MECHANICAL SPECIFICATIONS

TESTING, BALANCING AND ADJUSTING

1. SECTION INCLUDES BALANCE, ADJUST AND TEST THE AIR DISTRIBUTION SYSTEM INCLUDING THE EXHAUST SYSTEM. BALANCE, ADJUST AND TEST RELATED HYDRONIC SYSTEM.
2. TAB TOLERANCES THE WATER, OUTSIDE AIR, SUPPLY AIR, RETURN AIR, AND EXHAUST AIR FOR EACH SYSTEM SHALL BE ADJUSTED TO WITHIN +/- 5% OF THE VALUE SCHEDULED ON THE DRAWINGS.
3. TESTING THE SYSTEM THE TAB AGENCY SHALL VERIFY THAT ALL DUCTWORK, DAMPERS, GRILLES, REGISTERS, AND DIFFUSERS HAVE BEEN INSTALLED PER DESIGN.

   1. SUPPLY FANS:
      A. FAN SPEEDS: TEST AND ADJUST FAN RPM TO ACHIEVE DESIGN CFM REQUIREMENTS.
      B. CURRENT AND VOLTAGE: TEST AND RECORD MOTOR VOLTAGE AND AMPERAGE AND COMPARE DATA WITH THE NAMEPLATE LIMITS TO ENSURE FAN MOTOR IS NOT IN OR ABOVE THE SERVICE FACTOR.
      C. PITOT-TUBE TRAVERSE: PERFORM A PITOT-TUBE TRAVERSE OF THE MAIN SUPPLY AND RETURN DUCTS, AS APPLICABLE, TO OBTAIN TOTAL CFM. MEASUREMENTS MUST BE RECORDED WITH AN INCLINED MANOMETER OR AN INCLINED/VERTICAL MANOMETER.
      D. OUTSIDE AIR: TEST AND ADJUST THE OUTSIDE AIR ON APPLICABLE EQUIPMENT USING A PITOT-TUBE TRAVERSE.
      E. STATIC PRESSURE: TEST AND RECORD SYSTEM STATIC PRESSURE, INCLUDING THE STATIC PRESSURE PROFILE OF EACH SUPPLY FAN.

   2. ALL OTHER FANS:
      A. FAN SPEEDS: TEST AND ADJUST FAN RPM TO ACHIEVE DESIGN CFM REQUIREMENTS
      B. CURRENT AND VOLTAGE: TEST AND RECORD MOTOR VOLTAGE AND AMPERAGE AND COMPARE DATA WITH THE NAMEPLATE LIMITS TO ENSURE FAN MOTOR IS NOT IN OR ABOVE THE SERVICE FACTOR.
      C. PITOT-TUBE TRAVERSE: PERFORM A PITOT-TUBE TRAVERSE OF THE MAIN RETURN DUCTS, AS APPLICABLE, TO OBTAIN TOTAL CFM. MEASUREMENTS MUST BE RECORDED WITH AN INCLINED MANOMETER OR AN INCLINED/VERTICAL MANOMETER.
      D. STATIC PRESSURE: TEST AND RECORD SYSTEM STATIC PRESSURE, INCLUDING THE STATIC PRESSURE PROFILE OF EACH RETURN FAN.

   3. COILS (INCLUDING ELECTRIC COILS):
      A. AIR TEMPERATURE: ONCE AIR FLOWS ARE SET TO ACCEPTABLE LIMITS, TAKE WET BULB (COOLING COIL ONLY) AND DRY BULB AIR TEMPERATURES ON THE ENTERING AND LEAVING SIDE OF EACH COIL. CALCULATE THE SENSIBLE AND LATENT (COOLING COIL ONLY) CAPACITY OF THE COIL.

   4. HYDRONIC COILS:
      A. TOLERANCES: TEST, ADJUST, AND BALANCE WATER COILS WITHIN 5%%% OF DESIGN FLOW REQUIREMENTS.
      B. VERIFICATION: VERIFY THE TYPE, LOCATION, FINAL PRESSURE DROP AND WATER QUANTITY (GPM) OF EACH COIL. CALCULATE THE ACTUAL CAPACITY OF ALL COILS.

