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\\GEOFILED\CAD\F ON CAD\PUBLIC\CAD\AIR FORCE BASES\LITTLE ROCK\4454\WORKING MECH DRAWINGS\002 MECH DESIGN DRAWINGS\NEW GENERAL NOTES M-101-3 ROMENS S TEXT.DWG

UFC QUALITY STANDARDS & DESIGN PRINCIPLES			
<p>(continued)</p> <p>2.11.20.2.1 INLET AIR TEMPERATURE</p> <p>2.11.20.2.2 DISCHARGE AIR TEMPERATURE</p> <p>2.11.20.2.3 REHEAT VALVE POSITION</p> <p>2.11.20.2.4 AIR DAMPER POSITION</p> <p>2.11.20.2.5 AIR VOLUME</p> <p><b>2.12. TESTING AND BALANCING OF HVAC AIR AND WATER DISTRIBUTION SYSTEMS</b></p> <p>2.12.1. ALL NEW OR RENOVATED HVAC SYSTEMS SHALL BE TESTED AND BALANCED PURSUANT WITH AABC OR NEBB STANDARDS. THE CONTRACTOR MUST ALWAYS ENSURE THAT ONCE ALL WORK IS COMPLETE, THE MEDICAL TREATMENT FACILITY SPACES SHALL RECEIVE THE TEMPERED AIR CHANGES AT THE APPROPRIATE POSITIVE (OR WHERE REQUIRED BY UNIQUE FUNCTION, NEGATIVE PRESSURE) PRESSURE AS PRESCRIBED BY UFC 4-510-01 FOR THE SPECIFIC FUNCTION OR OCCUPANCY OF THAT SPACE. WHERE THE POINT OF WORK PERFORMED IS CONFINED TO A SEPARABLE SPACE (MEANING – SERVED FROM THE SAME AIR HANDLER), FLOOR OR TOWER, THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THE SYSTEM BALANCE, AIR CHANGES, PRESSURES, CHW AND HW FLOWS, AIR AND WATER TEMPERATURE DIFFERENTIALS ARE ACHIEVED IN THOSE SYSTEMS AND SPACES.</p> <p>2.12.2. THE TEST AND BALANCE (TAB) CONTRACTOR SHALL BE CERTIFIED BY AABC OR NEBB; AND SHALL BE AN INDEPENDENT TESTING AGENT, INDEPENDENT OF THE INSTALLING CONTRACTOR.</p> <p>2.12.3. FOR DESIGN-BUILD PROJECTS, TAB REPORTS MUST BE REVIEWED, APPROVED AND SIGNED OFF BY THE DESIGN ENGINEER OF RECORD PRIOR TO BEING SUBMITTED TO THE GOVERNMENT.</p> <p>2.12.4. WHERE THE TAB AGENT IS NOT CONSTRAINED BY THE DESIGN AND HAS LATITUDE IN SETTING FAN, MOTOR AND/OR PUMP PERFORMANCE, THE TAB AGENT SHALL MAKE ADJUSTMENTS AS NEEDED TO OPTIMIZE INFECTION CONTROL, OCCUPANT COMFORT AND ENERGY EFFICIENCY (IN THAT ORDER).</p> <p>2.12.5. TAB SHALL BE ACCOMPLISHED FOR ANY SYSTEM DOWNSTREAM OF THE EQUIPMENT TOUCHED.</p> <p>2.12.6. WHEN A COMPLETE SYSTEM (‘COMPLETE SYSTEM’ CONFINED TO AHU OR SEPARATE AIR DISTRIBUTION SYSTEM) TAB IS REQUIRED, THE TESTED SYSTEM(S) SHOULD BE IDENTIFIED INDIVIDUALLY IN THE SCOPE OF WORK (SOW IN THE RFP AND THE SUBSEQUENT PROPOSAL.</p> <p>2.12.6.1. TEST AND BALANCING MINIMUM REQUIREMENTS:</p> <p>2.12.6.2. FOUR PART PROCESS ARE REQUIRED: SYSTEMS READINESS CHECK, TEST, ADJUST, AND FINAL BALANCE.</p> <p>2.12.6.3. WORK WITH CONTROLS CONTRACTOR TO CALIBRATE EMS SENSORS AND PROVIDE DAMPER ADJUSTMENTS TO COORDINATE VALUES WITH EMS.</p> <p>2.12.6.4. PROVIDE AIR AND WATER TEMPERATURE, PRESSURE, AND FLOW DATA FOR ALL DEVICES IN SYSTEM INCLUDING VALVES, DAMPERS, COILS, FANS, AND ETC, FOR BOTH COOLING AND HEATING MODES.</p> <p>2.12.6.5. PROVIDE ELECTRICAL MEASUREMENT DATA, IN BOTH HEATING AND COOLING MODES, AND ELECTRICAL OPERATING CHARACTERISTICS OF MOTORS.</p> <p>2.12.6.6. REPORT ALL VALUES THAT DO NOT MEET THE DESIGN REQUIREMENTS IN A SEPARATE AND DEDICATED REPORT TO THE ENGINEER AND OWNER FOR REVIEW.</p> <p>2.12.6.7. THE ABOVE REQUIREMENTS DO NOT EXCLUDE OTHER REQUIREMENTS BY NEBB AND AABC STANDARDS.</p> <p>2.12.6.8. WHEN PRESSURE INDEPENDENT VALVES OR DAMPERS ARE USED, THE TAB CONTRACTOR MUST BALANCE THE SYSTEMS TO SET MAXIMUM FLOWS, TO ENSURE THE SYSTEM HAS SUFFICIENT WATER OR AIR SUPPLIES, AND TO VERIFY ACTUAL PRESSURE DIFFERENTIAL READINGS ACROSS EACH VALVE OR DAMPER AS DESIGNED.