION TO EXISTING DELTA CONTROLS FRONT END EMS SYSTEM SHALL BE INCLUDED AS PART OF THIS PROJECT. WE NEED ACCESS TO THE CONTROL LOCAL IN CASE THE REMOTE COMMUNICATION FAIL. HUMAN INTERFACE LOCAL.

MDPLS COORDINATION NOTES:

1. MDPLS MUST BE PRESENT FOR THE TEST AND BALANCE. MDPLS WILL NEED NO LESS THAN 48 HR. NOTICE BEFORE ANY TESTS ARE CONDUCTED.
2. THE START UP OF THE EQUIPMENT MUST BE DONE BY THE MANUFACTURER AND MDPLS MUST BE PRESENT FOR THE START UP. MDPLS WILL NEED NO LESS THAN 48 HR. NOTICE
3. ALL STAFF WORKING ON THE MECHANICAL TRADES MUST HAVE NO LESS THAN JOURNEYMAN CERTIFICATION.
4. MDPLS MUST BE PRESENT FOR THE REMOVAL OF ALL STRAINERS. MDPLS WILL NEED NO LESS THAN 48 HR. NOTICE BEFORE ANY WORK IS CONDUCTED.

MECHANICAL GENERAL NOTES

1. THE CONTRACTOR SHALL FURNISH ALL LABOR MATERIALS AND EQUIPMENT NECESSARY FOR THE INSTALLATION OF THE HVAC SYSTEM IN ACCORDANCE WITH THESE DRAWINGS.
2. THE CONTRACTOR IS RESPONSIBLE FOR VISITING THE SITE OF THE WORK AND BECOMING FAMILIAR WITH THE CONDITIONS OF THE WORK PRIOR TO SUBMITTING A BID. THE CONTRACTOR IS REQUIRED TO BECOME FAMILIAR WITH ALL THE CONTRACT DOCUMENTS PERTAINING TO THE PROPOSED WORK. THE SUBMISSION OF A BID SHALL BE SUFFICIENT TO ESTABLISH THAT THE CONTRACTOR HAS INVESTIGATED THE SITE OF THE WORK AND IS SATISFIED AS TO ALL REASONABLE CONDITIONS TO BE ENCOUNTERED, THE WORK TO BE PERFORMED AND THE MATERIALS TO BE PROVIDED IN THE COMPLETION OF THE PROJECT.
3. FAILURE OF BIDDERS TO MAKE REQUIRED VISITATIONS AND/OR INVESTIGATIONS TO INFORM THEMSELVES FULLY OF EXISTING CONDITIONS, AND TO INCLUDE IN THEIR PROPOSALS A SUM SUFFICIENT TO COVER ALL POSSIBLE FIELD CONDITIONS, WILL NOT IN ANY WAY ENTITLE THEM TO ANY EXTRA CHARGES OVER AND ABOVE THEIR ORIGINAL PROPOSALS.
4. ALL WORK SHALL BE COORDINATED WITH ALL OTHER TRADES AT JOB SITE PRIOR TO FABRICATION AND INSTALLATION OF EQUIPMENT. ANY DISCRIPANCIES BETWEEN THE WORK DEPICTED ON THESE DOCUMENTS AND THE ACTUAL CONDITIONS ENCOUNTERED SHALL BE BROUGHT PROMPTLY TO THE ENGINEER FOR REVIEW AND CLARIFICATION.
5. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT PROPERTY IN AREAS WHERE WORK IS BEING CONDUCTED. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES CAUSED TO BUILDING COMPONENTS DUE TO NEW WORK OPERATIONS. PATCH AND REPAIR EXISTING SURFACES DAMAGED AS REQUIRED TO MATCH ADJACENT SURFACES.
6. CONTRACTOR SHALL PROVIDE DURING CONSTRUCTION ALL SAFETY MEASURES AND FEATURES AS REQUIRED BY THE APPLICABLE CODES, RULES AND REGULATIONS HAVING JURISDICTION OVER THE PROJECT.
7. THE WORK THAT IS TO BE DONE UNDER THIS CONTRACT INCLUDES THE FURNISHING OF ALL LABOR, MATERIALS AND EQUIPMENT, PERMITS, FEES, INSPECTIONS, TESTS, INSURANCE, ETC., REQUIRED FOR THE COMPLETION OF THE HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS SHOWN ON DRAWINGS.
8. THE DRAWINGS ARE GENERALLY DIAGRAMMATIC. THEY DO NOT SHOW EVERY BEND, OFF-SET, ELBOW OR OTHER FITTINGS WHICH MAY BE REQUIRED FOR THE INSTALLATION IN THE SPACE ALLOCATED.
9. DRAWINGS ARE NOT TO BE SCALED. UNLESS SPECIFIC DIMENSIONS ARE SHOWN, THE STRUCTURAL DRAWINGS AND SITE CONDITIONS SHALL GOVERN EXACT LOCATION OF MECHANICAL EQUIPMENT TO BE INSTALLED.
10. IT IS THE INTENT OF THE PLANS AND GENERAL NOTES TO PROVIDE A COMPLETE AND OPERATING INSTALLATION INCLUDING ALL NECESSARY ITEMS REQUIRED, EVEN THOUGH ITEMS ARE NOT INDICATED ON THE DRAWINGS OR IN THE NOTES. ALL WORK CONSIDERED NECESSARY FOR THE COMPLETION OF THE WORK IN PROPER MANNER NOT SHOWN ON THE PLANS OR NOTES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING PRIOR TO BIDS OTHERWISE WORK SHALL NOT BE ADDITIONALLY CHARGED AFTER BID IS AWARDED.
11. SUBMIT SHOP DRAWINGS OF ALL MATERIALS, DUCTWORK, DUCT LAYOUT AND EQUIPMENT FOR REVIEW BY ENGINEER PRIOR TO FABRICATION AND/OR INSTALLATION.
12. ALL DUCT SIZES SHOWN ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS.
13. THE CONTRACTOR SHALL TEST ALL EQUIPMENT, MAKE PRELIMINARY ADJUSTMENTS AND CALIBRATE ALL CONTROLS PRIOR TO REQUESTING TEST AND BALANCE SERVICES.
14. NO PORTION OF THE NEW DUCTWORK OR ITS SUPPORTS SHALL MAKE CONTACT WITH PARTITIONS, CEILING, LIGHTS, ETC.
15. CONTRACTOR SHALL WARRANT ALL WORK TO BE FREE OF DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF FIVE YEAR AFTER ACCEPTANCE OF THE INSTALLATION. 1
16. ALL MATERIALS SHALL BE NEW. ANY DAMAGED EQUIPMENT SHALL BE REPLACED OR RESTORED TO ORIGINAL CONDITION.
17. PROVIDE CEILING/WALL ACCESS PANELS WHERE REQUIRED TO ACCESS HVAC EQUIPMENT. PANELS SHALL BE RECESSED TYPE, FIRE RATED IF IN FIRE RATED WALLS OR CEILINGS. LOCATION OF PANELS SHALL BE COORDINATED WITH ALL THE OTHER TRADES.
18. ALL PENETRATIONS FROM THE EXTERIOR MUST BE SEALED, ALL PENETRATIONS ON THE CEILING MUST BE SEALED. THE BUILDING PRESSURE SHALL BE POSITIVE AND ALL CEILING GRID MUST BE INSULATED AS PER MANUFACTURER SPECIFICATIONS TO AVOID CONDENSATION.
19. CONTRACTOR SHALL OBTAIN THE SERVICES OF AN INDEPENDENT, CERTIFIED TEST AND BALANCE COMPANY TO BALANCE THE AIR SYSTEM ASSOCIATED WITH THE NEW AND EXISTING MECHANICAL EQUIPMENT AS SHOWN TO THE QUANTITIES AND CAPACITIES INDICATED ON THE PLANS. CONTRACTOR SHALL SUBMIT (3) COPIES OF REPORT TO ENGINEER UPON COMPLETION FOR REVIEW.
20. DURING CONSTRUCTION, ALL SUPPLY DUCTWORK OPENINGS SHALL BE FITTED WITH BLANKET TYPE, DISPOSABLE 1" THICK SYNTHETIC MEDIA IN ORDER TO PREVENT CONSTRUCTION DEBRIS FROM ENTERING AND ACCUMULATING INSIDE THE DUCT SURFACES.
21. UPON COMPLETION, CONTRACTOR SHALL CLEAN ALL DUST AND DEBRIS IN AREAS WHERE WORK WAS CONDUCTED.
22. ALL WORK SHALL CONFORM WITH THE 7TH EDITION, 2020 FLORIDA BUILDING CODE AND ALL APPLICABLE CODES AND REGULATIONS.
23. PRIOR TO BID, CONTRACTOR SHALL FIELD VERIFY THAT ALL REMAINING EXISTING DUCTWORK , CONDUITS, FIRE SPRINKLERS LINES, PLUMBING LINES AND OTHER UTILITIES IN NEW CEILING AREAS ARE NOT IN CONFLICT WITH NEW CONSTRUCTION. CONTRACTOR SHALL INCLUDE IN BID THE RELOCATION /RE-ROUTING OF ANY CONFLICTING ITEMS AS REQUIRED.
24. ALL COMPONENTS OF MECHANICAL EQUIPMENT NOT JUST THE MAJOR COMPONENTS AND INCLUDING VFD'S, COMPRESSORS, COILS, CONTROL COMPONENTS, CONTROL PANELS, REFRIGERATION LINES, DISPLAYS, SENSORS, CONTROL COMPONENTS, BREAKERS, FUSES, FANS, DAMPERS, ETC.... MUST HAVE A 5 YEAR (PARTS AND LABOR). 2
25. ALL EXTERIOR EQUIPMENT MUST BE TREATED FOR CORROSION (THIRD PARTY E-COATING). AS IT RELATES TO THE E-COATING, PROVIDE ADDITIONAL COATING BY LUVATA COATING. THIS COATING IS TO BE APPLIED TO THE ENTIRE CHILLER (ALL COMPONENTS, PANELS AND FRAMEWORK).
26. THE CHILLER MUST COMMUNICATE WITH THE BMS (DELTA CONTROLS) AND MUST BE TIED INTO THE EXISTING BMS AT THE SITE AS WELL AS THE HVAC CLOUD SERVER.
27. ALL INSULATION MUST HAVE ALUMINUM JACKET (CHILLED WATER AND HOT WATER).
28. THE MAKE UP WATER MUST BE CERTIFIED.
29. ALL MATERIALS (PIPES, COPPER AND VALVES) MUST BE UL CERTIFIED AND MADE IN THE USA AS REQUIRED.
30. A LIBRARY DEPARTMENT REPRESENTATIVE MUST BE PRESENT DURING ANY TESTING TO BE CONDUCTED DURING CONSTRUCTION (TEST AND BALANCE, DUCT AND PIPING PRESSURE TEST, PIPING FLUSH). THE CONTRACTOR SHOULD NOT PERFORM THESE TEST WITHOUT THE ABOVE MENTIONED REPRESENTATIVE PRESENT.
31. ALL WELDING SHALL BE PERFORMED BY A CERTIFIED WELDER PER ANSI/ASME SECTION 9 AND AWS "STANDARD QUALIFICATIONS PROCEDURE" TO PERFORM THE TYPE OF WORK REQUIRED. ALL WELDING SHALL BE IN ACCORDANCE WITH AWS WELDING CODE. THE CONTRACTOR MUST SUBMIT PROOF OF CERTIFICATION TO MDPLS BEFORE PERFORMING ANY WELDING WORK.
32. ALL PIPING INSULATION SHALL BE PERFORMED BY CERTIFIED PIPE INSULATORS. THE CONTRACTOR MUST SUBMIT PROOF OF CERTIFICATION TO MDPLS BEFORE PERFORMING ANY INSULATION WORK.
33. ALL PIPE INSTALLATION SHALL BE PERFORMED BY CERTIFIED PIPE FITTERS. THE CONTRACTOR MUST SUBMIT PROOF OF CERTIFICATION TO MDPLS BEFORE INSTALLING ANY PIPE.
34. PROVIDE OWNER WITH (3) HARD BOUND SETS OF SYSTEM OPERATING INSTRUCTIONS FOR ALL EQUIPMENT INCLUDING CONTROLS.

APPLICABLE CODES / STANDARDS

APPLICABLE CODES AND STANDARDS SHALL INCLUDE ALL STATE LAWS, LOCAL ORDINANCES, UTILITY COMPANY REGULATIONS AND THE APPLICABLE REQUIREMENTS OF THE FOLLOWING ACCEPTED CODES AND STANDARDS, WITHOUT LIMITING THE NUMBER, AS FOLLOWS:

1. FLORIDA BUILDING CODE - 7th EDITION (2020)
2. FLORIDA FIRE PREVENTIVE CODE - 7th EDITION (2020)
3. GUIDELINES FOR DESIGN AND CONSTRUCTION OF HEALTH CARE FACILITIES 2014
4. ENVIRONMENTAL PROTECTION AGENCY (EPA).
5. DEPARTMENT OF ENVIRONMENTAL REGULATION MANAGEMENT (DERM).
6. LOCAL ORDINANCES, REGULATIONS OF THE BUILDING DEPARTMENTS AND FIRE DEPARTMENTS.
7. OCCUPATIONAL SAFETY AND HEALTH STANDARD.
8. RECOMMENDATION OF NFPA, IN GENERAL AND IN PARTICULAR:
   - A. NATIONAL ELECTRIC CODE, NPFA 70 (2017)
   - B. NATIONAL FIRE ALARM & SIGNALING CODE, NFPA 72 (2018)
   - C. HVAC, NFPA 90A (2018)
   - D. HVAC, NFPA 90B (2018)
   - E. HVAC, NFPA 96 (2017)
   - F. STANDARD FOR INSTALLATION OF EXHAUST SYSTEMS, NFPA 91 (2015)
9. RECOMMENDATION OF ASHRAE FUNDAMENTALS (2005).
10. JOINT COMMISSIONS FIRE ALARM POLICY.
11. FLORIDA WITH DISABILITIES ACCESSIBILITY ACT (2017).
12. SMACNA (2005).

MECHANICAL DEMOLITION NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR VISITING THE SITE OF THE WORK AND BECOMING FAMILIAR WITH THE CONDITIONS OF THE WORK PRIOR TO SUBMITTING A BID. THE CONTRACTOR IS REQUIRED TO BECOME FAMILIAR WITH ALL THE CONTRACT DOCUMENTS PERTAINING TO THE PROPOSED WORK. THE SUBMISSION OF A BID SHALL BE SUFFICIENT TO ESTABLISH THAT THE CONTRACTOR HAS INVESTIGATED THE SITE OF THE WORK AND IS SATISFIED AS TO ALL REASONABLE CONDITIONS TO BE ENCOUNTERED, THE WORK TO BE PERFORMED AND THE MATERIALS TO BE PROVIDED IN THE COMPLETION OF THE PROJECT.
2. FAILURE OF BIDDERS TO MAKE REQUIRED VISITATIONS AND/OR INVESTIGATIONS TO INFORM THEMSELVES FULLY OF EXISTING CONDITIONS, AND TO INCLUDE IN THEIR PROPOSALS A SUM SUFFICIENT TO COVER ALL POSSIBLE FIELD CONDITIONS, WILL NOT IN ANY WAY ENTITLE THEM TO ANY EXTRA CHARGES OVER AND ABOVE THEIR ORIGINAL PROPOSALS.
3. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT PROPERTY IN AREAS WHERE WORK IS BEING CONDUCTED. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES CAUSED TO BUILDING COMPONENTS DUE TO DEMOLITION OPERATIONS. PATCH AND REPAIR EXISTING SURFACES DAMAGED AS REQUIRED TO MATCH ADJACENT SURFACES.
4. REMOVE, CUT, ALTER, REPLACE, PATCH AND REPAIR EXISTING WORK AS NECESSARY TO INSTALL NEW WORK, EXCEPT AS OTHERWISE SHOWN OR SPECIFIED. DO NOT CUT ALTER OR REMOVE ANY STRUCTURAL WORK AND DO NOT DISTURB ANY DUCTS, PLUMBING, ELECTRICAL WORK, WALLS, CEILING, PARTITIONS OR FLOORS. MECHANICAL AND ELECTRICAL WORK DISTURBED OR REMOVED AS A RESULT OF PERFORMING REQUIRED NEW WORK SHALL BE REFINISHED AND LEFT IN AS GOOD CONDITION AS EXISTED BEFORE COMMENCING WORK. EXISTING WORK TO BE ALTERED OR EXTENDED AND THAT IS FOUND TO BE DEFECTIVE IN ANY WAY, SHALL BE REPORTED TO THE ARCHITECT BEFORE IT IS DISTURBED. MATERIALS AND WORKMANSHIP USED IN RESTORING WORK, SHALL CONFORM IN TYPE AND QUALITY TO THAT OF ORIGINAL EXISTING CONSTRUCTION, EXCEPT AS OTHERWISE SHOWN OR SPECIFIED.
5. ALL SERVICE LINES SUCH AS WIRES, CABLES, CONDUITS, DUCTS, PIPES AND THEIR HANGERS OR SUPPORTS, WHICH ARE TO BE ABANDONED BUT ARE NOT REQUIRED TO BE ENTIRELY REMOVED SHALL BE SEALED, CAPPED OR PLUGGED IN CEILINGS, WITHIN FURRED SPACES, IN UNFINISHED AREAS, OR WITHIN WALL OR PARTITIONS SO THAT THEY ARE COMPLETELY BEHIND PLASTERED AREAS, OR OTHER FINISHED SURFACES. ABANDONED LINES MUST BE CAPPED AT BOTH ENDS, SO THAT NO DEAD ENDS ARE LEFT.
6. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ALL EXISTING CONSTRUCTION, INCLUDING EXISTING TO REMAIN AND TO BE REMOVED. ITEMS AND DEBRIS TO BE REMOVED WILL BE PROPERLY DISPOSED OF BY THE CONTRACTOR, WITHIN HIS CONTRACT, AT NO COST TO THE OWNER.
7. CONTRACTOR SHALL PROVIDE DURING DEMOLITION OPERATIONS ALL SAFETY MEASURES AND FEATURES AS REQUIRED BY THE APPLICABLE CODES, RULES AND REGULATIONS HAVING JURISDICTION OVER THE PROJECT.
8. THE DEMOLITION DRAWINGS ARE ONLY TO ASSIST IN SHOWING THE SCOPE OF DEMOLITION WORK AND ARE NOT INTENDED TO INDICATE ALL DEMOLITION. CONTRACTOR SHALL REMOVE ALL EXISTING ITEMS AS REQUIRED TO PROPERLY COMPLETE ALL THE WORK INDICATED IN THE CONTRACT DOCUMENTS.
9. ANY UTILITY LINES TO REMAIN AND THAT ARE BROKEN OR DAMAGED DURING DEMOLITION OPERATIONS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL CHARGE TO THE CONTRACT PRICE.
10. HOLES AND OPENINGS ON THE BUILDING CEILING SLAB AND WALLS THAT REMAIN AFTER THE DEMOLITION SHALL BE PATCHED TO MATCH THE EXISTING CEILING SLAB AND WALL CONSTRUCTION.
11. ALL WORK SHALL BE COORDINATED WITH ALL OTHER TRADES AT JOB SITE PRIOR TO FABRICATION AND INSTALLATION OF EQUIPMENT. ANY DISCREPANCIES BETWEEN THE WORK DEPICTED ON THESE DOCUMENTS AND THE ACTUAL CONDITIONS ENCOUNTERED SHALL BE BROUGHT PROMPTLY TO THE ENGINEER FOR REVIEW AND CLARIFICATION.