   5. REVIEW THE RETURN AIR PATH FOR EACH AREA SERVED BY AIR HANDLING UNITS TO ENSURE A CORRECT OPERATING SYSTEM.

4. EQUIPMENT POWER READINGS (RECORD THE FOLLOWING INFORMATION FOR EACH MOTOR)
   1. EQUIPMENT DESIGNATION.
   2. MANUFACTURER.
   3. UNIT MODEL NUMBER AND SERIAL NUMBER AND FRAME.
   4. MOTOR NAMEPLATE HORSEPOWER; NAMEPLATE VOLTAGE; PHASE AND FULL LOAD AMPERES.
   5. HEATER COIL IN STARTER.
      A. RATING IN AMPERES.
      B. MANUFACTURER'S RECOMMENDATION.
   6. MOTOR RPM/DRIVEN EQUIPMENT RPM.
   7. POWER READING (VOLTAGE, AMPERES OF ALL LEGS AT MOTOR TERMINALS).

5. DIRECT EXPANSION EQUIPMENT (WITH EACH UNIT OPERATING AT NEAR DESIGN CONDITIONS, MEASURE AND RECORD THE FOLLOWING)
   1. MANUFACTURER, MODEL NUMBER, SERIAL NUMBER AND ALL NAMEPLATE DATA.
   2. AMBIENT TEMPERATURE, CONDENSER DISCHARGE TEMPERATURE.
   3. AMPERAGE AND VOLTAGE FOR EACH PHASE.
   4. LEAVING AND ENTERING AIR TEMPERATURES.
   5. SUCTION AND DISCHARGE PRESSURES AND TEMPERATURES.
   6. TONS OF COOLING.

6. TAB REPORT
   1. THE ACTIVITIES DESCRIBED IN THIS SPECIFICATION SHALL BE RECORDED IN A REPORT FORM. NEATLY TYPE AND ARRANGE DATA. INCLUDE WITH THE DATA THE DATE TESTED, PERSONNEL PRESENT, WEATHER CONDITIONS, NAMEPLATE RECORD OF THE TEST INSTRUMENTS USED AND LIST ALL MEASUREMENTS TAKEN AFTER ALL CORRECTIONS ARE MADE TO THE SYSTEM. PROVIDE A "PREFACE" WHICH SHALL INCLUDE A GENERAL DISCUSSION OF THE SYSTEM AND ANY ABNORMALITIES OR PROBLEMS ENCOUNTERED. SUBMIT PDF ELECTRONIC COPY TO THE ARCHITECT AND ENGINEER.
   2. ALL MEASUREMENTS AND RECORDED READINGS (OF AIR, WATER, ELECTRICITY, ETC.) THAT APPEAR IN THE REPORT MUST HAVE BEEN RECORDED ON SITE BY THE PERMANENTLY EMPLOYED TECHNICIANS OR ENGINEERS OF THE TAB FIRM.
   3. SUBMIT REPORTS ON FORMS APPROVED BY THE ENGINEER THAT WILL INCLUDE THE FOLLOWING DATA AS A MINIMUM: TITLE PAGE: COMPANY NAME, COMPANY ADDRESS, COMPANY TELEPHONE NUMBER, PROJECT NAME, PROJECT LOCATION, PROJECT MANAGER, PROJECT ENGINEER, PROJECT CONTRACTOR, SUMMARY OF THE TAB REPORT DATA, INDEX
   4. FAN DATA: LOCATION, MANUFACTURER, MODEL, AIR FLOW, SPECIFIED AND ACTUAL, TOTAL STATIC PRESSURE (TOTAL EXTERNAL) SPECIFIED AND ACTUAL, INLET PRESSURE, DISCHARGE PRESSURE, FAN RPM
   5. RETURN AIR/OUTSIDE AIR DATA: IDENTIFICATION/LOCATION, DESIGN RETURN AIRFLOW, ACTUAL RETURN AIRFLOW, DESIGN OUTSIDE AIRFLOW, ACTUAL OUTSIDE AIR FLOW, RETURN AIR TEMPERATURE, OUTSIDE AIR TEMPERATURE, REQUIRED MIXED AIR TEMPERATURE, ACTUAL MIXED AIR TEMPERATURE
   6. ELECTRIC MOTORS: MANUFACTURER, HP/BHP, PHASE, VOLTAGE, AMPERAGE, NAMEPLATE, ACTUAL, RPM, SERVICE FACTOR, STARTER SIZE, HEATER ELEMENTS, RATING.
   7. V-BELT DRIVE: IDENTIFICATION/LOCATION, REQUIRED DRIVEN RPM, DRIVE SHEAVE, DIAMETER AND RPM, BELT, SIZE AND QUANTITY, MOTOR SHEAVE, DIAMETER AND RPM, CENTER-TO-CENTER DISTANCE, MAXIMUM, MINIMUM AND ACTUAL
   8. DUCT TRAVERSE: SYSTEM ZONE/BRANCH, DUCT SIZE, AREA, DESIGN VELOCITY, DESIGN AIRFLOW, TEST VELOCITY, TEST AIRFLOW, DUCT STATIC PRESSURE, AIR CORRECTION FACTOR.
   9. COIL DATA: IDENTIFICATION/NUMBER, LOCATION, SERVICE, MANUFACTURER, ENTERING AIR DB TEMPERATURE, DESIGN AND ACTUAL, LEAVING AIR DB TEMPERATURE, DESIGN AND ACTUAL, WATER PRESSURE FLOW, DESIGN AND ACTUAL, WATER PRESSURE DROP, DESIGN AND ACTUAL, ENTERING WATER TEMPERATURE, DESIGN AND ACTUAL, J. LEAVING WATER TEMPERATURE, DESIGN AND ACTUAL, AIR PRESSURE DROP, DESIGN AND ACTUAL, CAPACITY
   10. ELECTRIC COIL DATA: IDENTIFICATION/NUMBER, LOCATION, SERVICE, MANUFACTURER, ENTERING AIR DB TEMPERATURE, DESIGN AND ACTUAL, LEAVING AIR DB TEMPERATURE, DESIGN AND ACTUAL, ELECTRICAL CHARACTERISTICS, CAPACITY