</p> <p><b>2.13. DUCTWORK</b></p> <p>2.13.1. DUCTWORK SHALL BE DESIGNED PER SMACNA AND UFC 4-510-01.</p> <p>2.13.2. ABOVE CEILING SPACES SHALL NOT BE USED AS RETURN AIR PLENUM (SEE AFMSA ETL 2010-01 IN ATTACHMENT 2).</p> <p>2.13.3. WHERE DUCTS MUST BE LOCATED OUTSIDE THE BUILDING, PROVIDE DIMPLED METAL JACKETING WITH AN ANODIZED FINISH IN THE COLOR SELECTED TO BEST HARMONIZE ARCHITECTURALLY WITH THE BUILDING.</p> <p>2.13.4. PROVIDE ALL STAINLESS STEEL DUCT CONSTRUCTION, WITH SEAMLESS WELDED JOINTS; (TO INCLUDE ALL ACCESSORIES) DOWNSTREAM FROM EXHAUST HUMIDIFIERS OR HIGH EFFICIENCY FINAL FILTERS SERVING SURGICAL PROCEDURE SPACES. PROVIDE DRAIN NIPPLE WITH FLUG IN SS DUCT (I.E., OPERATING ROOMS,DENTAL SURGERY, LABOR &amp; DELIVERY, ETC.). SEE UFC 4-510-01 SECTION 7-11.5.1 FOR ADDITIONAL DETAILS.</p> <p>2.13.5. FLEX DUCT FOR SUPPLY AIR CONNECTING AIR DEVICES SHALL NOT EXCEED FIVE (5) FEET IN LENGTH. DO NOT USE FLEX DUCT FOR RA OR EX DUCT SYSTEMS. WHERE THE FACILITY IS UNDERGOING A RENOVATION INVOLVING COMPLETE REPLACEMENT OF CEILINGS AND CEILING MOUNTED AIR DEVICES THROUGHOUT A LARGE CONTINGIOUS SPACE, THE CONTRACTOR SHALL REPLACE THE ALL OLD/EXISTING FLEX DUCT NEW.</p> <p>2.13.6. DUCTWORK DESIGN SHALL USE LONG RADIUS ELBOWS AS MUCH AS PRACTICAL.</p> <p>2.13.7. SUPPLY, RETURN AND OUTDOOR AIR DUTWORK SHALL BE EXTERNALLY INSULATED.</p> <p>2.13.8. DUCT CLEANING.</p> <p>2.13.8.1. WHEN A SPACE IS UNDER A MAJOR RENOVATION, OR BEING “GUTTED OUT,” DO NOT REUSE EXISTING DUCT IF THE DUCT (OR A SECTION THEREOF WITHIN THE SPACE) IS: A) INTERNALLY INSULATED, B) DAMAGED OR, C) MORE THAN 30-YEAR OLD. DO NOT ATTEMPT TO CLEAN, BUT REPLACE THE DUCT IN THIS CASE.</p> <p>2.13.8.2. DUCT CLEANING SHALL ONLY BE CONSIDERED ON EXHAUST SYSTEMS AND PERHAPS ON RETURN SYSTEMS. THE MAJOR EXPECTED BENEFIT WILL BE IMPROVED AIR SYSTEM PERFORMANCE. CLEANING OF SUPPLY AIR DUCTS SHALL BE AVOIDED AND CONSIDERED ONLY AS AN EXCEPTIONAL LAST RESORT. CLEANING SUPPLY AIR DISTRIBUTION DUCTS AND COMPONENTS THAT ARE DOWNSTREAM OF THE FINAL FILTER BANK SHALL REQUIRE SPECIAL EXEMPTION AND PRIOR APPROVAL BYAFMSA/SC8B; WHO SHALL PROVIDE DETAILED GUIDANCE ON THE SPECIFIC METHODS TO BE EMPLOYED DURING THE CLEANING AND POST CLEANING START OF AIR DISTRIBUTION SYSTEMS.</p> <p>2.13.8.3. THE BEST APPROACH TO SUPPLY DUCT CLEANLINESS IS TO PREVENT THE CONTAMINATION OF SUPPLY DUCTS BY ENFORCING DILIGENT, PROPER, MAINTENANCE OF FILTERS AND FILTER HOLDING FRAMES. PREVENTION OF SUPPLY DUCT CONTAMINATION IS A MAJOR RESPONSIBILITY OF THE FACILITY MANAGER AND FACILITY MAINTENANCE PROVIDER. THE ASHRAE HVAC DESIGN MANUAL FOR HOSPITALS AND CLINICS WARNS AGAINST CLEANING SUPPLY AIR SYSTEMS AND STATES “THE CENTERS FOR DISEASE CONTROL (CDC) AND U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) ADVISE THAT THERE IS NO INDICATION THAT DUCT CLEANING RESULTS IN A LOWER INCIDENCE OF INFECTION OR OTHER HEALTH PROBLEMS (CDC 2001)” (SEE PAGE 98 OF THE AFOREMENTIONED ASHRAE PUBLICATION).</p> <p>2.13.8.4. WHERE EXHAUST AND RETURN AIR DUCT SYSTEM MUST BE CLEANED, THE DUCT CLEANING PROCESS MUST FOLLOW PROCEDURES PURSUANT TO GUIDELINES ESTABLISHED AND PUBLISHED BY ASHRAE AND THE NATIONAL AIR OF DUCT CLEANERS ASSOCIATION (NADCA).