EQUIPMENT DESIGNATION

- CH - # : AIR COOLED CHILLER, EQUIPMENT NO.
- AHU-# : AIR HANDLING UNIT, EQUIPMENT NO.
- CHWP-# : CHILLED WATER PUMP, EQUIPMENT NO.
- EF-# : EXHAUST FAN, EQUIPMENT NO.

35. CUT ALL OPENINGS REQUIRED TO ACCOMMODATE THE WORK UNDER THIS CONTRACT AND REPAIR ALL WALLS, ROOF, ETC. DAMAGED BY SUCH CUTTINGS.
36. FILTERS FOR AHU'S SHALL BE IN PLACE DURING CONSTRUCTION, AND A NEW SET SHALL BE PROVIDED BY THE CONTRACTOR PRIOR TO TEST AND BALANCE.
37. PROVIDE DIELECTRIC FITTINGS AND COUPLINGS AT ALL PIPING CONNECTIONS BETWEEN DISSIMILAR METALS.
38. PIPING SHALL BE IDENTIFIED WITH PRE-PRINTED, COLOR-CODED MANUFACTURED PIPE MARKERS WITH SELF ADHESIVE. THESE MARKERS SHALL HAVE LETTERING INDICATING SERVICE AND SHALL SHOW DIRECTION OF FLOW. SERVICE ABBREVIATIONS AND COLORS PER INDUSTRY STANDARDS.
39. ALL NEW EQUIPMENT SHALL BE IDENTIFIED WITH THE SAME DESIGNATION SHOWN ON THE DRAWINGS. IDENTIFICATION SHALL BE WITH ENGRAVED PLASTIC NAMEPLATES USING 1" LETTERS. NAMEPLATES SHALL BE MINIMUM 4"X2" IN SIZE. LETTERS SHALL BE WHITE AND PLATE BACKGROUND SHALL BE BLACK

HVAC DESIGN REQUIREMENTS

	YES	NO
DUCT SMOKE DETECTOR		X
FIRE DAMPER(S)		X
SMOKE DAMPER(S)		X
FIRE RATED ENCLOSURE		X
FIRE RATED ROOF/FLOOR CEILING ASSEMBLY		X
FIRE STOPPING		X
SMOKE CONTROL		X

AIR DISTRIBUTION LEGEND

DOUBLE WALL INSULATED DUCT	DIRECTION OF FLOW; TYPE OF DIFFUSER; SIZE OF DIFFUSER; AMOUNT OF CFM (A 1W, 6X6, 150)
DUCT: FIRST FIGURE IS SIDE SHOWN. SIZES ARE INSIDE DIMENSION. (20 X 10)	
OVAL DUCT (20 X 10 Ø)	SECTION NUMBER; DRAWING NUMBER WHERE LOCATED
ROUND DUCT (20 Ø)	DUCT MTD. SMOKE DETECTOR W/REMOTE & TEST LIGHT SWITCH (PROVIDE ACCESS DOOR) (AD, SD)
EXISTING DUCTWORK OR EQUIPMENT TO REMAIN	ACCESS PANEL/DOOR (AP, AD)
EXISTING DUCTWORK OR EQUIPMENT TO BE REMOVED	FLEXIBLE DUCT; FLEXIBLE CONNECTION (FC)
DUCT RISE IN DIRECTION OF FLOW (R)	ELECT. STRIP HEATER (MUST USE ACC. DOOR) (AD, EDH)
DUCT DROP IN DIRECTION OF FLOW (D)	FAN; WALL; ROOF
TRANSITION RECTANGULAR TO ROUND	UNDERCUT DOOR (U.C.)
DUCT WITH CAPPED END	AIR FLOW MEASURING DEVICE (A.F.M.D.)
DUCT SECTION: SUPPLY & RETURN	THERMOSTAT (T)
ALL ELBOWS MUST BE PROVIDED WITH TURNING VANES WHETHER SHOWN OR NOT ON DWGS.	HUMIDISTAT (H)
TYP. 45 DEG TAP -OFF WITH VOLUME DAMPER (VD)	POINT OF CONNECTION BETWEEN NEW AND EXISTING WORK
MOTORIZED DAMPER WITH ACCESS DOOR (M)	CAP
SPLITTER DAMPER	DEMOLITION TO THIS POINT
FIRE DAMPER (MUST USE ACCES DOOR) (A.D, F)	COMBINATION FIRE/SMOKE DAMPER (MUST USE ACCESS DOOR) (A.D, FS)
SMOKE DAMPER (MUST USE ACCESS DOOR) (A.D, S)	RADIATION FIRE DAMPER (A.D, R)

NOTES

1. 45 DEG TAP-OFFS, SPLITTERS AT EACH TAP-OFF AND TEE, AND ACCESS DOORS SHALL BE USED WHERE REQUIRED, WHETHER OR NOT INDICATED IN THE DRAWINGS.
2. IN AREAS WHERE NON-REMOVABLE CEILINGS ARE USED, PROVIDE 45 DEG TAP-OFFS OF THE FIXED TYPE, WITH WIDTH PROPORTIONAL TO BRANCH CFM.

EQUIPMENT SPECIFICATIONS:

SUPPLY AND RETURN AIR DUCTWORK: SHALL BE CLASS I GLASS FIBER DUCTBOARD (1-1/2" THICK, R-6 MIN.) IN ACCORDANCE WITH THE LATEST SMACNA'S FIBROUS DUCT CONSTRUCTION STANDARDS.

EXHAUST AND OUTSIDE AIR DUCTWORK: SHALL BE GALVANIZED SHEET STEEL, 26 Ga MIN, DESIGNED, CONSTRUCTED AND INSTALLED PER 3" STATIC PRESSURE CLASSIFICATION OF THE SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS- METAL AND FLEXIBLE" MANUAL, LATEST EDITION.

EXTERNAL DUCTWORK INSULATION: SHALL BE 2.2 INCH THICK, 3/4 PCF DENSITY FIBERGLASS BLANKET WITH UL APPROVED ALUMINUM FOIL VAPOR SEAL JACKET REINFORCED WITH FIBERGLASS SCRIM, LAMINATED TO 30 LB. KRAFT PAPER, R = 6.0 MINIMUM. JACKET TO BE LAPPED NOT LESS THAN TWO INCHES AT ALL JOINTS AND SEAMS, AND SEALED WITH A VAPOR-RETARDER MASTIC. INSTALLED THICKNESS OF INSULATION SHALL NOT BE LESS THAN TWO INCHES.

INSULATE THE FOLLOWING DUCT SYSTEMS: INDOOR CONCEALED SUPPLY, RETURN AND OUTSIDE AIR DUCTWORK, INDOOR EXPOSED SUPPLY, RETURN AND OUTSIDE DUCTWORK.

FLEXIBLE DUCTWORK: SHALL BE CLASS 1 STANDARD 181, INSULATED ROUND DUCT BY THERMAFLEX MKE ATCO MH9596, ATCO ESR 1268 OR FLEXMASTER 8M, R-6 MINIMUM. FACTORY FABRICATED WITH AN OUTER JACKET ENCLOSING 1-1/2 INCH THICK GLASS FIBER INSULATION AROUND A CONTINUOUS POLYETHYLENE FILM INNER LINER. STEEL WIRE HELIX REINFORCEMENT ENCAPSULATED AROUND INNER LINER. GLASS-REINFORCED SILVER MYLAR OUTER JACKET WITH A CONTINUOUS HANGING TAB. FLEXIBLE DUCT SHALL MEET THE REQUIREMENTS OF FLORIDA BUILDING CODE 2020.

ROUND MANUAL VOLUME DAMPERS: SHALL BE RUSKIN MODEL MDRS25 OR EQUAL, FURNISHED COMPLETE WITH FACTORY FABRICATED LOCKING HAND QUADRANT. PROVIDE WITH 2" STAND-OFF WHEN INSTALLED ON EXTERNALLY INSULATED DUCT.

RECTANGULAR MANUAL VOLUME DAMPERS: SHALL BE RUSKIN MODEL MD35 OR EQUAL. MULTIPLE OPPOSED BLADE OR SINGLE BLADE, FURNISHED COMPLETE WITH FACTORY FABRICATED LOCKING HAND QUADRANT. PROVIDE WITH 2" STAND-OFF WHEN INSTALLED ON EXTERNALLY INSULATED DUCT.

DUCT SUPPORTS: SHALL BE GALVANIZED SHEET STEEL STRAP. WIDTH, GAGE AND SUPPORT INTERVALS PER SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE" MANUAL, LATEST EDITION.

REFLECTED CEILING COORDINATION:

CONTRACTOR SHALL COORDINATE FINAL LOCATION OF ALL CEILING MOUNTED FIXTURES, OUTLETS, DEVICES AND/OR EQUIPMENT SHOWN IN THESE ENGINEERING DRAWINGS WITH THE ARCHITECTURAL REFLECTED CEILING PLANS AND/OR APPLICABLE DETAIL DRAWINGS AS WELL AS WITH THE EXISTING FIELD CONDITIONS. ANY DISCREPANCY AND/OR CONFLICT MUST BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH ANY ROUGH-IN WORK.

PROJ. No. 30056 CA 924

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HVAC SEQUENCE OF OPERATIONS:

FAN OPERATION AND CONTROL:

NEW SUPPLY FANS ARE TO BE INTERLOCKED WITH THEIR RESPECTIVE AHU AS REQUIRED BY THE FAN SCHEDULE. EXISTING EXHAUST FANS ARE TO BE AUTOMATICALLY STARTED OR STOPPED DURING OCCUPPIED OR UNOCCUPIED PERIODS BY THE BUILDING AUTOMATION SYSTEM'S (BAS) DIRECT DITIGAL CONTROLLER (DDC) ACCORDING TO MENU DRIVEN, ADJUSTABLE, WEEKLY SCHEDULING PROGRAM, WHEN THE 'H-O-A' STARTER SWITCH (WHICH MUST BE PROVIDED TO ALL THESE EXISTING FANS) IS IN THE 'AUTO' POSITION.

AIR HANDLING UNIT (AHU) OPERATION AND CONTROL:

THE INTERNAL CALENDAR AND TIME CLOCK OF THE BUILDING AUTOMATION SYSTEM WILL DETERMINE THE AHU(S) RUN TIME. UPON PROOF OF SUCCESSFUL START AND OPERATION OF THE AIR HANDLING UNITS, THE AUTOMATIC CONTROLS ARE PLACED INTO OPERATION MODULATING THE CHILLED WATER COIL VALVE TO MAINTAIN A SET AIR LEAVING AIR TEMPERATURE CONDITION FROM THE AHU OF 55F (ADJUSTABLE). THE FAN SPEED IS TO BE MODULATED THROUGH THE VARIABLE FREQUENCY DRIVE (VFD) TO MAINTAIN A SPACE TEMPERATURE OF 75F (ADJUSTABLE). WHEN THE SCHEDULED AIR HANDLING UNITS ARE FIRST STARTED [THIRTY (30) MINUTES (ADJUSTABLE) PRIOR TO THE OPENING OF THE BUILDING], THE OUTSIDE AIR SUPPLY FANS AND EXHAUST AIR FANS AND ASSOCIATED MOTORIZED DAMPERS SHALL REMAIN CLOSED/OFF TO ALLOW FOR SPACE DEHUMIDIFICATION. HUMIDITY LEVEL READINGS SHALL BE OBTAINED BY SOFTWARE CALCULATING THE DRY BULB TEMPERATURE SENSOR AND THE DEW POINT TEMPERATURE SENSOR IN THE MAIN AIR HANDLING UNIT RETURN AIR DUCT AND BY WALL MOUNTED HUMIDITY SENSORS LOCATED IN HIGH OCCUPANT DENSITY AREAS (REFER TO FLOOR PLANS FOR LOCATION). ONCE THE BUILDING IS SCHEDULED FOR OPENING, THE OUTSIDE AIR SUPPLY FANS/DAMPERS, AND THE EXHAUST AIR FAN(S)/DAMPERS, SHALL TURN ON/OPEN TO PROVIDE THE REQUIRED AIRFLOW RATES OF OUTSIDE AND EXHAUST AIR. ACTUAL AMOOUNTS OF OUTSIDE AIR WILL BE SELECTED BASED ON A DEMAND CONTROL VENTILATION (DCV) SYSTEM SET BY EACH OF THE INDIVIDUAL CARBON DIOXIDE (CO2) SENSOR READINGS. WHEN ANY AIR HANDLING UNIT IS STOPPED, ITS RELATED AUTOMATIC OUTSIDE AIR MODULATING DAMPERS, EXHAUST AIR FAN(S), AND THE CHILLED WATER COIL VALVES SHALL BE DRIVEN CLOSED.

OUTSIDE AIR SECTION CONTROL:

THE OUTSIDE AIR PROVISIONS SYSTEM DESIGN REQUIRES THAT OUTSIDE AIR IS PROVIDED INTO THE AIR CONDITIONING SYSTEM THROUGH EACH AIR HANDLING UNIT.

MINIMUM AMOUNTS OF OUTSIDE AIR, MEASURED BY OUTSIDE AIR AIRFLOW MONITORING STATIONS, WILL BE SET TO PROVIDE ½ OF THE MINIMUM OUTSIDE AIR REQUIREMENTS LISTED IN THE CONTRACT DOCUMENTS (AIR HANDLING UNIT SCHEDULE AND OUTSIDE AIR CALCULATION) DURING NORMAL OPERATION MODE. HOWEVER, IF CARBON DIOXIDE (CO2) LEVELS WITHIN THE BUILDING RISE ABOVE 900 PPM (ADJUSTABLE) AS A RESULT OF AN INCREASE OF OCCUPANTS, THE OUTSIDE AIR FLOW RATES WILL BE SET TO GRADUALLY INCREASE (BY INCREASING THE SPEED OF THE OUTSIDE AIR SUPPLY FAN VFDS) TO THE REQUIRED OUTSIDE AIR LEVELS. THE LEVELS OF CO2 WITHIN THE BUILDING ARE TO BE CONSTANTLY MONITORED BY CO2 SENSORS LOCATED IN EACH AIR HANDLER UNIT MAIN RETURN AIR DUCT. IN ADDITION TO THE RETURN OF THE AIR DUCT MOUNTED CO2 SENSORS, INDIVIDUAL MOUNTED CO2 SENSORS SHALL BE PROVIDED IN ALL AREAS WHERE THE OCCUPANCY DENSITY IS EQUAL OR MORE THAN 25 PEOPLE PER 1000 SF (REFER TO FLOOR PLANS AND OUTSIDE AIR CALCULATIONS FOR LOCATION REQUIREMENTS). WHEN THE CO2 LEVELS WITHIN ANY OF THESE ROOMS RISE ABOVE 900 PPM (ADJUSTABLE) AND THE SUPPLY FANS SPEED IS SET TO PROVIDE ½ OF THE MINIMUM OUTSIDE AIR REQUIREMENTS, THE CURRENT CONTROL SEQUENCE SHALL BE RESET SO THE SPEED OF THE OUTSIDE AIR INTAKE FANS INCREASE UNTIL THE AIRFLOW MONITORING STATIONS READ MATCH THE READ VALUES WITH THE OUTSIDE AIR INTAKE VALUES LISTED IN THE AIR HANDLING UNIT SCHEDULE.

A CO2 SENSOR WILL BE LOCATED AT EACH OUTSIDE AIR INTAKE OF EVERY AIR HANDLING UNIT. IF THESE SENSORS READ VALUES THAT CREATED A 700 PPM (ADJUSTABLE) DIFFERENCE BETWEEN THE EXTERIOR AND INTERIOR READINGS (EXTERIOR - INTERIOR > 700 PPM), THEN THE OUTSIDE AIR INTAKE WILL BE SET TO DELIVER ONE HALF OF THE VALUES SCHEDULED IN THE CONTRACT DOCUMENTS REGARDLESS OF THE MEASURED VALUES OF CO2 WITHIN THE SPACE. WHEN THE DIFFERENCE BETWEEN THE OUTSIDE AND INSIDE AIR CO2 SENSOR READING LEVELS (OUTSIDE - INSIDE IS LESS THAN OR EQUAL TO 700 PPM) (ADJUSTABLE), THEN THE OUTDOOR AIR DELIVERY SYSTEM WILL BE SET TO "NORMAL" OPERATION MODE. THIS OVERRIDE SEQUENCE IS REQUIRED TO PREVENT FURTHER CONTAMINATION OF THE SPACE IF THE OUTSIDE AIR CO2 LEVELS ARE MORE THAN THE INTERIOR LEVELS (TYPICAL DURING HEAVY TRAFFIC PERIODS).

EACH OUTSIDE AIR DUCTWORK DEDICATED TO EACH HANDLING UNIT MUST BE PROVIDED WITH AN AIRFLOW MONITORING STATION TO BE ABLE TO CONSTANTLY MONITOR AND CONTROL THE AMOUNTS OF OUTSIDE AIR FLOW RATES PROVIDED.