REFRIGERANT PIPING

A. REFRIGERANT PIPING: TYPE K HARD-DRAWN COPPER TUBING WITH SWEAT-TYPE, WROUGHT COPPER FITTINGS. CAST FITTINGS ARE NOT PERMITTED.
B. PRESSURE TEST: CHARGE THE SYSTEM WITH DRY NITROGEN AND TEST TO 300 PSIG. TEST JOINTS WITH A HALIDE TORCH OR AN ELECTRONIC LEAK DETECTOR. RETEST SYSTEM UNTIL PROVEN TIGHT.
C. EVACUATION AND DRYING: AFTER REFRIGERANT SYSTEM HAS BEEN PRESSURE TESTED, CONNECT A SUITABLE VACUUM PUMP AND EVACUATE PIPING SYSTEM, INCLUDING LINES AND EQUIPMENT. MAINTAIN A VACUUM AS HIGH AS PRACTICABLE FOR LONG ENOUGH TO EVAPORATE THE MOISTURE IN THE SYSTEM (AT LEAST 48 HOURS). CHECK THE HUMIDITY WITHIN THE SYSTEM WITH A WET BULB INDICATOR, AND MAINTAIN THE VACUUM UNTIL THE WET BULB TEMPERATURE IS REDUCED TO -40° F. AFTER THE SYSTEM HAS BEEN EVACUATED AND DRIED, BREAK THE VACUUM BY CHARGING PROPER REFRIGERANT INTO THE SYSTEM.
D. INSULATION: ELASTOMERIC INSULATION WITH A MINIMUM THICKNESS OF 3/4" WITH A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS. THERMAL CONDUCTIVITY OF 0.27 AT 75°F MEAN (ASTM C177 OR C 518). INSULATION TO BE ARMSTRONG OR APPROVED EQUAL. ALL INSULATION IS TO BE COVERED BY SMOOTH FABRICATED Z-LOCK ALUMINUM JACKET 0.016" THICK WITH A FACTORY APPLIED 1 MIL POLYETHYLENE/40LB AND FAB STRAP. KRAFT MOISTURE BARRIER. CHILERS LOCK-ON OR APPROVED EQUAL.