</p>	<p>2.13.8.5. ALL NEW DUCTWORK SHALL BE SEALED AND TESTED PER SMACNA STANDARD.</p> <p><b>2.14. INSULATION</b></p> <p>2.14.1. ALL INSULATION SHALL MEET OR EXCEED ASHRAE 90.1-2010 REQUIREMENTS.</p> <p>2.14.2. ALL INDOOR PIPING INSULATION SHALL UTILIZE PVC JACKETING SHALL HAVE A THICKNESS OF THAT LEAST 30 MIL. PVC SHALL MATCH LOCAL FLUID COLOR SCHEMES WHERE APPLICABLE. PAINTING IS NOT A SUBSTITUTE FOR PVC JACKETING, NOR WILL PVC BE PAINTED UNLESS SPECIFIED BY CODE.</p> <p>2.14.3. ALL OUTDOOR MECHANICAL INSULATION SHALL UTILIZE AN APPROPRIATE METALLIC JACKETING.</p> <p>2.14.4. ALL SUPPLY AND RETURN AIR DUCTWORK MUST BE INSULATED. OA DUCTWORK IN ATTIC SPACES SHALL BE INSULATED.</p> <p>2.14.5. IN AREAS OF KNOWN OR ANTICIPATED “CLIMBING” ON/OVER OF THE INSULATED COMPONENT BY PERSONNEL, WALKWAYS SHALL BE INSTALLED. IN AREAS WHERE THE INSTALLATION OF A WALKWAY IS NOT POSSIBLE DUE TO DIMENSIONAL CLEARANCE CONSTRAINTS, THE APPROPRIATE RIGID DURABLE INSULATION MATERIALS SHALL BE USED: CALCITE (OR APPROVED ALTERNATE) FOR STEAM / HEATING / DOMESTIC HOT WATER, FIBER FOAM (OR APPROVED ALTERNATE) FOR CHILLED WATER.</p> <p>2.14.6. WHERE ARMA-FLEX TYPE INSULATION MAY EXPOSED TO UV, IT SHALL BE COVERED WITH APPROPRIATE METALLIC UV REFLECTIVE JACKETING/SHEATHING.</p> <p>2.14.7. LEAVE NO INSULATION EXPOSED TO THE AIR STREAM IN ANY DUCTWORK OR EQUIPMENT. EXTERIOR DUCT WRAP INSULATION SHALL HAVE A FOIL VAPOR BARRIER.</p> <p>2.14.8. ALL CHILLED WATER LINES SHALL UTILIZE A COMPARTMENTALIZED VAPOR SEAL. VAPOR SEALS SHALL BE NO MORE THAN FOUR (4) INSULATION JOINTS IN LENGTH.</p> <p>2.14.9. INSULATING MATERIALS CONTAINING POLYISOCYANURATE WITH A SMOKE INDEX GREATER THAN 50 SHALL NOT BE UTILIZED IN AFMS FACILITIES.</p> <p><b>2.15. HUMIDITY CONTROL</b></p> <p>2.15.1. BUILDING SPACE HUMIDITY SHALL BE DESIGNED PER UFC 4-510-01.</p> <p>2.15.2. FOR SPACES FOR WHICH PRECISE RELATIVE HUMIDITY (RH) REQUIREMENT IS STATED UNDER UFC 4-510-01 APPENDIX A, HUMIDIFIERS SHALL BE PROVIDED AS NECESSARY TO MAINTAIN THE REQUIRED RH AT VAV TERMINALS.</p> <p>2.15.3. FOR SPACES WHERE HUMIDITY REQUIREMENTS ARE NOT SPECIFICALLY PRESCRIBED UNDER UFC 4-510-01 APPENDIX A, HUMIDITY CONTROL SHALL BE DESIGNED TO MAINTAIN AN ENVELOPE OF 30% TO 60% RH DURING NORMALLY OCCUPIED PERIODS. THE DESIGN ENGINEER SHALL DETERMINE THE INTERIOR RH BASED ON THE OUTDOOR AIR CONDITION AND INTERIOR LATENT LOADS. HUMIDIFIERS SHALL BE PROVIDED IF THE ANALYSIS INDICATES THAT RH WILL DROP BELOW 30% DURING PERIODS OF OCCUPANCY. IN THIS CASE, IT IS ACCEPTABLE TO PROVIDE A HUMIDIFIER AT THE OUTSIDE AIR MAKE UP UNIT (IF AVAILABLE) OR IN THE AHU’S TO IMPROVE GENERAL INDOOR RH CONDITION.</p> <p>2.15.4. ALL HUMIDIFIERS SHALL HAVE DUCT MOUNTED HIGH LIMIT HUMIDITY SENSORS TO PREVENT OVER HUMIDIFICATION OF THE SUPPLY AIR.</p> <p><b>2.16. REQUIREMENTS FOR SPECIAL/UNIQUE MEDICAL PROCEDURE ROOMS</b></p> <p>2.16.1 EACH OPERATION ROOM (OR), CARDIO CATH LAB AND OTHER SPACES WHERE MAJOR INVASIVE PROCEDURES ARE PERFORMED (E.G., ORTHOPEDIC SURGERY, ETC.) SHALL HAVE A LOCAL PRESSURIZATION MONITORING INDICATOR IN THE ADJACENT CORRIDOR.</p> <p>2.16.2 LASIK AND OTHER KERATOATOMY PROCEDURE ROOMS REQUIRE MORE STRINGENT/PRECISELY CONTROLLED TEMPERATURE AND HUMIDITY CONTROLS. THE HVAC DESIGN FOR THESE SPACES SHALL BE ABLE TO ACHIEVE AND MAINTAIN IN A STEAD STATE 68oF-72oF AND BETWEEN 40% AND 45% RELATIVE HUMIDITY WITHOUT OVERSHOOT.