SUPPLY AIR TEMPERATURE CONTROL:

COOLING MODE [SPACE TEMPERATURE OF 72.5F (ADJUSTABLE) AND ABOVE]:

COOLING MODE SHALL BE ENABLED WHEN THE SINGLE ZONE VFD SERVING THE AFFECTED UNIT IS BETWEEN 100% AND MINIMUM LOAD (*). THE SUPPLY AIR TEMPERATURE, MEASURED BY A DDC CONTROLLED TEMPERATURE SENSOR LOCATED DOWNSTREAM OF EACH AIR HANDLING UNITS MAIN COOLING COIL, SHALL BE MAINTAINED AT CONSTANT DISCHARGE TEMPERATURE OF 55F (ADJUSTABLE). THE TEMPERATURE SHALL BE FINE TUNED BY ADJUSTING THE CHILLED WATER TWO-WAY MODULATING VALVE. THE DISCHARGE TEMPERATURE WILL GRADUALLY RESET UPWARDS TO A MAXIMUM OF 58F (ADJUSTABLE), THROUGH THE DDC CONTROLLER, IF THE MAIN RETURN AIR TEMPERATURE FALLS BELOW 70F AND THE AHU FAN IS AT ITS MINIMUM SETPOINT. IF SPACE TEMPERATURE DOES NOT INCREASE AS A RESULT OF THE ABOVE TEMPERATURE RESET SEQUENCE, HOT WATER RE-HEAT VALVE WILL FULLY OPEN WHILE FURTHER LOWERING THE VFD LOAD. IF SPACE TEMPERATURE REACHES OR IS LOWER THAN 67.5F, AFTER VFD SPEED IS AT MINIMUM LOAD (*), HEATING MODE (DESCRIBED BELOW) WILL BE ENABLED IN THE SPECIFIC ZONE. THE REVERSE WILL OCCUR (SWITCHING BACK TO COOLING MODE) WHEN SPACE TEMPERATURE RISES ABOVE SETPOINT. WHEN ANY DUCT HEATER IS ENERGIZED WHILE THE CHILLER IS ENERGIZED, THE CONTROL SYSTEM, THROUGH THE CHILLER'S PERCENT CAPACITY CONTROL MODULE, SHALL PREVENT THE CHILLER FROM ENERGIZING MORE THAN (2) COMPRESSORS.

HEATING MODE [SPACE TEMPERATURE AT 67.5F (ADJUSTABLE) AND BELOW]:

HEATING MODE SHALL BE ENABLED WHEN THE SINGLE ZONE VFD SERVING THE AFFECTED UNIT IS AT MINIMUM LOAD (*). THE SUPPLY AIR TEMPERATURE, MEASURED BY A DOC CONTROLLED TEMPERATURE SENSOR LOCATED DOWNSTREAM OF EACH AIR HANDLING UNITS MAIN COOLING COIL, SHALL BE RESET UPWARDS AT A CONSTANT DISCHARGE TEMPERATURE OF 58F (ADJUSTABLE). THE TEMPERATURE SHALL BE FINE TUNED BY ADJUSTING THE CHILLED WATER TWO-WAY MODULATING VALVE. IF SPACE TEMPERATURE DOES NOT INCREASE AS A RESULT OF THE ABOVE TEMPERATURE RESET SEQUENCE, HOT WATER RE-HEAT VALVE WILL FULLY OPEN. IF SPACE TEMPERATURE DOES NOT INCREASE TO SETPOINT, SCR HEATERS SHALL GRADUALLY ENERGIZE. THE REVERSE WILL OCCUR (SWITCHING BACK TO COOLING MODE) WHEN SPACE TEMPERATURE RISES ABOVE SETPOINT. WHEN ANY DUCT HEATER IS ENERGIZED WHILE THE CHILLER IS ENERGIZED, THE CONTROL SYSTEM, THROUGH THE CHILLERS PERCENT CAPACITY CONTROL MODULE, SHALL PREVENT THE CHILLER FROM ENERGIZING MORE THAN TWO (2) COMPRESSORS.

DEHUMIDIFICATION CONTROL SEQUENCE:

IF THE RETURN AIR RELATIVE HUMIDITY EXEEDS 55% (ADJUSTABLE) AND THE RETURN AIR TEMPERATURE IS ABOVE 74F (ADJUSTABLE), THE DOC CONTROLLER WILL RESET THE SUPPLY AIR TEMPERATURE DOWNWARDS TO 52F (ADJUSTABLE) WHILE OPENING THE REHEAT COIL VALVE TO INCREASE DEHUMIDIFICATION. SCR HEATER WILL GRADUALLY ENERGIZE WHEN RETURN AIR TEMPERATURE REACHES 70F (ADJUSTABLE) TO PREVENT OVERCOOLING OF SPACE. SCR HEATERS SHALL ENERGIZE ONLY AFTER HOT-WATER REHEAT VALVE IS CONFIRMED TO BE FULLY OPEN AND AHU FAN SPEED IS AT ITS MINIMUM LOAD (*).

UNOCCUPIED HUMIDITY / TEMPERATURE OVERRIDE ROUTINE:

THE UNOCCUPIED HUMIDITY / TEMPERATURE OVERRIDE ROUTINE WILL START, BY ENABLING "ON" THE AIR CONDITIONING UNITS (AS DESCRIBED IN THE PARAGRAPH BELOW). WHEN THE HUMIDITY / TEMPERATURE IN THE ZONE SERVED BY ANY AIR HANDLING UNIT EXCEEDS 55% (ADJUSTABLE) AND/OR 82F RESPECTIVELY (ADJUSTABLE), AT A MINIMUM OF TWO (2) SPACE HUMIDITY / TEMPERATURE SENSORS (ADJUSTABLE) LOCATED WITHIN THE SAME ZONE OR ONE (1) SPACE HUMIDITY SENSOR AND THE AIR HANDLING UNIT RETURN AIR HUMIDITY CONDITIONS (SOFTWARE CALCULATED BY MEASURING OF THE DRY BLUB AND THE DEW POINT TEMPERATURE).

THE SUPPLY AIR OF THE AIR HANDLING UNIT SERVING THE AFFECTED ZONE SHALL BE RESET TO 52F (ADJUSTABLE) WHILE OPENING THE REHEAT COIL VALVE TO INCREASE DEHUMIDIFICATION. THE OUTSIDE AIR SUPPLY FANS AND THE EXHAUST AIR FANS SERVING THE BUILDING SHALL REMAIN TURNED OFF DURING THE OFF-HOURS HUMIDITY / TEMPERATURE OVERRIDE ROUTINE.

CHILLED WATER SYSTEM:

THE BUILDING HAS BEEN PROVIDED WITH TWO (2) CHILLED WATER PUMPS. ONE OF THE PUMPS TO BE ON STAND-BY MODE AT ALL TIMES. CHILLER CONTROLLER TO ALTERNATE LEAD/LAG PUMPS IN A MANNER TO EQUALIZE OPERATIONAL RUNNING TIME BETWEEN THEM ALL. CHILLER CONTROLLER WILL SEND SIGNAL TO ENERGIZE PUMP BASED TOD SCHEDULE. BAS TO ENSURE THAT ALL CHILLED WATER COIL VALVES SERVING THE AIR HANDLING UNITS ARE FULLY OPEN BEFORE LEAD CHILLED WATER PUMP ENERGIZES.

HOT WATER SYSTEM:

THIS BUILDING HAS BEEN PROVIDED WITH (1) HOT WATER PUMP.

THE BUILDING AUTOMATION SYSTEM SHALL ENABLE "ON" THE HOT WATER PUMP WHEN FOR OPERATION A MINIMIM OF FIFTEEN (15) SECONDS (ADJUSTABLE) AFTER ANY THREE-WAY RE-HEAT WATER COIL VALVE OF ANY AIR HANDLING UNIT OPENS AND 15 SECONDS BEFORE CHILLER ENERGIZES (IF CHILLER IS DE-ENERGIZED AT THE TIME HOT WATER REHEAT IS REQUIRED).

ZONE TEMPERATURE CONTROL:

A ROOM TYPE WALL MOUNTED TEMPERATURE/HUMIDITY COMBINATION SENSOR, THOROUGH A DDC CONTROLLER, SHALL MODULATE THE APPLICABLE AIR HANDLING UNIT FAN SPEED AND, IF REQUIRED, GRADUALLY ENERGIZE THE SCR LEVELS OF HEATING TO MAINTAIN ZONE TEMPERATURE SET POINT WHILE OCCUPIED MODE. SCR DUCT HEATER SHALL ENERGIZE ONLY WHEN THE APPLICABLE HOT WATER RE-HEAT VALVE IS FULLY OPEN AND AHU FAN SPEED IS REDUCED (FAN SPEED IS CONTROLLED BY SPACE TEMPERATURE READING).

ONE WALL MOUNTED TEMPERATURE/HUMIDITY SENSORS SHALL BE PROVIDED PER SINGLE ZONE VFD HANDLING UNIT.

ALARM AND STAND-BY DEVICES SEQUENCE OF OPERATIONS:

WHEN THE CHILLER CONTROLLER SELECTED LEAD CHILLED WATER PUMP AND/OR HOT WATER PUMP (ONE HOT WATER PUMP PROVIDED) IS SCHEDULE TO OPERATE AND PROOF OF OPERATION IS NOT RECEIVED, THEN THE CHILLER CONTROLLER SHALL START THE SEQUENCE TO ENERGIZE THE RESPECTIVE CHILLED WATER STAND-BY PUMP. CHILLER CONTROLLER SHALL IMMEDIATELY GENERATE AND SEND AN ALARM SIGNAL TO THE BAS OPERATOR WORKSTATION AND ASSIGNED PERSONNEL INDICATING FAILURE OF AFFECTED MECHANICAL DEVICE.

BAS IS TO IMMEDIATELY SEND TO THE BAS OPERATOR WORKSTATION AND ASSIGNED PERSONNEL INDICATING FAILURE OF THE FOLLOWING BUT NOT LIMITED TO, DEVICES WHEN NO FEEDBACK IS RECEIVED AND/OR IS NOT RESPONDING TO CONTROL SIGNAL:

- GENERAL TYPE EXHAUST FAN (BY MEANS OF CURRENT METERS AND DP SWITCHES) - EXHAUST FAN ARE EXISTING.
- MOTORIZED DAMPER (BY MEANS OF END SWITCHES).
- FIRE/SMOKE DAMPERS (BY MEANS OF END SWITCHES). ALARM SHALL BE ALSO SENT TO FIRE ALARM PANEL.
- AUTOMATIC CHILLED AND HOT WATER VALVES [BY MEANS OF POSITION INDICATOR (VOLTAGE) FEEDBACK].
- FILTERS (BY MEANS OF DP SWITCHES).
- SENSORS (BY MEANS OF VOLTAGE FEEDBACK).
- HOT WATER PUMP (BY MEANS OF CURRENT METERS AND DP SWITCHES).
- CHILLER AND CHILLER COMPONENTS (BY MEANS OF CHILLER CONTROLLER).

(*) A MINIMUM LOAD IS DEFINED AS THE VFD SETPOINT WHERE THE AIR HANDLING UNITS DELIVER THE BELOW LISTED AIRFLOW RATES. T&B CONTRACTOR TO FIELD SELECT THIS VALUE AND TO COORDINATE WITH CONTROLS CONTRACTOR FOR IT'S PROPER PROGRAMMING INTO THE BUILDING'S AUTOMATIC CONTROL SYSTEM.

AHU-1: 1140 CFM AHU-2: 1385 CFM AHU-3: 945 CFM
AHU-4: 1010 CFM AHU-5: 800 CFM

TEST AND BALANCE GENERAL REQUIREMENTS:

THE COST OF THE BUILDING'S TEST AND BALANCE ARE TO BE INCLUDED AS PART OT THE ININTIAL BID PROECE, THE MECHANICAL CONTRACTOR SHALL ADDITIONALLY INCLUDE AN ALLOWANCE TO COVER (2) COMPLTE RE-TEST AND RE-BALANCE PROCESSES OF ALL SYSTEMS IN THE BUILDING IN ORDER TO ACCOMMODATE FINAL FINE-TUNING PROCEDURE OF DIFFERENT SYSTEMS.

TESTING, ADJUSTING, AND BALANCING HVAC SYSTEMS TO PRODUCE DESIGN OBJECTIVES, INCLUDING THE FOLLOWING:

1.BALANCING AIRFLOW AND WATER FLOW WITHIN DISTRIBUTION SYSTEMS, INCLUDING SUBMAINS, BRANCHES, AND TERMINALS, TO INDICATED QUANTITIES ACCORDING TO SPECIFIED TOLERANCES.
2.ADJUSTING TOTAL HVAC SYSTEMS TO PROVIDE INDICATED QUANTITIES.
3.MEASURING ELECTRICAL PERFORMANCE OF HVAC EQUIPMENT.
4.REPORTING RESULTS OF THE ACTIVITIES AND PROCEDURES SPECIFIED IN THIS SECTION.

TEST & BALANCE AGENCY SELECTION REQUIREMENTS:

THE T & B AGENCY WILL BE EMPLOYED DIRECTLY BY THE GENERAL CONTRACTOR WHO WILL BE SOLELY RESPONSIBLE FOR ITS PERFORMANCE AND THE TIMELY SCHEDULE OF ITS OPERATION. THE GC SHALL SOLICIT PROCES OF AT LEAST THREE TEST AND BALANCE AGENCIES FOR THE T&B WORK AND SHALL SUBMIT THE NAMES, PROCE QUOTES AND T&B COMPANY QUALIFICATIONS TO THE A/E AND OWNER/USER FOR FINAL SELECTION RECOMMENDATION WITHIN 45 DAYS OF AWARDING THE PROJECT. THE T&B OF ALL AIRSIDE AND WATERSIDE MECHANICAL EQUIPMENT SHALL BE DONE BY AN INDEPENDENT T&B AGENCY ACCEPTABLE BY THE BUILDING OWNER/USER AND A/E OF RECORD. NO PART OF THIS AGENCY CAN BE HELD BY ANY INDIVIDUALS OR FIRMS WHO HAVE A DIRECT INTEREST IN ANY CONTRACTUAL PORTION OF THIS PROJECT OR WHO ARE IN DIRECT COMPETITION WITH ANY OF THOSE WITH SUCH A CONTRACTUAL INTEREST. IT IS PREFERABLE, BUT NOT REQUIRED, THAT THE T&B AGENCY HAS A MINIMUM OF ONE FLORIDA LICENCED ENGINEER. IT IS REQUIRED, HOWEVER THAT THE T&B ENGINEER, RESPONSIBLE FOR SUPERVISION AND CERTIFICATION OF THE WORK SPECIFIED HEREIN, MUST BE CERTIFIED BY AABC OR NEBB.

CONTRACTOR IS TYO BE AWARE THAT VTHE TEST AND BALANCE REPORT MUST BE SUBMITTED FOR APPROVAL AT LEAST TEN (10) WEEKS PRIOR TO BUILDING'S FINAL MECHANICAL INSPECTION. THE T&B REPORT MUST BE APPROVED BY THE A/E OF RECORD (AND THE COMISSIONING AGENT, WHEN APPLICABLE) BEFORE THE MECHANICAL INSPECTOR'S FINAL INSPECTION.

THE ISD'S PROJECT MANAGER AND/OR THEIR REPRESENTATIVE SHALL BE PRESENT DURING THE TEST AND BALANCE PROCESS.

BELOW IS ALIST OF THREE (3) PRE-SELECTED RECOMMENDATIONS FOR TEST AND BALANCE FIRMS THAT COMPLY WITH THE ABOVE REQUIREMENTS:

-. INTEGRITY CONTROLS AND TEST AND BALANCE, INC; 786-287-4850. CONTACT PERSON: Mr. LUIS PRATS.

-. EARL HAGOOD, INC. (305) 266-7070, CONTACT PERSON: Mr. ROGER WHITE.

-. AIR LOGIC SERVICE, INC. (305) 971-9672, CONTACT PERSON: Mr. ROBERT BLANK.