SMOKE DETECTORS

A. ACCEPTABLE MANUFACTURERS: AUTOCALL, SIMPLEX, SIEMENS, NOTIFIER, GAMEWELL, PYROTRONICS.
B. THE UNIT SHALL CONSIST OF A CLEAR MOLDED PLASTIC ENCLOSURE (OR REMOTE MOUNTED LED STATUS INDICATOR SHALL BE PROVIDED NEXT TO THE SMOKE DETECTOR) WITH INTEGRAL CONDUIT KNOCKOUTS TO PROVIDE VISUAL VIEWING OF DETECTOR/SENSOR FOR MONITORING SENSOR OPERATION AND CHAMBER CONDITION. THE DUCT HOUSING SHALL BE PROVIDED WITH GASKET SEALS TO INSURE PROPER SEATING OF THE HOUSING TO THE ASSOCIATED DUCTWORK. EACH UNIT'S SAMPLING TUBES SHALL EXTEND THE WIDTH OF THE DUCT AND BE PROVIDED WITH POROSITY FILTERS TO REDUCE SENSOR/CHAMBER CONTAMINATION.
C. COMPLY WITH NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) SECTIONS NFPA 72, NFPA 90A, NFPA 101
D. TO MINIMIZE NUISANCE ALARMS, DETECTORS SHALL HAVE AN INSECT SCREEN AND BE DESIGN TO IGNORE INVISIBLE AIRBORNE PARTICLES OR SMOKE DENSITIES THAT ARE BELOW THE FACTORY SET ALARM POINT. NO RADIOACTIVE MATERIAL SHALL BE USED. THE DETECTOR HEAD SHALL BE DIRECTLY INTERCHANGEABLE WITH AN IONIZATION DETECTOR TYPE.
E. INSTALL AS PER MANUFACTURES RECOMMENDATIONS. PROVIDE ALL NECESSARY WIRING, POWER AND OTHER DEVICES FOR INSTALLATION. INTERLOCK THE SMOKE DETECTOR WITH THE RELATED AIR HANDLING EQUIPMENT TO PROVIDE AUTOMATIC SHUT-DOWN OF THE SYSTEM WHENEVER PRODUCTS OF COMBUSTION ARE DETECTED.

SINGLE PACKAGE 100% OUTSIDE AIR ROOFTOP AIR CONDITIONERS

A. PROVIDE AND INSTALL A SINGLE-PACKAGE, MULTIPLE-ZONE, VARIABLE VOLUME, ELECTRIC AIR CONDITIONER WITH FREE COOLING & REHEAT, DEHUMIDIFICATION & INDIRECT NATURAL GAS HEATING.
B. PERFORMANCE: AS SCHEDULED ON DRAWINGS, WITH HEAD PRESSURE CONTROL TO ENABLE UNIT START AND OPERATE DOWN TO 20 DEGREES FAHRENHEIT AMBIENT.
C. ACCEPTABLE MANUFACTURERS: DES CHAMPS, AAON, ADDISON
D. COMPRESSOR: PROVIDE A THERMALLY PROTECTED, SERVICEABLE SEMI-HERMETIC COMPRESSOR OR HERMETIC COMPRESSOR WITH SERVICE VALVES, VIBRATION ISOLATION, WARRANTY. CRANKCASE HEATERS, SLIGHT GLASS AND FILTER DRIER. PROVIDE WITH A 5-YEAR
E. EVAPORATOR AND CONDENSER COILS: PROVIDE COPPER TUBES WITH MECHANICALLY BONDED ALUMINUM FINS FOR EVAPORATOR AND CONDENSER COILS. PROVIDE HAIL GUARDS FOR CONDENSER COILS.
F. GAS HEATING SECTION: UNIT SHALL BE EQUIPPED WITH STAINLESS STEEL BURNERS AND HEAT EXCHANGERS. THE GAS CONTROLS SHALL HAVE AN AUTOMATIC GAS VALVE AND PRESSURE REGULATOR, MANUAL SHUTOFF VALVE, AND AN ELECTRIC SPARK PILOT IGNITION SYSTEM WITH ELECTRONIC FLAME DETECTION AND 100%%% SAFETY SHUTOFF.
G. HEAD PRESSURE CONTROL: PROVIDE SOLID STATE OUTDOOR AIR FAN SPEED CONTROL TO PERMIT UNIT TO OPERATE DOWN TO -20°F.
H. CONTROLS: CONTROLS SHALL BE FACTORY MOUNTED AND TESTED, DISCHARGE AIR CONTROLLER SHALL STAGE THE COOLING CAPACITY AS REQUIRED TO MAINTAIN DISCHARGE TEMPERATURE. DUCT MOUNTED STATIC PRESSURE SENSOR SHALL MODULATED THE VARIABLE INLET DAMPERS TO MAINTAIN REQUIRED SYSTEM STATIC PRESSURE.