</p> <p><b>2.17. MECHANICAL GENERAL REQUIREMENTS</b></p> <p>2.17.1. WHEN MAKING REPAIRS, ALTERATIONS OR RENOVATING EXISTING INFRASTRUCTURE THAT REQUIRES MAJOR COMPONENT OR INFRASTRUCTURE SYSTEM REPLACEMENT, THE DESIGNER/CONTRACTOR SHALL NOT ASSUME THAT A “LIKE FOR LIKE” REPLACEMENT IS ACCEPTABLE. THE DESIGNER/CONTRACTOR SHALL LEVERAGE THE OPPORTUNITY TO IMPROVE THE SYSTEM THROUGH DILIGENT AND THOUGHTFUL RE-CALCULATION OF PERFORMANCE REQUIREMENTS AND EQUIPMENT SELECTION TO BETTER MEET THE EXISTING AND FUTURE LOAD/SERVICE REQUIREMENTS; REDUCE ENERGY CONSUMPTION, IMPROVE UPTIME RELIABILITY AND PROVIDE GREATER EASE OF MAINTENANCE.</p> <p>2.17.2. WHEN WORK IS DONE ON THE CHILLED WATER PLANTS OF BUILDINGS CLASSIFIED AS BEDDED HEALTHCARE OR AMBULATORY SURGERY CENTERS, BACKUP MECHANICAL COOLING OF SUFFICIENT CAPACITY TO CARRY THE LOAD IS REQUIRED AT ALL TIMES. THIS MEANS A MINIMUM OF TWO CHILLERS WITH EACH OF SUFFICIENT CAPACITY TO MEET ALL CRITICAL LOADS. AIRSIDE ECONOMIZERS ARE NOT SUFFICIENT FOR MAINTAINING SURGICAL OPERATIONS, EVEN DURING AN AVERAGE WINTER SEASON. SIMILARLY, THIS APPLIES TO WORK ON BOILERS AND HOT WATER SYSTEMS SUPPORTING AFMS PROPERTIES.</p> <p>2.17.3. IDENTIFY ALL PIPING AND INSTALL FLOW DIRECTION MARKERS AS SPECIFIED IN ANSI/ASME A13.1.ALPHA-NUMERIC CODE LOCATION REFERENCE MARKERS SHALL BE INSTALLED AT THE ENTERING AND LEAVING POINTS ON ALL PIPE INTERSECTIONS AND VALVE JUNCTIONS THAT CORRELATE TO NODE POINTS ON A SYSTEM SINGLE LINE DIAGRAM.</p> <p>2.17.4. ALL MOTORS CONTROLLED BY VARIABLE FREQUENCY (OR SPEED) DRIVES SHALL BE OF THE DESIGN THAT REDUCES OR ELIMINATES INDUCED TRANSIENT ROTOR VOLTAGE. THIS CAN BE EITHER MOTORS FITTED WITH GROUNDING ROTOR BRUSHES, CERAMIC BEARINGS OR OTHER AFMSA APPROVED TECHNOLOGY.</p> <p>2.17.5. THE INSTALLATION OF NEW OR ADDED MECHANICAL AND/OR ELECTRICAL EQUIPMENT TO ROOF TOPS SHOULD BE AVOIDED TO THE GREATEST EXTENT POSSIBLE. HOWEVER, WHEN IT IS NECESSARY TO INSTALL INFRASTRUCTURE SYSTEMS AND EQUIPMENT ON THE ROOF, SAID EQUIPMENT SHALL BE INSTALLED PER SECTION 5.1.17.9 OF THIS GUIDE AND IN GENERAL REQUIRE ROOF CURB AND FLASHING.</p> <p>2.17.6. ALL DEDICATED ELECTRONIC COOLING SYSTEMS SHALL BE STAND ALONE. PROVIDE REDUNDANCY AS REQUIRED BY THE USING AGENCY.</p> <p>2.16.7. UTILIZE A SEPARATE DEDICATED CHILLER TO SERVE CT SCANS, MRI OR OTHER SPECIAL HIGH INTENSITY HEAT LOAD EQUIPMENT IS PREFERRED WHERE PROVEN ECONOMICALLY FEASIBLE.</p> <p>2.16.8. ALL NEW CONSTRUCTION, REPLACEMENT, OR MAJOR RENOVATION PROJECTS MUST ACHIEVE AT LEAST A 14% ENERGY REDUCTION BELOW THE CURRENT ASHRAE STANDARD 90.1 PUBLISHED BASLINES. THE ULTIMATE GOAL IS A 30% ENERGY REDUCTION. THE FOLLOWING DESIGN STRATEGIES ARE ENCOURAGED IN ORDER TO ACHIEVE ENERGY REDUCTION GOALS:</p> <p>2.17.8.1. COOLING, HEATING AND PLUMBING EQUIPMENT SHALL BE HIGH EFFICIENCY TYPE. HIGH EFFICIENCY HEREIN IS DEFINED AS 14% OR BETTER MORE EFFICIENT THAN THE REQUIREMENTS IN THE MOST CURRENT IN ASHRAE 90.1 STANDARD. DESIGN CHILLERS AND BOILERS TO BE FULLY MODULATING TO MEET PARTIAL LOAD DEMANDS.