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Qualifier: Erik Lloyd Myers
State of Florida: AR 93574

Sign & Seal: Eduardo A. Suarez P.E.
State of Florida: License No. 64759

EDUARDO ALBERTO SUAREZ LICENSE No. 64759 STATE OF FLORIDA PROFESSIONAL ENGINEER

OWNER:

Miami Lakes Branch Library
6699 Windmill Gate Road
Miami Lakes, FL 33014

TITLE: Notes - HVAC

REVISION

1	OWNER CHANGES	08/28/23

DATE
04-03-2023

PROJECT NUMBER
19119

SHEET NUMBER
M0.1

OF

PROJ. No. 30056 CA 924

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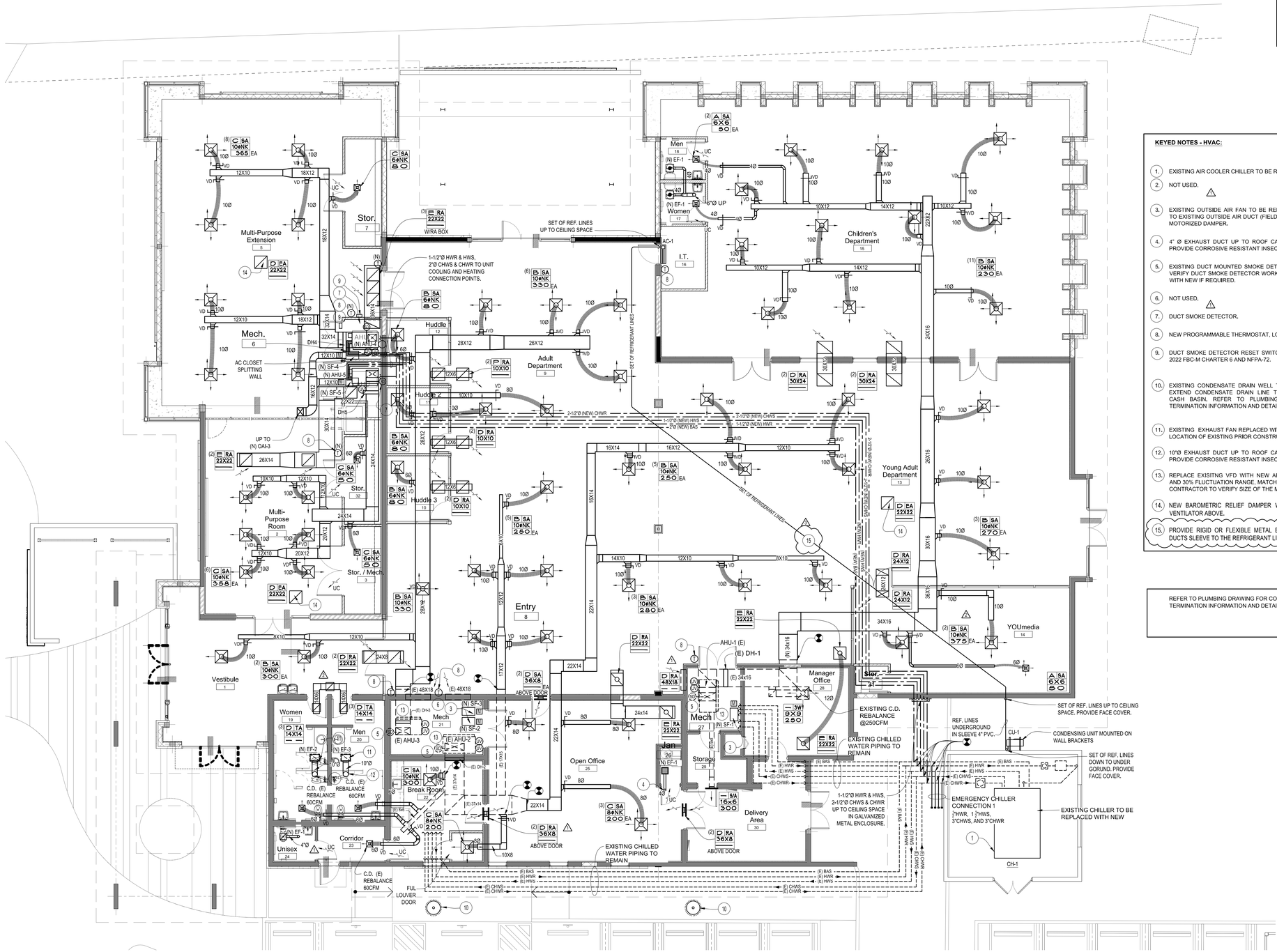

1 Floor Plan - HVAC
M3.0 Scale: 1/8" = 1'-0"

KEYED NOTES - HVAC:

1. EXISTING AIR COOLER CHILLER TO BE REPLACED WIT NEW.
2. NOT USED.
3. EXISTING OUTSIDE AIR FAN TO BE REPLACED, CONNECTING TO EXISTING OUTSIDE AIR DUCT (FIELD VERIFY), PROVIDE OA MOTORIZED DAMPER.
4. 4" Ø EXHAUST DUCT UP TO ROOF CAP WITH BIRDSCREEN. PROVIDE CORROSIVE RESISTANT INSECT SCREEN.
5. EXISTING DUCT MOUNTED SMOKE DETECTOR. CONTRACTOR VERIFY DUCT SMOKE DETECTOR WORK PROPERLY. REPLACE WITH NEW IF REQUIRED.
6. NOT USED.
7. DUCT SMOKE DETECTOR.
8. NEW PROGRAMMABLE THERMOSTAT, LOCATED 48" A.F.F.
9. DUCT SMOKE DETECTOR RESET SWITCH INSTALLED AS PER 2022 FBC-M CHARTER 6 AND NFPA-72.
10. EXISTING CONDENSATE DRAIN WELL TO BE REMOVED AND EXTEND CONDENSATE DRAIN LINE TO EXISTING PARKING CASH BASIN. REFER TO PLUMBING FOR C.D. LAYOUT TERMINATION INFORMATION AND DETAILS.
11. EXISTING EXHAUST FAN REPLACED WITH NEW. FIELD VERIFY LOCATION OF EXISTING PRIOR CONSTRUCTION.
12. 10"Ø EXHAUST DUCT UP TO ROOF CAP WITH BIRDSCREEN. PROVIDE CORROSIVE RESISTANT INSECT SCREEN.
13. REPLACE EXISITNG VFD WITH NEW ABB VFD WITH BYPASS AND 30% FLUCTUATION RANGE, MATCHING MOTOR CAPACITY. CONTRACTOR TO VERIFY SIZE OF THE MOTOR.
14. NEW BAROMETRIC RELIEF DAMPER WITH FABRA GRAVITY VENTILATOR ABOVE.
15. PROVIDE RIGID OR FLEXIBLE METAL ENCLOSURES OR PIPE DUCTS SLEEVE TO THE REFRIGERANT LINES.

REFER TO PLUMBING DRAWING FOR CONDENSATE PIPING TERMINATION INFORMATION AND DETAILS.

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EDUARDO ALBERTO SUAREZ LICENSE No. 64759 STATE OF FLORIDA PROFESSIONAL ENGINEER

OWNER:

Miami Lakes Branch Library

6699 Windmill Gate Road
Miami Lakes, FL 33014

TITLE: Floor Plan - HVAC

REVISION		
1	OWNER CHANGES	08/28/23
2	LEED COORDINATION	01/23/24
3	COORDINATION	03/26/25

DATE
04-03-2023

PROJECT NUMBER
19119

SHEET NUMBER
M3.0

OF

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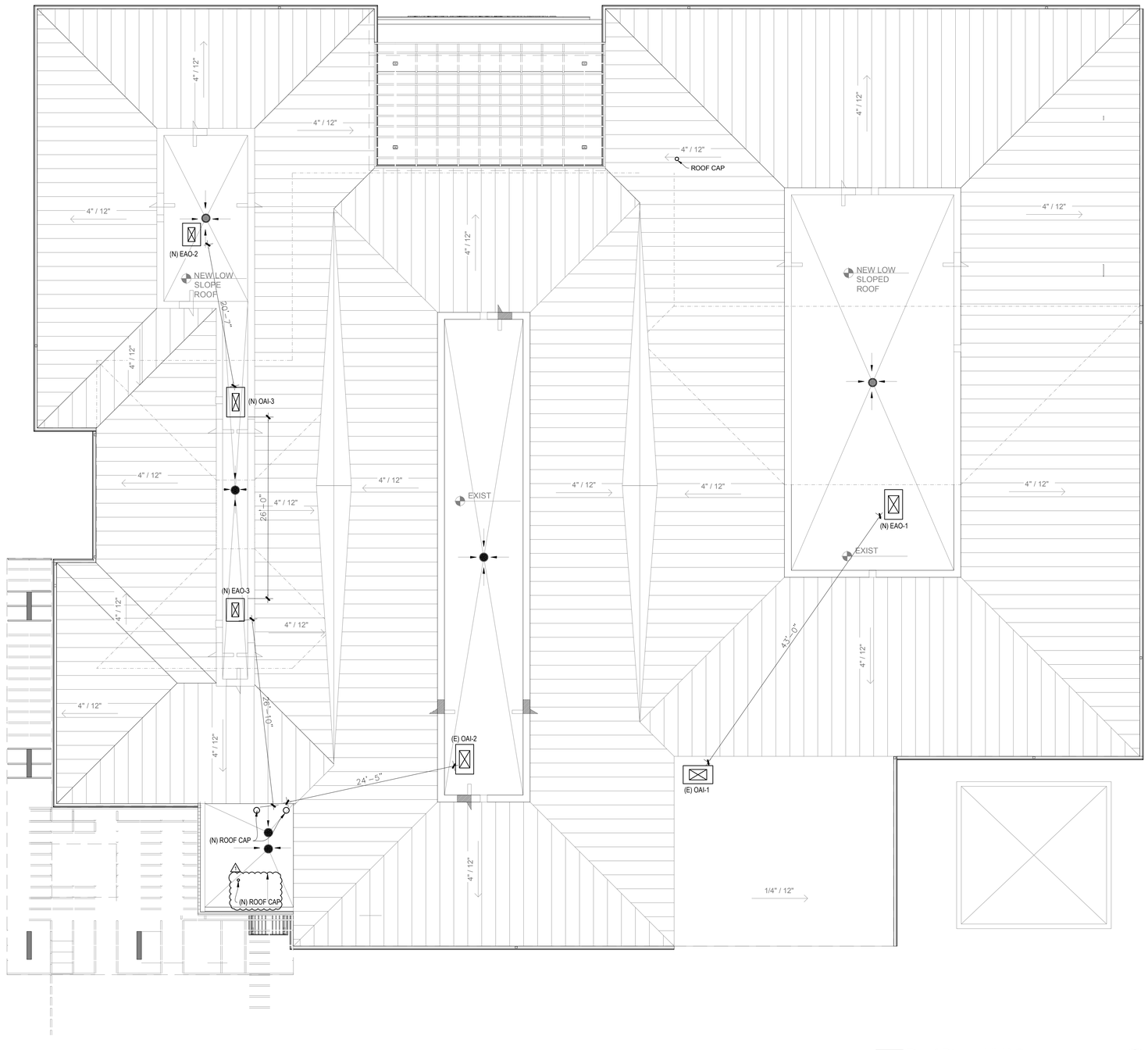

1 Roof Plan - HVAC
M3.1 Scale: 1/8" = 1'-0"

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REVISION
1 OWNER CHANGES 08/28/23

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SHEET NUMBER
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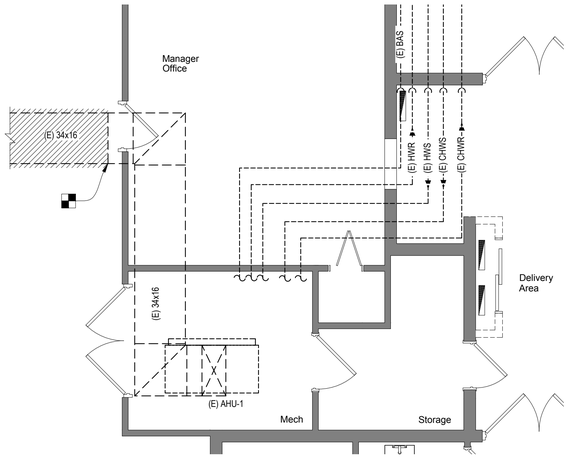
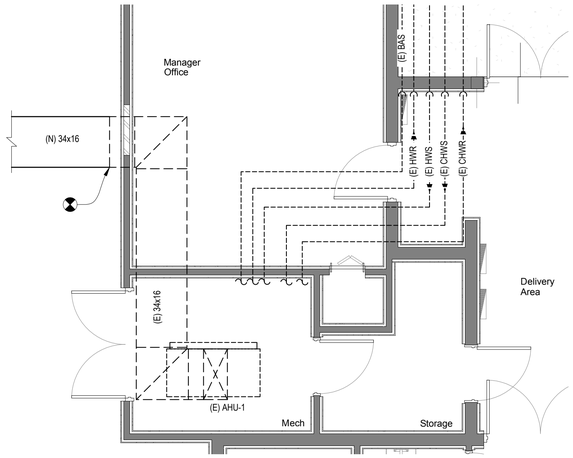
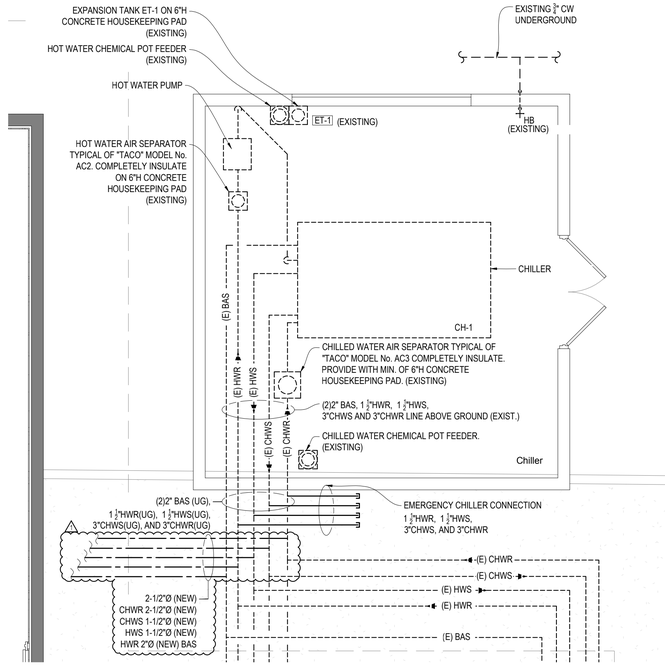
OF



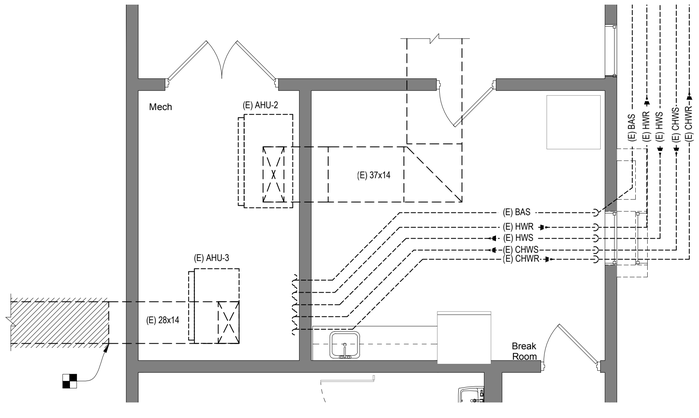
DEMOLITION
1 M4.0 Enlarged Floor Plan (AHU-1)- HVAC
Scale: 1/4" = 1'-0"



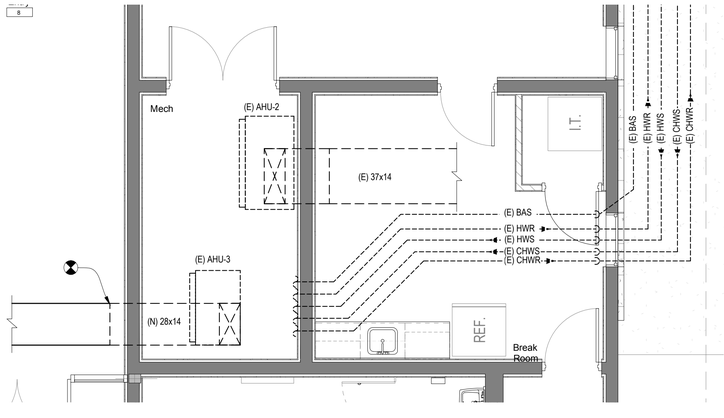
NEW WORK
2 M4.0 Enlarged Floor Plan (AHU-1)- HVAC
Scale: 1/4" = 1'-0"



NEW WORK
3 M4.0 Enlarged Chiller Yard Floor Plan - HVAC
Scale: 1/4" = 1'-0"



DEMOLITION
4 M4.0 ENLARGED FLOOR PLAN (AHU-2) (AHU-3)
Scale: 1/4" = 1'-0"



NEW WORK
5 M4.0 ENLARGED FLOOR PLAN (AHU-2) (AHU-3)
Scale: 1/4" = 1'-0"

PROJ. No. 30056 CA 924
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State of Florida: License No. 64759

EDUARDO ALBERTO SUAREZ LICENSE No. 64759 STATE OF FLORIDA PROFESSIONAL ENGINEER

OWNER:

Miami Lakes Branch Library
6699 Windmill Gate Road
Miami Lakes, FL 33014

TITLE: Enlarged Floor Plans - HVAC

REVISION
⚠ OWNER CHANGES 08/28/23

DATE
04-03-2023

PROJECT NUMBER
19119

SHEET NUMBER
M4.0

OF

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AIR HANDLING UNIT SCHEDULE

			(E) AHU-1	(E) AHU-2	(E) AHU-3	(N) AHU-4	(N) AHU-5
UNIT DESIGNATION							
LOCATION			MECHANICAL ROOM	MECHANICAL ROOM	MECHANICAL ROOM	MECHANICAL ROOM	MECHANICAL ROOM
UNIT TYPE			VERTICAL DRAW-THRU	VERTICAL DRAW-THRU	VERTICAL DRAW-THRU	VERTICAL DRAW-THRU	VERTICAL DRAW-THRU
SYSTEM TYPE			CV △	CV	CV	CV	CV
FAN MODULE	DESIGN POINT	TOTAL AIR, CFM	4790	4620	set to 3150	3000	2250 △
		VENT AIR, CFM	1105	785	635	770	640
		EXTERNAL/TOTAL STATIC PRESS. INCHES OF H20	1.5 / 2.476	1.5 / 2.476	1.5 /2.367	1.5 / 2.602	1.5 / 2.384
		TYPE	FC	FC	FC	FC	FC
	MOTOR	DRIVE TYPE/MAX. FAN RPM	BELT/1230	BELT/1230	BELT/1398	BELT/1462	BELT/1385
		MOTOR TYPE	0DP-H EFF(VFD RATED)	0DP-H EFF(VFD RATED)	0DP-H EFF(VFD RATED)	0DP-H EFF(VFD RATED)	0DP-H EFF(VFD RATED)
		NOMINAL / 8HP	5 / 3.758	5 / 3.758	5 / 2.367	10.03 FLA	6.43 FLA
		MAX. SPEED RPM	1750	1750	1750		
		ELECTRICAL CHARACTERSTICS, V/0/Hz	230/3/60	230/3/60	230/3/60	230/3/60	230/3/60
COOLING COIL		NO. OF ROWS	6	6	6	6	6
		NO. OF FINS PER INCH	9	9	12	12	12
		FACE VELOCITY, FPM	474 △	474	474	393	400
		DESIGN AIR ACROSS COIL, CFM	4790	4620	3150	3000	2,250
		AIR PRESSURE DROP, INWG	0.663	0.663	0.663	0.619	0.642
		TOTAL CAPACITY, MBH	160.65	160.65	106.81	170.24	131.28
		SENSIBLE CAPACITY, MBH	117.79	117.79	80.35	94.73	66.65
		ENTERING WATER TEMP	44/10	44/10	44/10	44/10	44/10
		WATER FLOW, GPM	32	32	32	30.27	24.99
		WATER PRESSURE DROP FT. H20	3.08	3.08	3.08	0.619	3.62
		ENTERING AIR TEMPERATURE °F DB/°F WB	77.5 / 65.4	77.5 / 65.4	77.5 / 65.4	82.5 / 71.4	80.70/71.80
		LEAVING AIR TEMPERATURE °F DB/°F WB	54.35 / 53.88	54.35 / 53.88	54.35 / 53.88	54.0/53.9	54/53.9
		CONDESATE WATER PRODUCTION RATE, GPH	5.0	5.0	5.0		
HEATING COIL		NO. OF ROWS	1	1	1	1	1
		NO. OF FINS PER INCH	9	9	9	9	9
		FACE VELOCITY, FPM	431 △	431	431	454	400
		DESIGN AIR ACROSS COIL, CFM	4720	4620	3150	3,000	2,250
		AIR PRESSURE DROP, INWG	0.085	0.085	0.085	0.47	0.094
		TOTAL CAPACITY, MBH	74.94	74.94	74.94	64.68	46.69
		ENTERING WATER TEMP	120/15	120/15	120/15	120/15	120/15
		WATER FLOW, GPM	10	10	10	8.65	6.24
		WATER PRESSURE DROP FT. H20	1.38	1.38	1.38	0.47	0.33
		ENTERING AIR TEMPERATURE °F DB	55.0	55.0	55.0	55.0	55.0
		LEAVING AIR TEMPERATURE °F DB/	70.0	70.0	70.1	74.88	74.13
PRE-FILTER		FILTER TYPE	-	-	-	-	-
		DEPTH, INCHES	-	-	-	-	-
		P.D. INCHES H20, (MID-LIFE)	-	-	-	-	-
		EFFICIENCY	-	-	-	-	-
FILTER		FILTER TYPE	PLEATED	PLEATED	PLEATED	PLEATED	PLEATED
		DEPTH, INCHES	4"	4"	4"	4"	4"
		P.D. INCHES H20, (MID-LIFE)	0.229	0.220	0.182	0.169	0.161
		EFFICIENCY	MERV 13	MERV 13	MERV 13	MERV 13	MERV 13
WEIGHT			850	850	700	674	539
DESIGN MANUFACTURER			TRANE	TRANE	TRANE	TRANE	TRANE
DESIGN MFG. MODEL			UCCAD10A0	UCCAD10A0	UCCAD08A0	UCCCA08B0	UCCCA06B0
DUCT HEATER		KW	-	-	-	-	-
		STEPS	-	-	-	-	-
VFD WITH INTEGRAL DISCONNECT AND STARTER			YES	YES	YES	YES	YES
BIPOLAR IONIZATION MODULE			YES	YES	YES	YES	YES
MCA/MOCP						12.43/20	7.93/15