</p> <p>2.17.8.2. HEAT RECOVERY SYSTEMS. HEAT RECOVERY SYSTEMS SHALL BE PROVIDED FOR ALL 100% OA SYSTEMS. COIL “RUN-AROUND” ENERGY RECOVERY SYSTEM MUST BE USED FOR 100% OA HVAC SYSTEMS. AIR-TO-AIR HEAT WHEELS SHALL NOT BE USED. HOWEVER, THE DESIGN TEAM IS ENCOURAGED TO LOOK FOR OTHER TECHNOLOGIES FOR WASTE HEAT RECOVERY. RESOURCES AVAILABLE FROM LABORATORIES FOR THE 21ST CENTURY INCLUDE BEST PRACTICES, TECH BULLETINS AND DESIGN (HTTP://WWW.LABS21CENTURY.GOV/INDEX.HTM).</p>	<p>2.17.8.3. IN MAJOR RENOVATION PROJECTS, THE DESIGN TEAM SHOULD CONVERT DOUBLE DUCT CONSTANT VOLUME HVAC SYSTEMS TO VAV TYPE. CONVERT 100% OA SYSTEMS TO RETURN AIR SYSTEMS WHENEVER PRACTICAL.</p> <p>2.17.8.4. DURING UNOCCUPIED PERIODS (PERIOD OF NON-USE FOR PROCEDURES OR WHEN VACANT), OPERATION ROOM AIR VOLUME SHALL BE REDUCED TO 6 AIR CHANGES PER HOUR, WHILE MAINTAINING A POSITIVE PRESSURE IN THE SURGERY ROOM OF 0.20” MINIMUM (REQUIRED AIR BALANCE). THE CONTROL FOR THE OCCUPIED/UN-OCCUPIED MODES SHALL BE AUTOMATED THROUGH THE USE OF ROOM OCCUPANCY SENSORS THAT WILL INITIATE A SWITCH TO UN-OCCUPIED MODE ONCE A 15 MINUTE (USER ADJUSTABLE) TIMED DELAY EXPIRES AFTER THE ROOM HAS BEEN VACATED; AND IT WILL SWITCH BACK TO OCCUPIED MODE FOLLOWING A 3 MINUTE DELAY ONCE OCCUPANCY HAS BEEN SENSED. AN ILLUMINATED VISUAL INDICATOR OF HVAC MODE (OCCUPIED / UN-OCCUPIED) SHALL BE PROVIDED WITHIN THE SURGERY ROOM. THE INDICATORS SHALL BE GREEN FOR ‘OCCUPIED MODE’ AND AMBER FOR ‘UN-OCCUPIED’ MODES.</p> <p>2.17.9. ENERGY PERFORMANCE DELIVERABLES.</p> <p>2.17.9.1. IDENTIFY THE ADOPTED ENERGY GOALS AND GENERAL STRATEGIES IN THE PROPOSAL. CONFIRM THE PROPOSED ENERGY SAVING GOAL IN PRE-DESIGN PHASE AND PROVIDE A BENCHMARK DURING THE DESIGN AND CONSTRUCTION. ENERGY SAVING GOALS WILL BE HEAVILY WEIGHTED IN THE PROJECT PROPOSAL EVALUATION.</p> <p>2.17.9.2. AT TIME OF FINAL COMMISSIONING AND ACCEPTANCE THE BUILDING CONTROLS SHALL SET AT THE DOD AND AFMS PRESCRIBED TEMPERATURE SET POINTS AND UNOCCUPIED SCHEDULES EMPLOYED FOR ENERGY CONSERVATION.</p> <p>2.17.9.3. AREA TEMPERATURE SETBACK SCHEDULES AND EXHAUST FAN SHUT DOWN SHALL BE UTILIZED FOR CLINICS AND HOSPITAL AREAS THAT ARE UNOCCUPIED AFTER NORMAL BUSINESS HOURS.</p> <p><b>INDOOR AIR QUALITY</b></p> <p>2.18.1. MINIMUM OUTSIDE AIR (OA) VENTILATION. PROVIDE MINIMUM OA IN COMPLIANCE WITH UFC 4-510-01 AND DOCUMENT IN THE PROJECT DESIGN NARRATIVE. THE FINAL COMMISSIONING SHALL VERIFY THE REQUIRED MINIMUM OA VENTILATION.</p> <p>2.18.2. OUTDOOR AIR DELIVERY MONITORING. WHEN AN AHU IS REPLACED, PROVIDE OUTSIDE AIR (OA) FLOW STATIONS TO CONTROL AND MONITOR OA FLOWS. USE SPACE CO2 SENSORS TO RESET OA IN WAITING ROOMS, CONFERENCE ROOMS, CLASSROOMS, BREAK ROOMS, LARGE OPEN SPACE OFFICE AREAS AND OTHER HIGHLY OCCUPIED AREAS. CO2 SENSORS SHALL BE WALL MOUNTED BETWEEN 3’-0” TO 6’-0” ABOVE FINISH FLOOR. RETURN AIR DUCT MOUNTED CO2 SENSORS SHALL NOT BE USED FOR OA CONTROLS. PROVIDE OA FLOW STATIONS THAT ARE NOT SUBJECT TO CLOGGING.</p> <p>2.18.3. INDOOR CHEMICAL AND POLLUTANT SOURCE CONTROL. PROVIDE SEPARATE EXHAUST AND PLUMBING SYSTEMS FOR ROOMS WITH CONTAMINANTS.</p> <p>2.18.4. HVAC CONTROL SYSTEMS SHALL USE TRENDING AND MONITORING FUNCTION TO MONITOR SPACE TEMPERATURES AND HUMIDITY.</p> <p><b>3.1. PIPING</b></p> <p>3.1.1. SANITARY SEWER (SS) MAIN AND BUILDING SS OUTLETS SHALL NOT BE LESS THAN 6 INCH DIAMETER.</p> <p>3.1.2. ALL NEW BUILDINGS SHALL PROVIDE SEPARATE CONDENSATE HUB DRAINS AND SEPARATE PIPING SYSTEM FOR FUTURE CONDENSATE COLLECTION SYSTEM. WHENEVER PRACTICAL FOR RENOVATION PROJECTS, COLLECT COOLING COIL CONDENSING WATER FOR NON-POTABLE WATER APPLICATIONS SUCH AS IRRIGATION OR COOLING TOWER MAKEUP.</p> <p>3.1.3. AVOID CREATING STAGNANT DOMESTIC HOT WATER PIPING SECTIONS, E.G. DEAD LEGS. DOMESTIC HOT WATER PIPING DEAD LEGS SHALL NOT EXCEED THREE FEET (3-FT).</p> <p>3.1.4 THE TIME TAKEN FOR THE DOMESTIC HOT WATER TO REACH DESIGN TEMPERATURE AT AN FIXTURE OUTLET SHALL NOT EXCEED 10 SECONDS.</p> <p><b>3.2. MATERIALS</b></p> <p>3.2.1. USE SCH 80 PVC OR POLYETHYLENE FOR PURIFIED WATER SYSTEMS SUCH AS DIALYSIS AREAS.</p> <p>3.2.2 INSULATING MATERIALS CONTAINING POLYISOCYANURATE WITH A SMOKE INDEX GREATER THAN 50 SHALL NOT BE UTILIZED IN AFMS FACILITIES.</p> <p><b>3.3. FIXTURES</b></p> <p>3.3.1. PLUMBING FIXTURE SHALL BE LOW FLOW TYPE AND SHALL NOT EXCEED THE FOLLOWING WATER FLOW RATES FOR GENERAL PURPOSE FIXTURES.</p> <p>DOUBLE FLUSH TOILETS IN WOMEN’S 1.0/1.6 GPF</p> <p>LOW FLOW URINALS 1.0 GPF</p> <p>LOW FLOW LAVATORY 0.5 GPM</p> <p>LOW-FLOW SHOWER 1.0 GPM</p> <p>LOW FLOW MOP SINK 1.0 GPM</p> <p>NOTE: WATERLESS URINALS ARE NOT ALLOWED.</p> <p><b>3.4. USE NON POTABLE WATER FOR COOLING OF VACUUM PUMPS, AIR COMPRESSORS, OR MECHANICAL SEALS ON PUMPS.</b></p> <p><b>3.5. METER. ALL NEW METERS SHALL HAVE CAPABILITIES FOR A FUTURE ENERGY MONITORING SYSTEM APPLICATION.</b></p> <p>3.5.1. WATER METERS (TO BE DEVELOPED)</p> <p>3.5.2. GAS METER</p> <p>3.5.2.1. THE PREFERRED GAS METER IS: SIERRA 6205-BT MASS FLOW METER WITH PULSE OPTION; SOLA SCP 30515-DN 15VDC POWER SUPPLY; SOLID STATE INSTRUMENTS RTR-2+5-BVDC HIGH SPEED ISOLATION RELAY. THE POWER SUPPLY AND ISOLATION RELAY CAN BE ASSEMBLED IN THE SAME ENCLOSURE.</p> <p><b>GENERAL REQUIREMENTS APPLICABLE TO ALL DISCIPLINES</b></p> <p>6.1 REMOVAL OF ABANDONED INFRASTRUCTURE (MECHANICAL, ELECTRICAL AND STRUCTURAL) – THE AFMS DESIRES TO LEVERAGE ANY OPPORTUNITY TO CLEAR ITS PHYSICAL PLANTS OF ABANDONED INFRASTRUCTURE WHICH INCLUDES, BUT IS NOT LIMITED TO OLD WIRING, CONDUITS, PNEUMATIC CONTROL TUBING, JUNCTION BOXES, PIPES, FLUES, HOUSE KEEPING PADS, SUPPORTS AND HANGERS, ETC.) WHERE A CONTRACTOR IS TO PERFORM WORK IN A MECHANICAL SPACE (MECHANICAL ROOM, UTILITY PLANT, AIR HANDLER ROOM, ELECTRICAL CLOSET, ETC.) THAT CONTRACTOR SHALL INCLUDE A SEPARATE FEATURE FOR THE REMOVAL OF ALL ABANDONED EQUIPMENT, PIPING, DUCTWORK, ELECTRICAL WIRING AND PNEUMATIC LINES OR DEVICES WITHIN THE SPACES WHERE WORK TAKES PLACE UNDER THE PROPOSED CONTRACT. THIS IS TO INCLUDE THE REMOVAL OF ALL ABANDONED INFRASTRUCTURE THAT IS FOUND WITHIN THE SPACES PRIOR TO THE START OF WORK. TYPICALLY, THE CONDUIT, RACE, TUBING OR WIRING SHALL BE REMOVED BACK TO EITHER THE FIRST USABLE JUNCTION BOX OR POINT WHERE IT ENTERS THE SPACE.</p>	<p>6.2 JUNCTION BOXES AND CONTROL PANEL BOXES – OLD LARGE PNEUMATIC CONTROL PANELS, OR LARGE INAPPROPRIATELY SIZED JUNCTION BOXES ARE TO BE REMOVED AND EITHER NOT USED AS JUNCTION BOXES OR “RIGHT SIZED” TO A SMALLER BOXES MORE SUITED FOR THE REQUIREMENTS GOING FORWARD. LARGE EP CONTROL BOXES THAT HAVE BEEN ABANDONED SHALL BE REMOVED AND NOT USED AS A FEED-THROUGH PULL BOX FOR CONTROL WIRING.WHERE WIRING PASSES THROUGH SUCH A PANEL, THE PANEL IS TO BE REPLACED WITH AN APPROPRIATELY SIZED ELECTRICAL JUNCTION BOX, CONDUIT