NOTES:
1. WATER COILS TO HAVE COPPER TUBES TO BE 1/2" AND 0.016 INCHES THICK ALUM. FINS.
2. AIR HANDLING UNITS TO BE SOLID DOUBLE WALL WITH 2" - 1.5 LB INSULATION "SANDWICHED" BETWEEN THE INTERNAL
3. FAN MOTOR BRAKE HORSE POWER SHALL NOT
4. ALL AHU'S SHALL BE EQUIPED WITH NEEDLEPOINT BIPOLAR IONIZATION COLD PLASMA "D6" BY "EAGLE X PRO". PLASMA UNIT SHALL BE POWERED BY AHU.
5. ALL AHU'S SHALL BE EQUIPED WITH UV LAMP "AIR SNIPER INDUCT 300W" BY "AIR SNIPER". PROVIDE SEPARATE SINGLE POINT CONNECTION.
6. FIVE (5) YEARS EXTENDED WARRANTY FOR THE ENTIRE UNIT (PARTS AND LABOR). INCLUDING EXISTING UNITS.

△ △

VENTILATION CALCULATIONS AS PER 2020 FBC-M TABLE 403.3.1.1

AC UNIT TAG / Space Name	Floor Area (ft²)	MAXIMUM OCCUPANTS (Pz)	Required O/A PER PERSON (Ra) (CFM/person)	Required O/A PER SQ.FT (Ra) (CFM/ft²)	Breathing Zone Outdoor Airflow (CFM)	Outside Air Provided (CFM)
AHU-1 - CHILDRENS DEPARTMENT	2627	32	6.50	0.16	618	
AHU-1 - YOUNG ADULT DEPARTMENT	920	12	6.50	0.16	222	
AHU-1 - YOUMEDIA	580	6	13.00	0.16	168	
AHU-1 - DIRECTOR'S OFFICE	231	1	6.50	0.08	25	
AHU-1 - STORAGE	255			0.08	20	
AHU-1	**4613.0**	**51.0**			**1,052**	**1,105**
AHU-2 & 3 - OPEN OFFICE	765	13	6.50	0.08	144	
AHU-2 & 3 - BREAK ROOM	209	8	6.50	0.08	68	
AHU-2 & 3 - RESTRM	423					
AHU-2 & 3 - OPEN AREA LIBRARY	4987	50	6.50	0.16	1,103	
AHU-2 & 3 - VESTIBULE 1	565	6	6.50	0.08	83	
AHU-2 AND AHU-3	**6949.0**	**77.0**			**1,399**	**785 / 635**
AHU-4 - MULTIPURPOSE EXTENSION	1663	96	6.50	0.08	754	
AHU-4 - STORAGE	100			0.08	8	
AHU-4	**1763.0**	**96.0**			**762**	**770**
AHU-5 - MULTIPUPOSE RM 2	687	75	6.50	0.08	541	
AHU-5 - STORAGE	169			0.08	13	
AHU-5	**856.0**	**75.0**			**554**	**640**

AIR DISTRIBUTION SCHEDULE

DESIGNATION	A	B	C	D	E
MANUFACTURER	METALAIRE	METALAIRE	METALAIRE	METALAIRE	METALAIRE
MODEL NO. AND / OR CATALOG NO.	L-S ALL ALUM.	5700-1 ALL ALUM.	5700-6 ALL ALUM.	RH-1 ALL ALUM.	RH-6 ALL ALUM.
FRAME TYPE	SURFACE	SURFACE	T-BAR LAY-IN	SURFACE △	T-BAR LAY IN
DEVICE TYPE	ADJUST BLADE	ROUND NECK 2 CONE SQUARE	ROUND NECK 2 CONE SCUARE	CEILING / SIDE WALL RETURN LOUVERED VANES	CEILING RETURN LOUVERED VANES
FUNCTION	SUPPLY	SUPPLY	SUPPLY	RETURN	RETURN
NECK SIZE	SEE DRAWINGS	SEE DRAWINGS	SEE DRAWINGS	SEE DRAWINGS	SEE DRAWINGS
PATTERN	SEE DRAWINGS	SEE DRAWINGS	SEE DRAWINGS	SEE DRAWINGS	SEE DRAWINGS
OPPOSED BLADE DAMPERS	YES	YES	YES	NO	NO
					

NOTES:
1. PROVIDE WITH AG-30 SINGLE BLADE DAMPER
2. ALL AIR DEVICES SHALL BE FULLY GASKETED.
3. UNLESS OTHERWISE NOTED, FINISH OF ALL AIR DEVICES SHALL BE BAKED OFF-WHITE.
4. FOR SQUARE NECK OUTLETS CONNECTED TO A ROUND FLEXIBLE OR RIGID DUCT, PROVIDE FACTORY FURNISHED SQUARE TO ROUND COLLAR.
5. MOUNTING BORDERS TO BE CONSISTENT WITH ACTUAL CEILING TYPE; COORDINATE WITH ARCHITECTURAL REFLECTED CEILING PLANS.
6. FOR LINEAR SLOT DIFFUSERS SHALL BE SET FOR HORIZONTAL AIR DISCHARGE PATTERN (UNLESS OTHERWISE NOTED ON PLANS) BY CONTRACTOR UPON COMPLETION OF INSTALLATION AND PRIOR TO TEST AND BALANCE. SET THE PATTERN CONTROLLERS TO DISCHARGE IN THE DIRECTION OF THE OPEN SPACE. PROVIDE WITH FACTORY FURNISHED INSULATED SHEET METAL PLENUM. LINEAR SLOTS USED FOR RETURN SERVICE SHALL ALSO BE PROVIDED WITH PATTERN CONTROLLERS TO BALANCE AESTHETICS.
7. PROVIDE MANUAL DAMPER MODEL RUSKIN CD50 BEHIND THE LOUVER IN COMPLIANCE WITH AMCA-550 FOR ENCLOSURED SPACE WHERE WATER PENETRATION IS NOT ALLOW.

WATER PUMP SCHEDULE

Unit Designation		HWP – 1
Location		Chiller Yard
Pump Service		Hot Water Reheat
Pump Type		Inline
PERFORMANCE	Water Flow, GPM	21.4
	Total Dynamic Head, Ft. of Water	55
	Pump Speed, RPM (Max)	3450
	Design Efficiency, % (Min.)	48.3
	Design Pressure, PSIG	125
	Impeler Diameter, In.	3.875
	Absorbed Power, BHP	0.647
MOTOR	Motor Type	T.E.F.C.- HI-EFF. (VFD)
	Motor Size, HP	1.5
	Electrical Service Available	208V/3ø/60 Hz
Frame Size		-
Vibration Isolator Type		-
Min. Static Deflection, In.		-
Design Manufacturer & Model Number		B & G E-90 IAAB

Note:
1. Pump to be bronze fitted.
2. Pump absorbed brake horsepower shall not exceed 85% of the
3. Pump shall be provided with steel drip rim base plate.
4. Variable frequency drives to be provided with integral disconnect and starter. (Pump VFDs are to be used for balancing purposes only). Pump are to run in constant volume mode.

AIR COOLED CHILLER SCHEDULE

△

UNIT DESIGNATOR	CH-1		
OPERATING WEIGHT LBS.	CHILLER YARD		
IPLV.(EER)	17.35		
FULL LOAD EFFICIENCY, EER	11.74		
COEFFICIENT OF PERFORMANCE (COP)	3.44		
UNIT DESIGN INPUT, KW	51.94		
MOTOR FULL LOAD/LOCKED ROTOR AMPS (EACH COMPRESSOR, 4 IN TOTAL), AMPS	45.0/315.0		
EQUIPMENT MCA/MOP, AMPS (SINGLE POINT OF CONNECTION)	234/300		
MOTOR OPERATING SPEED R.P.M.			
STARTER TYPE/POWER CONNECTION POINTS	ACROSS THE LINE/SINGLE		
ELECTRICAL SERVICE AVAILABLE, V/Hz/Ø	230/3/60		
REFRIGERANT TYPE / CHARGE (LBS)	R-454B / 76		
COMPRESSOR/CIRCUIT QUANTITIES	4/2		
NOMINAL CAPACITY, TONS	52		
RATED CAPACITY, TONS	50.84		
WATER FLOW RATE, GPM	121.6		
ENTERING WATER TEMPERATURE, °F	54		
LEAVING WATER TEMPERATURE, °F	44		
TOTAL WATER PRESSURE DROP (INCLUDES EVAPORATOR + STRAINER), FTWG	17.6		
FOULING FACTOR	0.0001		
RATED CAPACITY, TONS	16.1		
WATER FLOW, GPM	-		
ENTERING WATER TEMPERATURE, °F	96		
LEAVING WATER TEMPERATURE, °F	113		
HEATING EFFICIENCY. COP (KW/KW)	-		
CONDENSER HEAT RECOVERY TYPE	PARTIAL W/ FAN CONTROL		
PUMP TYPE	DUAL HIGH HEAD		
AMOUNT OF PUMPS (LEAD/LAG)	2		
WATER FLOW RATE, GPM	121.6		
WATER PRESSURE DROP, FT. OF WATER	55.7		
MOTOR SIZE, HP	5 (VFD)		
WATER CONNECTION SIZE, IN.	2.5		
BUFFER TANK VOLUME, GAL	140		
EXPANSION TANK VOLUME, GAL	5		
SOUND POWER LEVEL	87dBA (COMPREHENSIVE SOUND ATTENUATION PACKAGE)		
DESIGN MANUFACTURER	TRANE		
MODEL NUMBER	CGAM052B2		

CHILLER NOTES
(*) CALCULATED BY THE FORMULA: COP = EER/3.412
* CHILLER MUST HAVE SHORT CIRCUIT RATING OF 42,000 AMPS.
* ONE CHILLED WATER PUMP TO BE ON STANDBY MODE AT ALL TIMES.
* PROVIDE CHILLER WITH THE FOLLOWING OPTIONS:
a. REFRIGERANT ISOLATION VALVES
b. INSULATION FOR HIGH HUMIDITY
c. GROOVED PIPE CONNECTIONS
d. LANCED ALUMINUM FINS WITH COMPLETE COAT
e. CIRCUIT BREAKERS
f. BACNET INTERFACE
g. PROGRAMMABLE DELAYS
h. ELASTOMATIC ISOLATORS
i. ARCHITECTURAL LOUVERED PANELS
j. PHASE REVERSAL PROTECTION
k. FIVE (5) YEARS EXTENDED WARRANTY FOR THE ENTIRE UNIT (PARTS AND LABOR).
i. PROVIDE WITH PERCENT CAPACITY CONTROL MODULE TO PREVENT CHILLER FROM ENERGIZING MORE THAN TWO (2) COMPRESSORS WHEN ANY OF THE IR HANDLING UNIT DUCT HEATERS IS ENERGIZED.
CHILLER CABINET TO BE PROVIDED WITH ANTICORROSIVE COATING BY LUVATA:
CABINET SHALL BE PROVIDED WITH SPRAY-APPLIED CORROSION-RESISTANT COATING.
COATING SHALL BE DONE AT COATING MANUFACURER'S CONTROLLED FACTORY. COATING MANUFACTURER SHALL BE LUVATA (OR APPROVED EQUAL). EXTERNAL CABINET SHALL BE LUVATA INSITU CLEAR. INSITU COATING SHALL HAVE COMPLETED 10,000 HOURS ASTM B117-07 (10 BEST, 0 WORST). CONTACT TULIA RIOS AT 954.226.9263 FO ADDITIONAL SALT SPRAY TESTING AND EVALUATED AS PER ASTM D1654-08 WITH A RATING OF 10. INFORMATION.

ELECTRIC DUCT HEATER SCHEDULE

MARK NO.	HTR SIZE KW	FRAME SIZE (WxH) in	CFM	AIR VELOCITY FPM	KW/SF	STEPS	ELECT SERV. V/Ph/hZ	MANUFACTURER/MODEL
DH-4	7.5	32X14	3000	964.2	2.57	SCR	230/1/60	WARREN TECHNOLOGY
DH-5	7.5	24X14	2250	964.2	3.21	SCR	230/1/60	WARREN TECHNOLOGY

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OWNER:

Miami Lakes Branch Library
6699 Windmill Gate Road
Miami Lakes, FL 33014

TITLE: Schedules - HVAC

REVISION
△ OWNER CHANGES 08/28/23
△ LEED COORDINATION 01/23/24
△ COORDINATION 03/26/25

DATE
04-03-2023
PROJECT NUMBER
19119
SHEET NUMBER
M5.0
OF

RELIEF AIR HOOD SCHEDULE

DESIGNATION	(N) OAI-3	(N) EAO-1	(N) EAO-2	(N) EAO-3
MANUFACTURER	LOREN COOK	LOREN COOK	LOREN COOK	LOREN COOK
WEIGHT (LBS.)	141	119	119	119
MODEL NUMBER	12X30GI	18X30GR	12X24GR	12X24GR
N.O.A. # / EXP DATE	No. 21-0405.11 / Aug. 21, 2024	No. 21-0405.11 / Aug. 21, 2024	No. 21-0405.11 / Aug. 21, 2024	No. 21-0405.11 / Aug. 21, 2024
TYPE	ROOF	ROOF	ROOF	ROOF
AHU SERVED	AHU-4 & AHU-5	AHU-1, AHU-2 & AHU-3	AHU-4	AHU-5
C.F.M.	1725	1850	1005	560 ⚠1
S.P. (INCHES OF WATER)	0.015	0.03	0.02	0.02
FACE VELOCITY (FPM)	352	528	264	175
THROAT VELOCITY (FPM)	704	528	528	440
VOLT - PH - HZ	-	-	-	-
GRAVITY BACKDRAFT DAMPER	YES	-	-	-
BAROMETRIC RELIEF DAMPER	-	YES	YES	YES
REMARKS	1, 2, 3, 5	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4
INTERLOCK	AHU-4 & AHU-5 / EMS			

REMARKS:

1. PROVIDE WITH BIRDSCREEN.
2. PROVIDE WITH INSULATED FACTORY CURB, MINIMUM 18" HIGH. INTAKE SHALL BE MINIMUM 24" ABOVE FINISHED ROOF.
3. SHALL BE ALUMINUM CONSTRUCTION.
4. SHALL BE EQUIPED WITH FACTORY FURNISHED BAROMETRIC RELIEF DAMPER. DAMPER SHALL OPEN AT 0.05 IN. W.G (ADJUSTABLE).
5. SHALL BE EQUIPED WITH FACTORY FURNISHED GRAVITY BACKDRAFT DAMPER. DAMPER SHALL OPEN AT 0.05 IN. W.G. (ADJUSTABLE).
6. SHALL BE EQUIPED WITH FACTORY FURNISHED MOTORIZED DAMPER (120 VOLT ACTUATED). CONTRACTOR TO INTERLOCK OPERATION OF DAMPER WITH EMS: DAMPER SHALL CLOSE WHEN UNIT IS TURNED OFF OR DE-ENERGIZED. DAMPER SHALL BE CLASS-1A (MAX 4CFM/FT2 LEAKAGE AT 1IN. W.G. WHEN TESTED IN ACCORDANCE WITH AMCA 500D

UV-C LAMP SCHEDULE FOR INLINE DUCT INSTALLATIONS

UNIT DESIGNATION:	UNIT SERVED	MANUFACTURER	(Qty) MODEL	CFM	DIMENSIONS W (inches)	H (inches)	D (inches)	WEIGHT (lbs)	ELECTRICAL SERVICE WATTS	AMPS	POWER
UV-1	AHU-1 (E)	AIR SNIPER	(2) Air Sniper Induct 300W	4,800	25	10	5.36	15	420	1.8	230 V/1 PH / 60Hz
UV-2	AHU-2 (E)	AIR SNIPER	(2) Air Sniper Induct 300W	4,800	25	10	5.36	15	420	1.8	230 V/1 PH / 60Hz
UV-3	AHU-3 (E)	AIR SNIPER	(2) Air Sniper Induct 300W	3,150	25	10	5.36	15	420	1.8	230 V/1 PH / 60Hz
UV-4	AHU-4 (NEW)	AIR SNIPER	(2) Air Sniper Induct 300W	3,000	25	10	5.36	15	420	1.8	230 V/1 PH / 60Hz
UV-5	AHU-5 (NEW)	AIR SNIPER	(1) Air Sniper Induct 300W	2,250	25	10	5.36	15	420	1.8	230 V/1 PH / 60Hz

NOTES:

1- On/Off Switch Power Control.
2- 5 Year Limited Warranty.
3- 6+ Year Lamp Life (55, 200 Hours).
4- BAS compatible.
5- Diferencial Pressure Switch for airflow detection.
5- Status/bulb life indicator.
6- UL 867 Ozone Certification (No Ozone).
7- Electrical Safety Certification: cETLus Certified, UL and CSA Standards
8- BAS compatible.
9- For pricing and details contact: Jorge C Menocal. Cell: +1(786)-510-6200 | e-mail:jorge@airqualityusa.com | www.airqualityusa.com

NEEDLEPOINT BIPOLAR IONIZATION

TYPE:	CORONA DISCHARGE BIPOLAR IONIZATION	CORONA DISCHARGE BIPOLAR IONIZATION
MODEL:	D6C	D6i
CFM RANGE:	2400-3600	3600-5200
IONS OUTPUT (IONS /SEC):	20 BILLION PER SECOND	50 BILLION PER SECOND
EMITTER CLEANING SYSTEM:	SELF CLEANING MAINTENANCE FREE	SELF CLEANING MAINTENANCE FREE
EMITTER POINTS:	TUNGSTEN	TUNGSTEN
INPUT VOLTAGE:	12-24 VAC/DC	12-24 VAC/DC
WEIGHT:	0.322 LB / 1.5 DUCT MOUNTED VERSION	0.322 LB / 1.5 DUCT MOUNTED VERSION
DIMENSIONS:	3.82 x 2.9 x 0.96 IN (L x W x H)	3.82 x 2.9 x 0.96 IN (L x W x H)
ACCESSORIES	DUCT MOUNT, CHASIS MOUNT	DUCT MOUNT, CHASIS MOUNT
OZONE	< 0.005 PPM	< 0.005 PPM
EQUIPMENT SERVED	AHU-3 (E), AHU-4 (NEW) & AHU-5 (NEW)	AHU-1 € & AHU-2 (E)

NOTES:

1- D6 Series is a BacNet compatible unit with self-cleaning and self-maintaining needle system incorporated.
2- Neutralized: Viruses, Bacteria, Mold Spores, Fungi and smoke.
3- Certifications: UL 867, UL 2998, CE.
4- Operating environment: Temp. (14°F) – (158°F), Hum. 20-80% non-condensing
5- EMI Below background levels (rec. 3.464 inches distance)
6- For pricing and details contact: Jorge C Menocal. Cell: +1(786)-510-6200 | e-mail:jorge@airqualityusa.com | www.airqualityusa.com

AIR COOLED SPLIT A/C UNIT SCHEDULE

DESIGNATION		AC-1 / CU-1
LOCATION		IT ROOM
MANUFACTURER		TRANE-MITSUBISHI
MODEL NUMBER		PKA-AL12NL / PUY-AK12NL
CAPACITY - COOLING BTU/H		10,544
POWER CONSUMPTION - COOLING W		--
SEER2		21.3
COP		-
ELECTRICAL SERVICE AVAILABLE		230 / 1 / 60
MOCP		27
MCA		16
FAN MOTOR (F.L.A.)		/
CONMPRESSOR R.L.A. / L.R.A.		--- / ---
AIRFLOW HIGH (CFM) - COOL		425
MOISTURE (Gal / H)		0.28
SOUND LEVEL LOW-MED-HIGH / DB (A)		-
COND. DRAIN CONN. O.D. (IN)		--- / ---
DIMENSIONS IDU / ODU	W (IN)	36 / 34
	D (IN)	10 / 12
	H (IN)	12 / 24
REFRIGERANT / lbs		R-454B / 4.95
WEIGHT (LB.)		29 / 92

NOTES:

1. A/C SYSTEM SHALL BE UNDER 24/7 OPERATION.
2. PROVIDE WITH WIRE THERMOSTAT TAR-40MAAU
3. UNIT MOUNTED DISCONNECT.
4. FACTORY CONTROLS
5. FACTORY MOUNTING KIT
6. ANTI-CORROSION COATING ON COILS AND FINS: SHALL MEET A MIN. OF 5,000 HOURS UNDER ASTM B117 SALT SPRAY TEST.LUVATA INSITU. COATING THICKNESS NOT TO EXCEED 15 MICRONS.
7. PROVIDE DRAIN PAN LEVEL SENSOR/CONTROL SS610E
8. PROVIDE HAIL GUARD ON CONDENSING UNIT COILS.
9. PROVIDE DRAIN PAN LEVEL SENSOR (SS610E) TO ALL WALL MOUNTED UNITS.
10. INDOOR UNIT SHALL BE EQUIPPED WITH A REFRIGERANT LEAK DETECTION SYSTEM, WITH / LEAK SENSOR AND CONTROL LOGIC ELECTRONICS THAT ACTIVATE THE EVAPORATOR.
11. PROVIDE HAIL GUARD ON CONDENSING UNIT COILS.

VENTILATION FAN SCHEDULE

FAN NO.		(N) EF-1	(N) EF-2 & 3	(N) SF-1	(N) SF-2	(N) SF-3	(N) SF-4	(N) SF-5
AREA SERVED		JAN	BATHS	AHU-1 O/A	AHU-2 O/A	AHU-3 O/A	AHU-4 O/A	AHU-5 O/A
OPERATING WEIGHT LBS. (APPROX.)		13	31	48	48	48	48	48
LOCATION		CEILING	CEILING	CEILING	CEILING	CEILING	CEILING	CEILING
MANUFACTURER & MODEL NO.		COOK GC-128	COOK GC-622	COOK 100SQN-B	COOK 100SQN-B	COOK 100SQN-B	COOK 100SQN-B	COOK 100SQN-B ⚠1
TOTAL AIR CFM		70	210	1105	775	630	1085	640
FAN	SONES	0.6	1.5	11.4	11.4	11.4	11.4	11.4
	DRIVE TYPE	DIRECT	DIRECT	BELT	BELT	BELT	BELT	BELT
	WHEEL TYPE	CENTRIF.	CENTRIF.	CENTRIF.	CENTRIF.	CENTRIF.	CENTRIF.	CENTRIF.
	SPEED (RPM)	666	1077	2179	1520	1280	2179	1280
	TOT. STATIC PRESS. (IN. WATER)	0.1	0.25	0.5	0.5	0.5	0.5	0.5
	MOTOR HP (NON-OVERLOAD)	26 WATTS	97 WATTS	1/2	1/2	1/2	1/2	1/2
	STARTER TYPE/FURNISHED BY	-	-	-	-	-	-	-
	ELECTRICAL SERVICE	120V/60Hz/1PH	120V/60Hz/1PH	120V/60Hz/3PH	120V/60Hz/3PH	120V/60Hz/3PH	120V/60Hz/3PH	120V/60Hz/3PH
ACCESSORIES	SERVICE SWITCH	YES	YES	YES	YES	YES	YES	YES
	CONSTRUCTION	PLASTIC ALUMINUM	STEEL ALUMINUM	STEEL ALUMINUM	STEEL ALUMINUM	STEEL ALUMINUM	STEEL ALUMINUM	STEEL ALUMINUM
	BACKDRAFT DAMPER	YES	YES	YES	YES	YES	YES	YES
	OA MOTORIZED DAMPER	NO	NO	YES	YES	YES	YES	YES
	BIRDSCREEN	NO	NO	NO	NO	NO	NO	NO
	ROOF CURB	NO	NO	NO	NO	NO	NO	NO
	VFD	NO	NO	YES	YES	YES	YES	YES
	INTERLOCK WITH	LIGHT SWITCH	LIGHT SWITCH	AHU-1	AHU-2	AHU-3	AHU-4	AHU-5
REMARKS		(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)	(1)(2)(3)

FAN NOTES:

1. PROVIDE SOLID STATE SPEED CONTROL.
2. PROVIDE VIBRATION ISOLATION 1" STATIC DEFLECTION MASON INDUSTRIES MANUFACTURER OR EQUAL.
3. ALTERNATE MANUFACTURERS OF EQUAL QUALITY MAY BE SUBMITTED FOR APPROVAL.

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TITLE: Schedules - HVAC

REVISION

⚠1	LEED COORDINATION	01/23/24
⚠1	COORDINATION	03/26/25

DATE
04-03-2023

PROJECT NUMBER
19119

SHEET NUMBER
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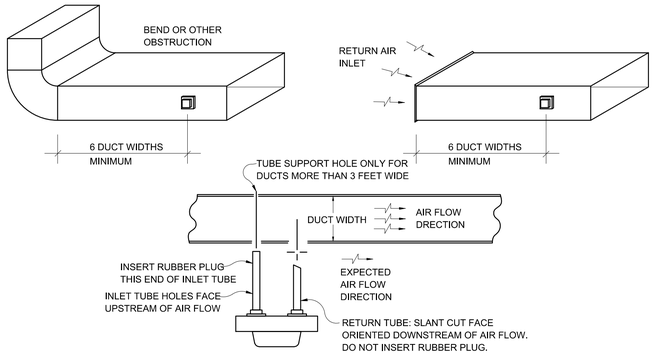
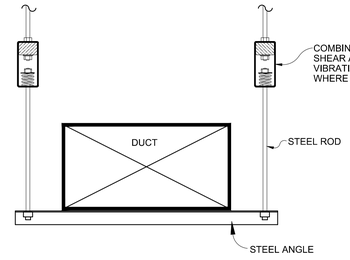
OF



TYPICAL DUCT DETECTOR INSTALLATION
Scale: N.T.S.



TRAPEZE HANGERS
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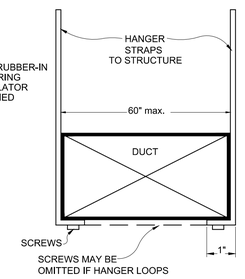

STRAP HANGERS
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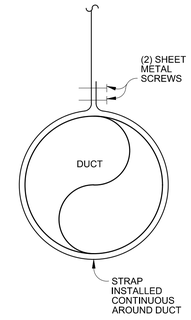
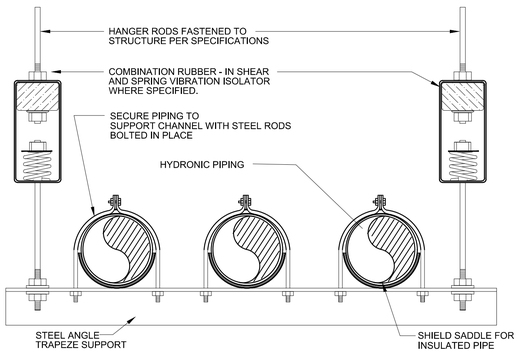
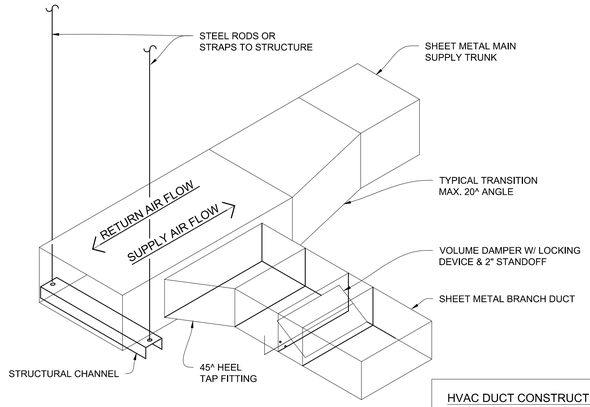


NOTE:
REFER TO (SMACNA) TABLES FOR STRAPS MINIMUM GAGES



HYDRONIC PIPE SUPPORT DETAIL
NTS

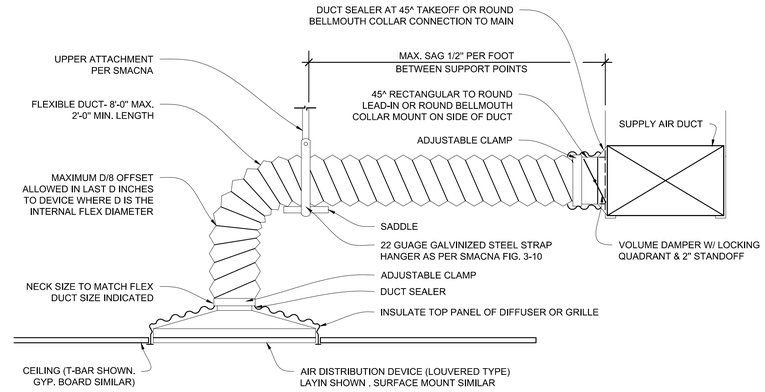


BRANCH DUCT TAKEOFF DETAIL
Scale: N.T.S.

HVAC DUCT CONSTRUCTION STANDARDS

ALL DUCTWORK MUST COMPLY WITH SMACNA HVAC CONSTRUCTION STANDARD AS FOLLOWS:

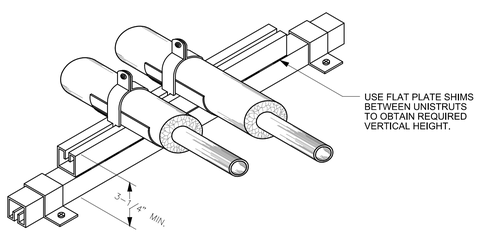
MEDIUM PRESSURE DUCTWORK:	3"w.g.
LOW-PRESSURE DUCTWORK:	2"w.g.
DUCTWORK DOWNSTREAM OF VAV BOXES: -	2"w.g.



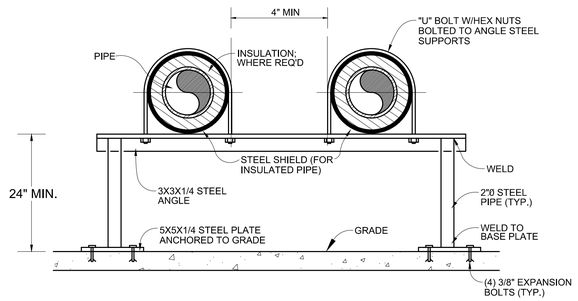
NOTES

1. FLEXIBLE DUCTS SHALL BE ONE PIECE AND SHALL NOT BE SPLICED TOGETHER .
2. EXTEND FLEXIBLE DUCT INSULATION TO DUCT/DIFFUSER PANEL INSULATION AND SEAL WITH MASTIC .
3. FLEXIBLE AIR DUCT SHALL NOT EXCEED 8 FT. WHEN EXTENDED . ELBOW RADIUS SIZED FOR NO LESS THAN R / D = 1.0 .
4. 24 INCH ORANGE SURVEY TAPE SHALL BE PROVIDED ON ALL DUCT QUADRANT LOCKING LEVERS.

FLEXIBLE DUCT TAKEOFF DETAIL
Scale: N.T.S.



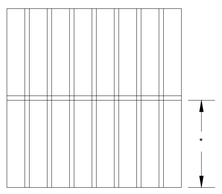
PIPE SUPPORT ARRANGEMENT DETAIL
N.T.S.



NOTE :

1. ALL OUTDOOR STEEL SUPPORT COMPONENTS FOR PIPES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.

OUTDOOR FLOOR PIPE SUPPORT DETAIL
N.T.S.



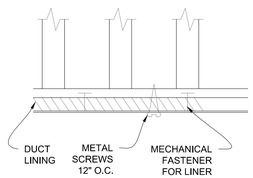
* MAXIMUM UNSUPPORTED VANE LENGTH

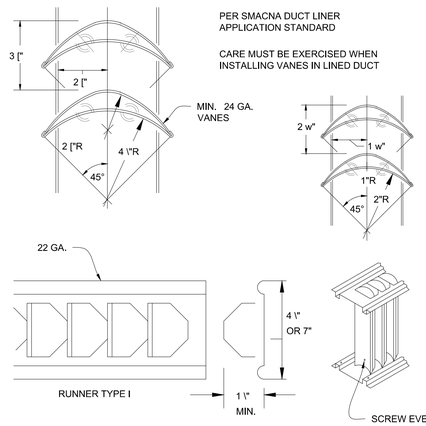
SMALL DOUBLE VANE	60"
LARGE DOUBLE VANE	72"

INSTALL VANES IN SECTIONS OR USE TIE RODS TO LIMIT THE UNBACKED VANE LENGTH.

VANES SHALL BE SECURELY FASTENED TO RUNNERS.

ALL VANES SHALL BE SECURE AND STABLE IN INSTALLED OPERATING POSITION.





PER SMACNA DUCT LINER APPLICATION STANDARD

CARE MUST BE EXERCISED WHEN INSTALLING VANES IN LINED DUCT

TURNING VANES
Scale: N.T.S.

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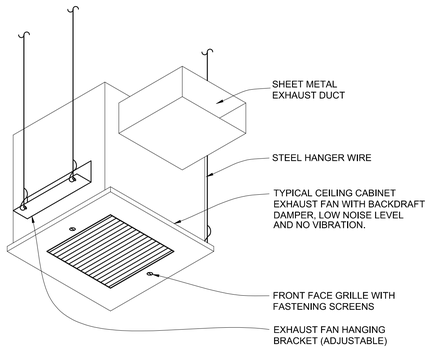
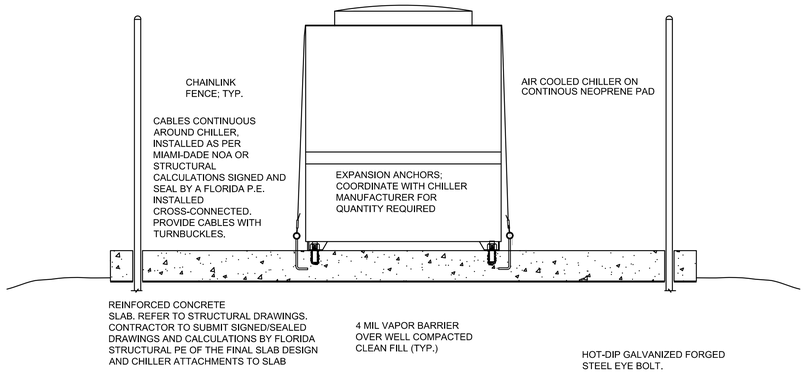


CEILING MOUNTED CABINET EXHAUST FAN DETAIL

N.T.S.