EXTENDED TO CONNECT SAID JUNCTION BOX AND THE WIRING RE-PULLED THROUGH THE JUNCTION BOX. ELECTRICAL INFRASTRUCTURE – OLD ELECTRICAL RACEWAYS AND BUS WORK WHERE THE CIRCUITS ARE/WORK NO LONGER REQUIRED FOLLOWING YOUR WORK AND THUS DE-ENERGIZED SHALL BE REMOVED BACK TO THE MOST UPSTREAM POINT OF DISCONNECT WITHIN THE ROOM OR SPACE. AT THIS POINT, THE CONDUCTORS SHALL BE TERMINATED IN AN APPROVED METHOD, THE TERMINATION BOX SHALL BE MADE SAFE AND PROVIDE SUITABLE PROTECTION AND THE TERMINATED CIRCUITS SHALL BE MARKED AS DE-ENERGIZED BOTH AT THE POINT OF TERMINATION AND AT THE SERVICE POINT (BREAKER, FUSED DISCONNECT, OR SWITCH FEEDING THE CIRCUIT). WIRE ENDS SHALL BE TERMINATED AS TO PRESENT A NEAT AND SAFE APPEARANCE WITHOUT HANGING STRANDS OR INSULATION.</p> <p>6.4 PNEUMATIC CONTROL INFRASTRUCTURE – OLD PNEUMATIC CONTROL, MECHANICAL UTILITY INFRASTRUCTURE PIPING (CHW, HW, STEAM, ETC.) AND PLUMBING WHICH ARE/WERE NO LONGER REQUIRED FOLLOWING YOUR WORK AND THUS DRAINED WITHIN THE ROOM OR SPACE. THE PVC AND COPPER CONTROL TUBING SHALL BE CUT IN AN APPROVED MANNER WITHIN 6” OF WHERE IT ENTERS THE MECHANICAL ROOM OR SPACE AND THE ENDS OF THE TUBING SHALL BE PLUGGED OR CAPPED WITH A RUBBER STOPPER OR CAP. UNMARKED APPROPRIATELY AND SECURED NEATLY IN AN APPROVED PROFESSIONAL APPEARING MANNER. SIMILARLY, ALL FERROUS METAL PIPING THAT IS NO LONGER REQUIRED AS A RESULT OF WORK PERFORMED SHALL BE TERMINATED BACK TO WITHIN 12” OF THE WALL OR PARTITION WHERE IT ENTERS THE MECHANICAL SPACE, CUT AND SEALED IN AN APPROVED MANNER. ON PIPES 1” OR SMALLER, THE ENDS WILL BE CUT, THREADED, AND AN APPROVED PIPE CAP INSTALLED (EXCEPTION IS PVC WHERE A GLUED SLIP-ON CAP WILL BE ACCEPTED). ON PIPES 1 1/4” OR LARGER, THE ENDS OF THE PIPE SHALL BE CUT SMOOTH AND EITHER A BLIND FLANGE OR A SOLID METAL PIPE CAP SHALL BE WELDED ONTO THE END OF THE PIPE. ALL WELDMENTS SHALL BE PAINTED AS REQUIRED TO PROVIDE CORROSION CONTROL. THE PIPES SHALL BE MARKED AT THE POINT OF TERMINATION AND POINT OF SERVICE TO INDICATE THAT THE PIPE IS ABANDONED AND THE LOCATION OF THE OPPOSITE END.</p> <p>6.5. STRUCTURAL SUPPORTS – OLD HANGERS, BRACKETS, ALL-THREAD SUSPENSION AND SADDLES FOR ALL INFRASTRUCTURE REMOVED BY THE CONTRACTOR SHALL ALSO BE REMOVED BACK TO THE POINT OF ANCHOR. ANY DAMAGE (DAMAGE IS CONSIDERED BUT NOT LIMITED TO; HOLES, DIVOTS, CRACKS, VOIDS, WATER INFILTRATION) TO THE STRUCTURE MUST BE REPAIRED TO MATCH EXISTING AND SURROUNDING MATERIALS IN SIZE, TEXTURE, AND COLOR.</p> <p>6.6. EQUIPMENT MOUNTS AND FOUNDATIONS – OLD HOUSEKEEPING PADS, FLOOR MOUNTS, CATCH TRAYS/BASIS AND RAISED ISOLATION BLOCKS FOR EQUIPMENT REMOVED BY THE CONTRACTOR SHALL BE REMOVED TO THE ORIGINAL FLOOR SURFACE GRADE. NEW HOUSEKEEPING PADS SHALL BE SIX-INCH (6”) HIGH AS A MINIMUM.</p> <p>6.7 PLACEMENT OF ELECTRICAL AND MECHANICAL EQUIPMENT – THE PREFERRED LOCATION OF ELECTRICAL AND MECHANICAL EQUIPMENT SUCH AS TRANSFORMERS, AIR-COOLED CONDENSERS, AND PACKAGED CHILLERS IS OUTSIDE THE UNOBSTRUCTED SPACE. HOWEVER THIS STANDARD DOES NOT PRECLUDE PLACEMENT WITHIN THE UNOBSTRUCTED SPACE AS LONG AS THE EQUIPMENT PROVIDES NO OPPORTUNITY FOR CONCEALMENT OF EXPLOSIVE DEVICES.</p> <p>6.8 ENCLOSURE SECURITY REQUIREMENTS FOR GROUND MOUNTED EXTERIOR EQUIPMENT (CHILLERS, GENERATORS, PACKAGED APPARATUS, ETC). ALL EQUIPMENT AND INSTALLATION MUST COMPLY WITH ATFP UFC-4-010-01 AND LOCAL BASE SECURITY REQUIREMENTS.