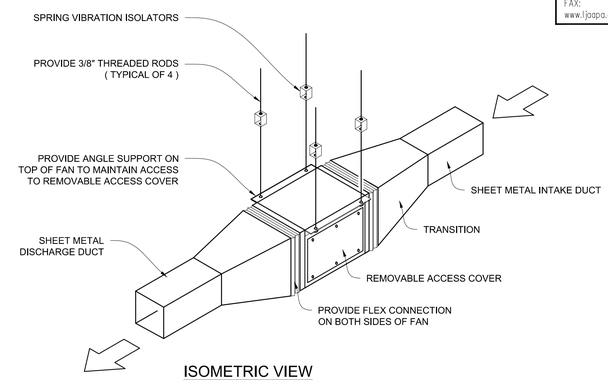


NOTES:

1. INSTALLATION MUST MEET MINIMUM WIND LOADING REQUIREMENTS OF THE 2020 FBC. CONTRACTOR SHALL SUBMIT MIAMI-DADE NOA OR SHOP DRAWINGS PREPARED AND SIGNED/SEALED BY A FLORIDA STRUCTURAL PE FOR APPROVAL PRIOR TO INSTALLATION.

AIR COOLED CHILLER MOUNTING DETAIL AT CHAINLINK ENCLOSURE

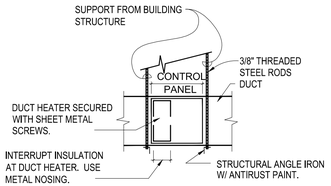
N.T.S.



ISOMETRIC VIEW

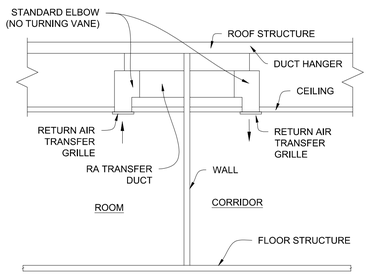
INLINE FAN MOUNTING DETAIL

NTS



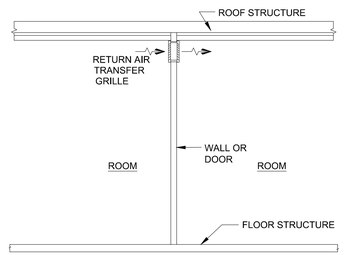
DUCT HEATER MOUNTING DETAIL

N.T.S.



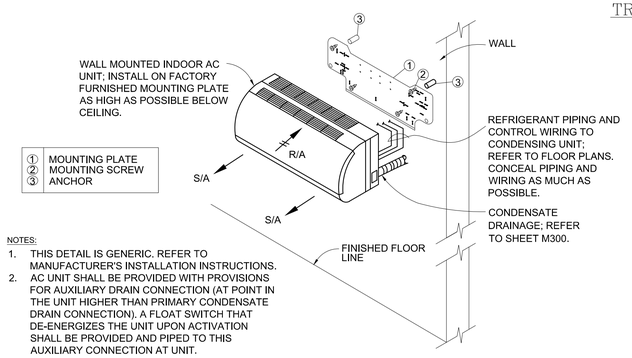
TRANSFER AIR DUCT DETAIL

N.T.S.



TRANSFER AIR DUCT DETAIL

N.T.S.



NOTES:

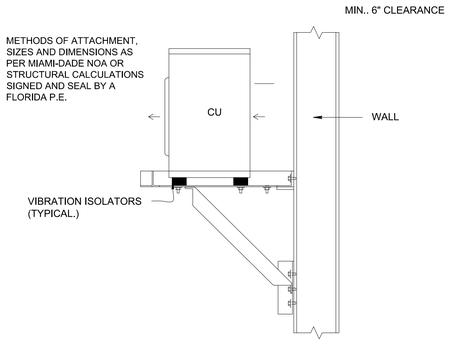
1. THIS DETAIL IS GENERIC. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. AC UNIT SHALL BE PROVIDED WITH PROVISIONS FOR AUXILIARY DRAIN CONNECTION (AT POINT IN THE UNIT HIGHER THAN PRIMARY CONDENSATE DRAIN CONNECTION). A FLOAT SWITCH THAT DE-ENERGIZES THE UNIT UPON ACTIVATION SHALL BE PROVIDED AND PIPED TO THIS AUXILIARY CONNECTION AT UNIT.

EQUIPMENT SPECIFICATIONS:

REFRIGERANT PIPING: DRAWN TEMPER COPPER TUBE, ASTM B-88, TYPE L, WITH WROUGHT COPPER SOLDER JOINT FITTINGS. SOLDER SHALL BE APPLIED WITH SUITABLE FLUX. INSULATION FOR PIPING SHALL BE 3/4" PREMOLDED, UNSLIT ARMAFLEX WITH VAPOR RETARDER; APPLY MANUFACTURER'S ADHESIVE AND WOVEN FIBER TAPE AT ALL INSULATION JOINTS. IF "CONVENTIONAL" DX SYSTEM, INSULATE ONLY THE SUCTION PIPING. IF VARIABLE REFRIGERANT FLOW (VRF) SYSTEM, INSULATE BOTH THE SUCTION AND LIQUID PIPING.

WALL MOUNTED AC UNIT INSTALLATION DETAIL

N.T.S.

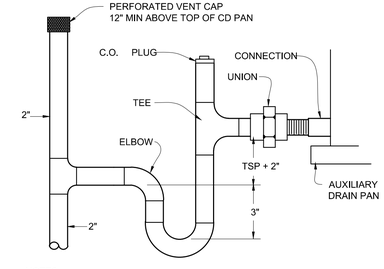


NOTES:

1. INSTALLATION MUST MEET MINIMUM WIND LOADING REQUIREMENTS OF THE 2020 FBC. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS PREPARED AND SIGNED/SEALED BY A FLORIDA STRUCTURAL PE OR MIAMI-DADE NOA FOR APPROVAL PRIOR TO INSTALLATION.

REMOTE REFRIGERATION
CONDENSING UNIT MOUNTING DETAIL

N.T.S.



NOTES:

A. SLOPE DRAIN LINE TO CONDENSATE RECEPTOR (MIN. 1/8" PER FOOT)
B. DRAIN LINE SHALL BE COPPER TYPE "L" AND INSULATED
C. TSP = FAN TOTAL STATIC PRESSURE
D. PROVIDE CONDENSATE OVERFLOW SAFETY SWITCH TO TURN OFF THE UNIT IF DRAIN PAN APPROACHES OVERFLOW.

A/C CONDENSATE P-TRAP DETAIL

N.T.S.

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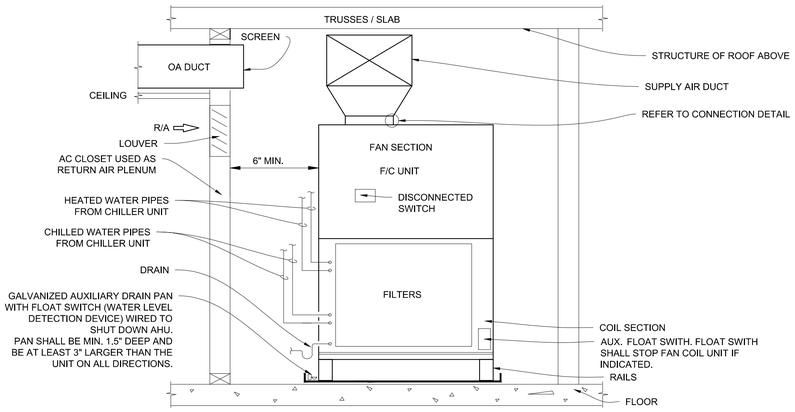
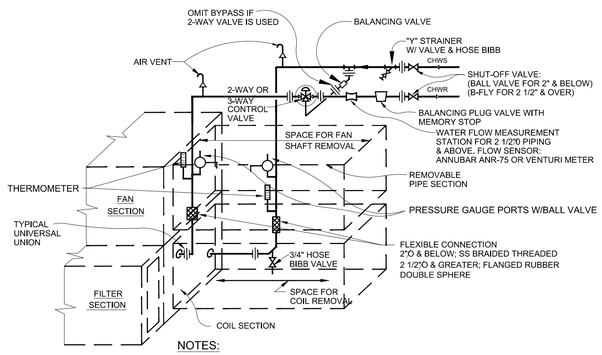


INDOOR A/C UNIT MOUNTING DETAIL WITH RETURN AIR THROUGH DUCTED OR SIDE WALL GRILLE

N.T.S.

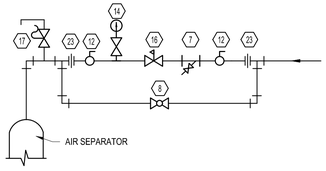


NOTES:

1. THREADED FITTINGS AND UNIONS FOR PIPES 2" SIZE AND SMALLER.
2. FOR SIZES 2 1/2" AND LARGER, UNIONS, VALVES AND ACCESSORIES SHALL BE FLANGED. FITTINGS SHALL BE WELDED TYPE.
3. CONTRACTOR SHALL INSTALL ALL REQUIRED PIPING WITHOUT IMPAIRING SPACES FOR FAN SHAFT, COIL AND FILTER REMOVAL.
4. MAXIMUM P.D. OF 5 PSI IN CONTROL VALVE

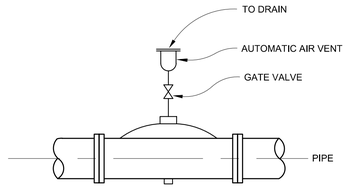
A.H.U. COOLING & HEATING / REHEATING COIL CONNECTIONS (TYPICAL)

N.T.S.



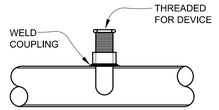
MAKE-UP WATER STATION

N.T.S.



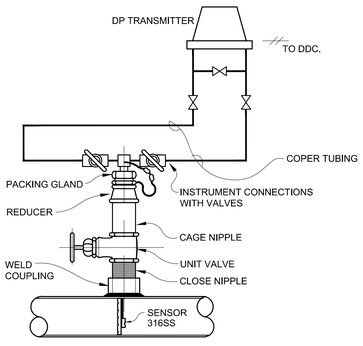
AIR PURGER DETAIL

N.T.S.



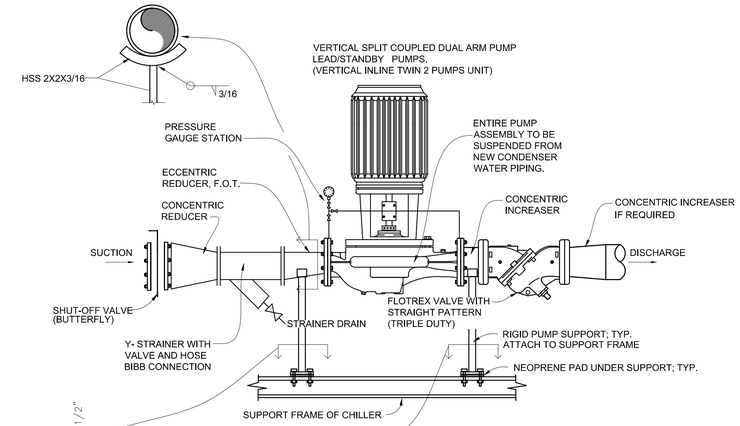
TYPICAL INSTRUMENT OR DATA WELL

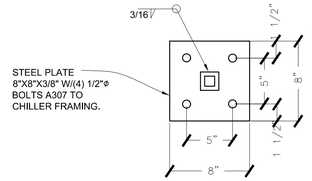
N.T.S.



FLOWMETER DETAIL

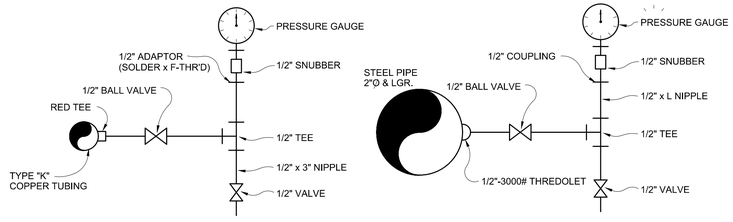
N.T.S.





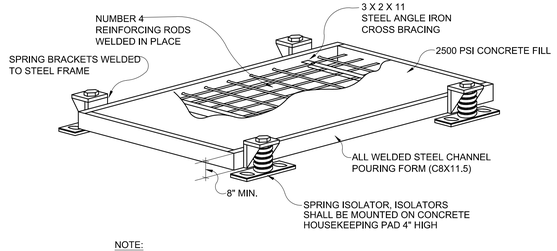
VERTICAL INLINE PUMP INSTALLATION DETAIL

N.T.S.



CHILLED WATER PRESS. GAUGE ASSY.

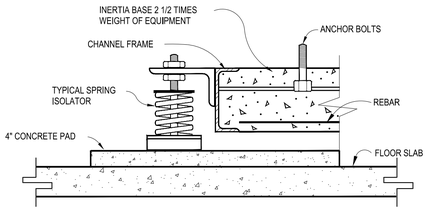
N.T.S.



NOTE:
INERTIA BASE SHALL BE DESIGNED FOR 2.5 TIMES PUMP OPERATING WEIGHT.

DETAIL OF INERTIA BASE

N.T.S.



INERTIA BASE MOUNTING DETAIL

N.T.S.

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State of Florida: License No. 64759
EDUARDO ALBERTO SUAREZ LICENSE No. 64759 STATE OF FLORIDA PROFESSIONAL ENGINEER

OWNER:

Miami Lakes Branch Library
6699 Windmill Gate Road
Miami Lakes, FL 33014

TITLE: Details - HVAC

REVISION

DATE
04-03-2023

PROJECT NUMBER
19119

SHEET NUMBER
M7.2

OF

PROJ. No. 30056 CA 924
LOUIS J. AGUIRRE & ASSOCIATES P.A.
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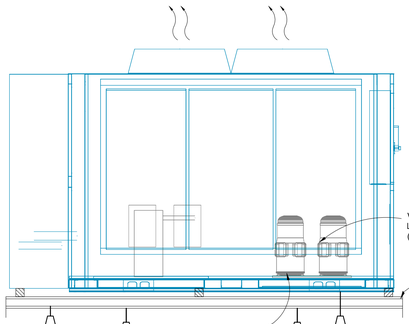

CH-1

VERTICAL SPLIT COUPLED DUAL ARM PUMP
LEAD/STANDBY PUMP.
(VERTICAL INLINE TWIN 2 PUMPS UNIT)

CHILLER SUPPORT STRUCTURE

SECURE DUAL ARM PUMP RIGIDLY TO CHILLER FRAME.

TO MAKE-UP WATER STATION

DIAPHRAGM-TYPE EXPANSION TANK (EXISTING)

1"Ø DRAIN. SEE PLUMBING DWGS.

HOT WATER PUMP

HWS

CHWS

HWR

CHWR

FLOW CONTROL (TYP.)

EMERGENCY CHILLER CONNECTION

AUTOMATIC AIR VENT

AIR SEPARATOR

1"Ø DRAIN. (SEE PLUMBING DWGS.)

1/2"Ø

FLOW CONTROL (TYP.)

TO AND FROM AHU COILS

CHEMICAL POT FEEDER SYSTEM FOR CHILLED WATER

TO DRAIN. SEE PLUMBING DWG.

TO MAKE-UP WATER STATION

DIAPHRAGM-TYPE EXPANSION TANK

1"Ø DRAIN. SEE PLUMBING DWGS.

AUTOMATIC AIR VENT

1/2"Ø

AIR SEPARATOR

1"Ø DRAIN. (SEE PLUMBING DWGS.)

CHWR

CHWS

TO AND FROM AHU COILS

CHEMICAL POT FEEDER SYSTEM FOR CHILLED WATER

TO DRAIN. SEE PLUMBING DWG.

PIPING LEGEND

1	FLANGE	9	3/4" HOSE BIBB CONNECTION	17	PRESSURE RELIEF VALVE	24 FS	FLOW SWITCH
2	CONCENTRIC REDUCER	10	AIR VENT	18	ECCENTRIC REDUCER	25 TT	TEMPERATURE TRANSMITTER
3	BUTTERFLY VALVE, LUG TYPE	11	PRESSURE-TEMPERATURE TEST PORT	19	SOLENOID VALVE	CHWS	CHILLED WATER SUPPLY
4	M BUTTERFLY VALVE, LUG TYPE WITH MEMORY STOP	12	BALL VALVE	20	GATE VALVE	CHWR	CHILLED WATER RETURN
5	DOUBLE SPHERE FLEXIBLE CONNECTOR	13	CIRCUIT SETTER	21	FLOW METER STATION (VENTURI METER OR ANNUBAS, ANR-75 FLOW SENSOR)	HWS	CHILLED WATER SUPPLY
6	SILENT CHECK VALVE	14	PET COCK AND 4" DIAL PRESSURE GAGE	22	PLUG BALANCING VALVE	HWR	CHILLED WATER RETURN
7	Y-STRAINER WITH VALVE AND HOSE BIBB CONNECTION	15	9" ADJUSTABLE MERCURY THERMOMETER WITH WELL	23	UNION		
8	GLOBE valve	16	PRESSURE REDUCING VALVE				

HEATED AND CHILLED WATER FLOW SCHEMATIC DIAGRAM AT CHILLER STATION

N.T.S.