</p> <p>6.9 ANTITERRORISM FORCE PROTECTION (ATFP) AIR HANDLER EMERGENCY SHUTDOWN “RED BUTTON” SYSTEMS SHALL BE INSTALLED PER ENGINEERING TECHNICAL LETTER (ETL) 2011-1 EMERGENCY AIR DISTRIBUTION SHUTOFF IN MEDICAL FACILITIES, DATED 1 JUNE 2011 (SEE ATTACHMENT 3).</p> <p>6.10 CORROSION CONTROL OF EXTERIOR MOUNTED PACKAGED ASSEMBLIES AND ENCLOSURES</p> <p>6.10.1 GENERAL FINISHES – ALL EXPOSED EXTERIOR METAL SURFACES ON MECHANICAL, ELECTRICAL EQUIPMENT AND STRUCTURAL SYSTEMS/ASSEMBLIES SHALL BE EITHER UV RESILIENT ANODIZED, FACTORY ELECTROSTATIC APPLIED THERMALLY SET POWDER COAT PAINTED OR HOT-DIPPED GALVANIZED. FINISHES SHALL BE EITHER MATE OR SEMI-GLOSS. COLOR SHALL BE LIGHT AND UNLESS CONCEALED BY A VISUAL BARRIER, IT SHALL MATCH OR COMPLIMENT THE ESTHETICS OF THE NEARBY BUILDING PRIMARY OR TRIM COLOR. WHERE THE LOCAL BASE CIVIL ENGINEER HAS ESTABLISHED AND PUBLISHED BASE ARCHITECTURAL PLAN, THE EQUIPMENT SHALL COMPLY TO THE GREATEST EXTENT POSSIBLE WITH SAID PLAN.</p> <p>6.10.2. CORROSION CONTROL OF EXTERIOR EXPOSED HEAT TRANSFER COILS (AIR COOLED CHILLERS AND ROOF-TOP UNIT CONDENSERS, GENERATOR RADIATORS, ETC) – WHERE THE MOC IS LOCATED WITHIN 50 NAUTICAL MILES OF AN OCEAN OR INDUSTRIAL AREA WHERE THE AIR IS LADEN WITH CORROSIVE VAPORS, ALL EXTERIOR LOCATED HEAT TRANSFER SYSTEM COILS (ALUMINUM, COPPER, BRASS) SHALL BE COATED WITH HERESITE CORROSION PREVENTION AS NECESSARY TO EXTEND THE LIFE OF THE COILS AND PROTECT AGAINST ADVANCE DETERIORATION DUE TO SALT SPRAY OR OTHER CORROSIVES IN THE LOCAL AIR.</p> <p>6.10.3. FIELD APPLIED SPRAYED/BRUSHED PAINT AND/OR COLD APPLICATION GALVANIZE IS NOT ACCEPTABLE AND ONLY AUTHORIZED ON PIPE WELDMENTS AND THREADED CONNECTIONS THAT COULD NOT BE PRE-ASSEMBLED AT THE FACTORY. ALL WELDMENTS SHALL BE CLEANED, PRIMED AND PAINTED WITH A FINISHED COLOR THAT EITHER MATCHES THE MAIN ASSEMBLY, OR OF THE APPROPRIATE COLOR WHERE REQUIRED BY LOCAL STATUTE OR SAFETY CODE. ALL ASSEMBLY BOLTS AND HARDWARE (UNLESS FACTORY PAINTED DURING ASSEMBLY) SHALL BE EITHER ZINC PLATED OR HOT DIP GALVANIZED.</p> <p>6.11. WARRANTY OF AFMS MECHANICAL &amp; ELECTRICAL SYSTEMS</p> <p>6.11.1. EQUIPMENT &amp; MATERIALS: ALL MATERIALS AND EQUIPMENT SHALL CARRY A 24 MONTH FULL SERVICE WARRANTY FROM THE CONTRACTOR FOR MANUFACTURER DEFECT, FAILURE TO PERFORM IN TERMS OF RELIABILITY, EFFICIENCY, SAFE OPERATION BY CLASSIFICATION (CONTINUOUS OR INTERMITTENT USE), AND ITS ABILITY TO MAINTAIN STEADY STATE PRODUCTION AT A SUSTAINED LOAD LEVEL AS PRESCRIBED IN THE SYSTEM DESIGN, AND/OR AS PRESCRIBED BY THE EQUIPMENT MANUFACTURER.</p> <p>(continued on next page)</p>

CAD Filename. New General Notes M-101-3 Romens S Text.dwg			
ORIGINAL SHEET SIZE: D SIZE 36x24		DATE REVISED	
ADDITIONS AND REVISIONS			
35% DESIGN DRAWINGS		10/04/2013	
65% DESIGN DRAWINGS		11/27/2013	
65% DESIGN DRAWINGS – REVISION <u>A</u>		1/10/2014	
100% DESIGN DRAWINGS		2/21/2014	
			
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<b>GENERAL NOTES</b> 19TH MEDICAL SUPPORT GROUP JACKSONVILLE, AR REPAIR OF BUILDING INFRASTRUCTURE SYSTEMS			
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JWT BJK - SEE PAGE OCTOBER 2013		Sheet No.   M-102	

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