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REVISION
OWNER CHANGES 08/28/23

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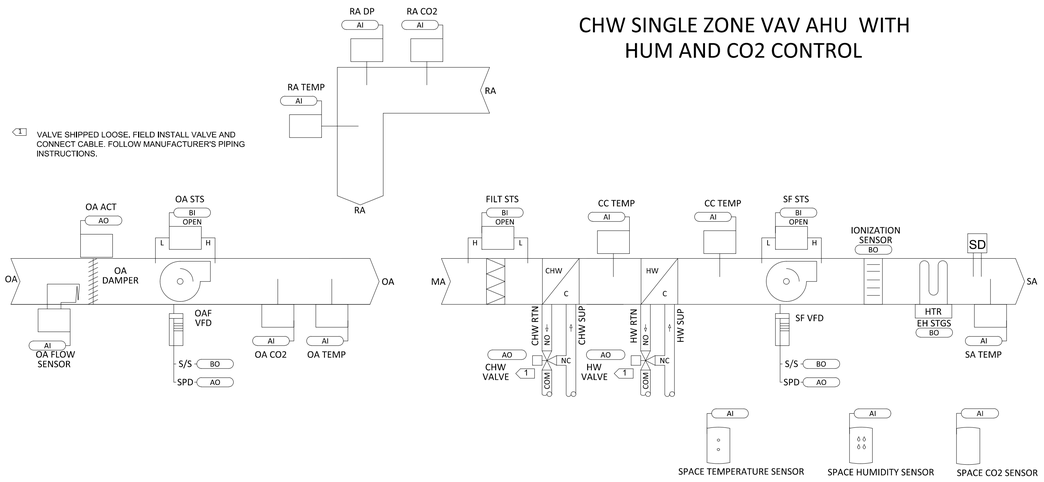
CHW SINGLE ZONE VAV AHU WITH HUM AND CO2 CONTROL



SINGLE ZONE VAV AHU WITH HUM AND CO2 CONTROL POINT LIST															
	POINT TYPE						ALARMS								
SYSTEM POINT DESCRIPTION	GRAPHIC	HARDWARE INPUT	HARDWARE OUTPUT	SOFTWARE POINT	HARDWARE INTERLOCK	DEFAULT VALUE	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL	DIAGNOSTICS	NOTES:
SA SD LOCAL CLOSE				X										
SPACE AIR TEMP	X	AI					X	X			X		SENSOR FAILURE	NOTE 1
SPACE AIR CO2	X	AI					X							NOTE 1
SA TEMP	X	AI					X	X			X		SENSOR FAILURE	
CC LEAVING TEMP	X	AI					X	X			X		SENSOR FAILURE	
SPACE AIR HUM	X	AI					X							NOTE 1
OA FLOW SENSOR	X	AI						X						
FILTER STSTUS	X	BI								X			FILTER DIRTY	
SF STATUS	X	BI								X			FAN FAILURE	
OA/RA TEMP	X	AI					X	X			X		SENSOR FAILURE	
OA/RA CO2	X	AI					X	X			X		SENSOR FAILURE	
RA DEW POINT	X	AI					X	X			X		SENSOR FAILURE	
OA DAMPER	X		AO											
CHW/HW VALVES	X		AO											
HEATING STAGES	X		BO											NOTE 3
SF START/STOP	X		BO											
IONIZATION MODULE	X		BO											
SF VFD SPEED	X		AO											
OCCUPIED COOLING SP				X		74°F								
OCCUPIED HEATING SP				X		70°F								
BAS COMM STATE	X			X								X		NOTE 2
GENERAL NOTES	1- SEE PLANS FOR LOCATION													
	2- DISPLAY AT BAS USER INTERFACE													
	3- SEE EQUIPMENT SCHEDULE FOR NUMBER OF HEATING STAGES													

SINGLE ZONE AHU WITH HUMIDITY AND CO2 CONTROL SEQUENCE OF OPERATIONS:
BUILDING AUTOMATION SYSTEM INTERFACE: THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER OCCUPIED/UNOCCUPIED MODES. IF COMMUNICATION IS LOST WITH THE BAS THE CONTROLLER SHALL OPERATE USING DEFAULT MODES AND SETPOINTS.

OCCUPIED MODE: DURING OCCUPIED PERIODS, THE SUPPLY FAN SHALL RUN CONTINUOUSLY AND THE OUTSIDE AIR DAMPER SHALL OPEN TO MAINTAIN MINIMUM VENTILATION REQUIREMENTS.

- COOLING MODE:THE CHILLED WATER VALVE SHALL MODULATE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT (55°F). IF THE DISCHARGE AIR TEMPERATURE SENSOR FAILS, AN ALARM SHALL BE ANNUNCIATED AT THE BAS.
- HEATING MODE: WHEN THE SUPPLY FAN VFD SPEED IS AT ITS MINIMUM SPEED REQUIRED AND SPACE AIR TEMPERATURE IS LOWER THAN ITS HEATING SETPOINT, THE CONTROLLER SHALL CLOSE THE CHILLED WATER VALVE AND STAGE THE HEATER TO MAINTAIN THE SPACE AIR TEMPERATURE SETPOINT. IF THE SPACE AIR TEMPERATURE SENSOR FAILS, THE ELECTRIC HEATER SHALL BE DISABLED AND AN ALARM SHALL BE ANNUNCIATED AT THE BAS.

UNOCCUPIED MODE: SUPPLY FAN SHALL BE OFF. OA DAMPER, CHW VALVE , AND HW VALVE SHALL CLOSE.

SPACE AIR TEMPERATURE: DURING COOLING MODE, THE CONTROLLER SHALL MODULATE SF VFD SPEED TO MAINTAIN THE ACTIVE SPACE AIR TEMPERATURE COOLING SETPOINT. DURING HEATING MODE, THE CONTROLLER SHALL STAGE THE HEATER TO MAINTAIN THE SPACE AIR TEMPERATURE HEATING SETPOINT.

SPACE AIR HUMIDITY: THE SYSTEM SHALL MEASURE THE SPACE AIR HUMIDITY, AND USE IT AS REQUIRED FOR HUMIDITY CONTROL.IF HIGH HUMIDITY IS DETECTED DURING UNOCCUPIED MODE, THE SYSTEM SHALL PLACE THE UNIT IN OCCUPIED MODE AND IMPLEMENT THE DEHUMIDIFICATION SEQUENCE.

HUMIDITY CONTROL: IF THE SPACE AIR RELATIVE HUMIDITY IS GREATER THAN 50% (ADJ.), THE COOLING COIL LEAVING AIR TEMPERATURE SETPOINT SHALL BE RESET 2°F (ADJ.) LOWER AND MODULATE THE HW VALVE TO MAINTAIN THE SPACE AIR TEMPERATURE SETPOINT. MODE SHALL TERMINATE WHEN THE SPACE AIR RELATIVE HUMIDITY FALLS BELOW THE RELATIVE HUMIDITY SETPOINT OF 50% (ADJ.) MINUS 3% (ADJ.). IF THE SPACE AIR RELATIVE HUMIDITY SENSOR FAILS THE DEHUMIDIFICATION SEQUENCE SHALL BE TERMINATED AND AN ALARM SHALL BE ANNUNCIATED AT THE BAS.

SUPPLY FAN STATUS: IF THE SUPPLY FAILS TO PROVE STATUS FOR 30 SECONDS (ADJ.), THE FAN SHALL BE COMMANDED OFF, THE OUTSIDE AIR DAMPER SHALL CLOSE, DX COOLING AND HEATER SHALL SHALL BE DISABLED AND AN ALARM SHALL BE ANNUNCIATED AT THE BAS. A MANUAL RESET SHALL BE REQUIRED TO RESTART THE FAN.

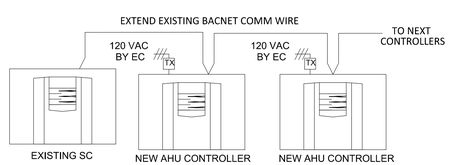
FILTER STATUS: A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER WHEN THE FAN IS RUNNING. IF THE SWITCH CLOSES DURING NORMAL OPERATION A DIRTY FILTER ALARM SHALL BE ANNUNCIATED AT THE BAS.

MINIMUM REQUIRED VENTILATION: WHEN IN THE OCCUPIED MODE, THE CONTROLLER SHALL MONITOR THE FLOW-MEASURING OUTDOOR-AIR MODULATE THE OA DAMPER TO MAINTAIN THE CURRENT OUTDOOR AIRFLOW AT SETPOINT. IF OA DAMPER IS FULLY OPEN, AND MINIMUM VENTILATION REQUIREMENTS ARE NOT MET, THE CONTROLLER SHALL MODULATE THE RA DAMPER TOWARDS CLOSE POSITION TO MAINTAIN OA FLOW SETPOINT. THE BAS SHALL RESET THIS OUTDOOR AIRFLOW SETPOINT BASED ON THE CURRENT VENTILATION NEEDS OF THE SPACE (CO2 CONCENTRATION). AN ALARM SHALL BE ANNUNCIATED AT THE BAS WHEN THE OA FLOW IS 10% LESS THAN MINIMUM OA REQUIRED SETPOINT.

CO2 CONTROL:THE CONTROLLER SHALL MONITOR THE SPACE AIR CO2 CONCENTRATION LEVEL (SEE PLANS FOR CO2 SENSORS LOCATION AND QUANTITIES) AND USE IT AS REQUIRED FOR IAQ CONTROL. AN ALARM SHALL BE SENT TO THE BAS WHEN THE SPACE AIR CO2 CONCENTRATION LEVEL IS HIGHER THAN SETPOINT (750 PPM (ADJ.))

SMOKE DETECTOR SHUTDOWN (BY FIRE ALARM CONTRACTOR): THE UNIT SHALL SHUT DOWN IN RESPONSE TO A SIGNAL FROM THE SMOKE DETECTOR INDICATING THE PRESENCE OF SMOKE. THE SMOKE DETECTOR SHALL BE INTERLOCKED TO THE UNIT THROUGH THE DRY CONTACTS OF THE SMOKE DETECTOR. A MANUAL RESET OF THE SMOKE DETECTOR SHALL BE REQUIRED TO RESTART THE UNIT.

EXISTING NETWORK



GENERAL NOTES:
-NEW AHU CONTROLLERS SHALL BE AN EXPANSION OF EXISTING TRANE BAS. NO EXCEPTIONS ALLOWED.
-SPACE SENSORS LOCATED AS PER PLANS.
-BAS CONTRACTOR SHALL DISCONNECT EXISTING CHILLER AND CONNECT NEW CHILLER TO EXISTING BAS. CHILLER PLANT SEQUENCE OF OPERATIONS IS EXISTING TO REMAIN.
-DIV.16 ELECTRICAL CONTRACTOR TO PROVIDE 120/277 VAC POWER TO ALL FIELD CONTROLLERS
-MOTORIZED DAMPERS BY OTHERS. CONTROL DAMPER ACTUATORS BY CONTROL CONTRACTOR

BASIS OF DESIGN TRANE (954) 499-6900

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TITLE: CONTROLS DIAGRAMS - HVAC

REVISION

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PROJECT NUMBER
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M7.4

OF

PROJ. No. 30056 CA 924
LOUIS J. AGUIRRE & ASSOCIATES P.A.
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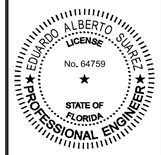

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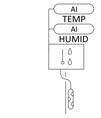
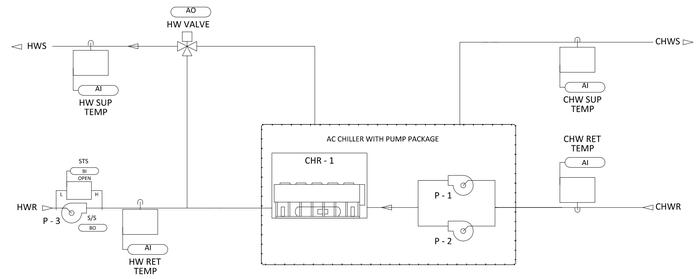
TITLE: CONTROLS DIAGRAMS - HVAC

OUTDOOR TEMP/HUMIDITY SENSOR



CHILLER PLANT



	CHILLER PLANT SYSTEM POINT LIST															
	POINT TYPE						ALARMS									
SYSTEM POINT DESCRIPTION	GRAPHIC	HARDWARE INPUT	HARDWARE OUTPUT	SOFTWARE POINT	HARDWARE INTERLOCK	DEFAULT VALUE	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL	DIAGNOSTICS	NOTES:
CHWR/HWR TEMP	X	AI					X	X						NOTE 4
CHWS/HWS TEMP	X	AI					X	X						NOTE 4
OA TEMP/HUM	X	AI									X		SENSOR FAILURE	NOTE 3,4
HW VALVE	X	AO									X		VALVE FAILURE	
HW PUMP STATUS	X	BI							X	X			PUMP FAILURE	NOTE 1
HW PUMP S/S	X		BO				X	X						NOTE 1
CHILLER PLANT ENABLE				X										
CHWS SETPOINT				X		44°F								
OA ENABLE SETPOINT				X		60°F								
BAS COMM STATE	X			X								X		NOTE 2
GENERAL NOTES	1- TYPICAL OF 2													
	2- DISPLAY AT BAS USER INTERFACE													
	3- SEE PLANS FOR LOCATION													
	4- CAN BE A COMMUNICATED VALUE													

CHILLER PLANT SEQUENCE OF OPERATIONS
SYSTEM GENERAL DESCRIPTION: THE CHILLED WATER SYSTEM CONSISTS OF THE FOLLOWING:
ONE (1) CHILLER AND TWO INTERNAL (2) CHILLED WATER PUMPS: ONE (1) PRIMARY AND ONE (1) STANDBY
ONE (1) HOT WATER PUMP

CHILLER - RUN CONDITIONS: THE PRIMARY CHILLER SHALL BE ENABLED TO RUN WHENEVER:
- A DEFINABLE NUMBER OF CHILLED WATER COILS NEED COOLING
- AND THE OUTSIDE AIR TEMPERATURE IS GREATER THAN 54°F (ADJ.).

WHEN ENABLED, THE CHILLER, VIA ITS INTERNAL CONTROLS, SHALL MAINTAIN THE CHILLED WATER SUPPLY TEMPERATURE AT SETPOINT.

CHILLED WATER PUMP PRIMARY/STANDBY (BY CHILLER CONTROLLER): THE CHILLED WATER PUMP PRIMARY/STANDBY SEQUENCE SHALL BE ROTATED ON A WEEKLY SCHEDULE. THE SEQUENCE SHALL BE BASED ON CALCULATED RUN TIME WITH THE PUMP HAVING THE LEAST RUN TIME AS PRIMARY PUMP AND THE PUMP WITH THE HIGHEST RUN TIME WILL BE THE STANDBY PUMP.

CHILLER PLANT CONTROLLER SHALL COMMAND HW PUMP FOR A MINIMUM OF 15 SEC (ADJ.) AFTER ANY 3-WAY RE-HEAT WATER COIL VALVE OF ANY AHU OPENS AND 15 SEC (ADJ.) BEFORE CHILLER ENERGIZES (IF CHILLER IS OFF AT THE TIME HOT WATER REHEAT IS REQUIRED)

HOT WATER VALVE SHALL MODULATE TO MAINTAIN THE MINIMUM HEAT EXCHANGER LEAVING TEMPERATURE SETPOINT (115 DEG f (ADJ.)). WHILE THE HE WATER LEAVING TEMPERATURE IS ABOVE SETPOINT, WATER SHALL FLOW DIRECTLY THROUGH THE HE WITHOUT GOING THROUGH THE BYPASS VALVE. AS THE HE WATER LEAVING TEMPERATURE DROPS CLOSER TO THE HE WATER LEAVING TEMPERATURE SP, THE BYPASS VALVE WILL SLOWLY MODULATE SO THAT LESS WATER FLOWS THROUGH THE HE. THE BYPASS VALVE MUST ALWAYS ALLOW A MINIMUM TRICKLE FLOW TO BE PRESENT THROUGH THE HE WHILE THE HW PUMP IS RUNNING SO THAT THE LEAVING HOT WATER TEMPERATURE GETS AN ACCURATE READING.

REVISION

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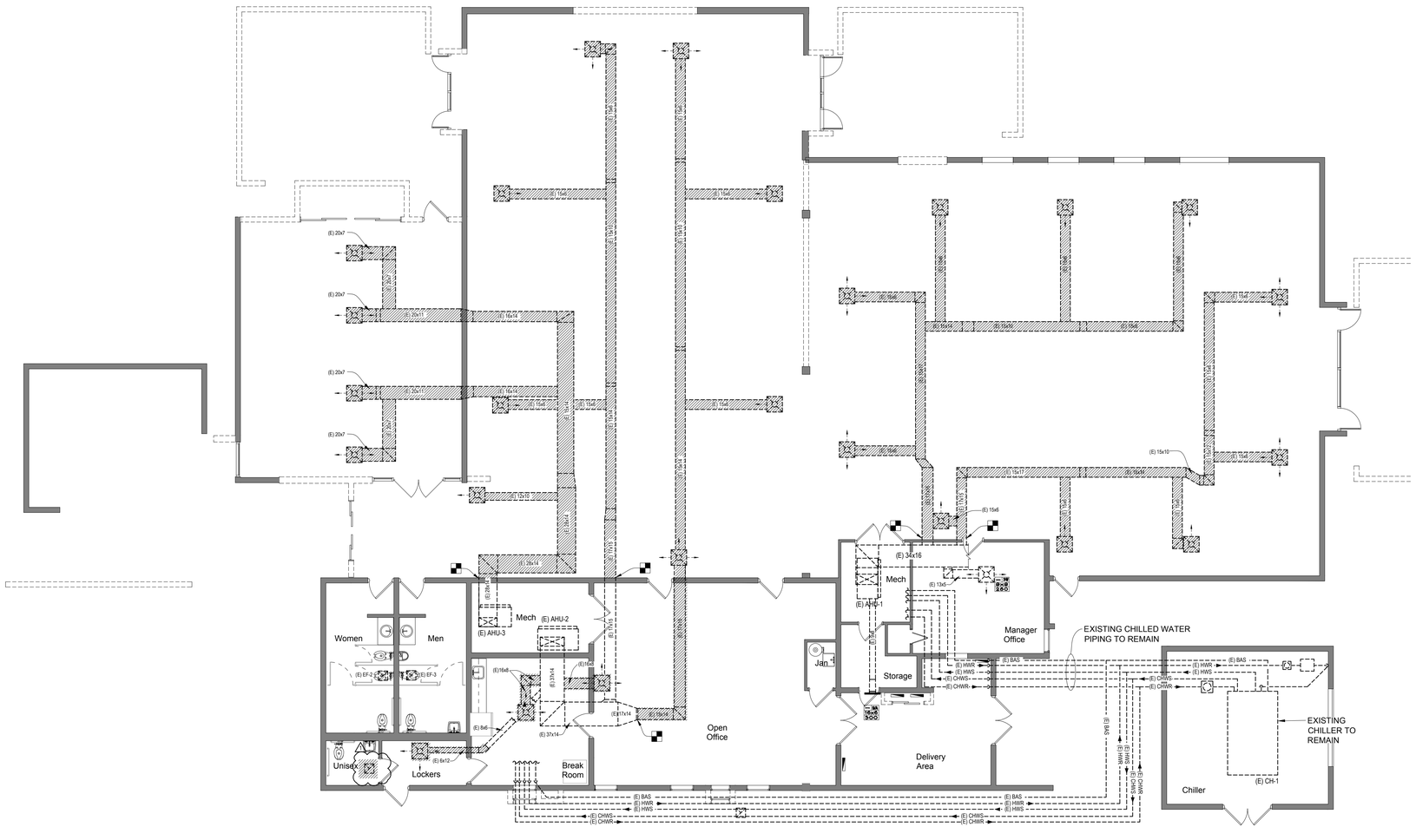

1 Floor Plan - Demolition - HVAC
MD3.0 Scale: 1/8" = 1'-0"

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REVISION	
1 OWNER CHANGES	08/28/23

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