AIR FILTERS

A. AIR FILTERS: FURNISH AND INSTALL A DISPOSAL MEDIA AND FRAME FILTER WITH RESISTANCE TO AIR FLOW OF A CLEAN FILTER NOT TO EXCEED 0.12" WG AT 300 FPM.
B. INSTALL THE FILTERS AND FILTER GAUGES IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

KITCHEN HOOD FIRE SUPPRESSION

A. PROVIDE AN AUTOMATIC FIRE SUPPRESSION SYSTEM USING A WET CHEMICAL AGENT FOR GREASE RELATED FIRES.
B. FURNISH ALL ARTICLES OF A COMPLETED SUPPRESION SYSTEM INCLUDING ALL MATERIALS, LABOR, TOOLS, EQUIPMENT, TRANSPORTATION SERVICES AND SUPERVISION FEES.
C. THE SYSTEM SHALL BE CAPABLE OF SUPPRESSING FIRES IN THE FOLLOWING AREAS ASSOCIATED WITH COOKING EQUIPMENT: VENTILATING EQUIPMENT INCLUDING HOODS, DUCTS, PLENUMS, AND FILTERS; FRYERS; GRIDDLES AND RANGE TOPS; UPRIGHT, NATURAL CHARCOAL, OR CHAIN-TYPE BROILERS; ELECTRIC, LAVA ROCK, MESQUITE OR GAS-RADIANT CHAR-BROILERS.
D. THE SYSTEM SHALL BE THE PRE-ENGINEERED TYPE HAVING MINIMUM AND MAXIMUM GUIDELINES ESTABLISHED BY THE MANUFACTURER, NFPA 96 AND LISTED BY UNDERWRITERS LABORATORIES, INC. (UL).
E. THE SYSTEM SHALL BE INSTALLED AND SERVICED BY PERSONNEL TRAINED BY THE MANUFACTURER.
F. THE SYSTEM SHALL BE CAPABLE OF PROTECTING COOKING APPLIANCES BY UTILIZING EITHER DEDICATED APPLIANCE PROTECTION AND/OR OVERLAPPING APPLIANCE PROTECTION.
G. THE SYSTEM SHALL BE MANUFACTURED BY ANSUL FIRE PROTECTION.
H. THE SYSTEM SHALL CONSIST OF A REGULATED RELEASE ASSEMBLY WHICH INCLUDES A REGULATED RELEASE MECHANISM AND A WET CHEMICAL STORAGE TANK(S) HOUSED WITHIN A SINGLE ENCLOSURE. NOZZLES, BLOW-OFF CAPS, DETECTORS, CARTRIDGES, AGENT, FUSIBLE FUSIBLE LINKS, AND PULLEY ELBOWS SHALL BE SUPPLIED AS NECESSARY IN THE QUANTITIES NEEDED FOR FIRE SUPPRESSION SYSTEM ARRANGEMENTS. ADDITIONAL EQUIPMENT SHALL INCLUDE REMOTE MANUAL PULL STATION, MECHANICAL AND ELECTRICAL GAS VALVES, PRESSURE SWITCHES, AND ELECTRICAL SWITCHES FOR AUTOMATIC EQUIPMENT AND GAS LINE SHUT-OFF SHALL BE PROVIDED AS NECESSARY TO MEET THE UL & CODE REQUIREMENTS.
I. THE FIRE SUPPRESSION SYSTEM SHALL BE DESIGNED, INSTALLED, INSPECTED, MAINTAINED, AND RECHARGED IN ACCORDANCE WITH THE MANUFACTURER'S LISTED INSTRUCTION.

AIR DEVICES

A. FURNISH AND INSTALL AIR DISTRIBUTION DEVICES, INCLUDING GRILLES, DIFFUSERS, REGISTERS, DAMPERS, AND EXTRACTORS.
B. ACCEPTABLE MANUFACTURERS: TUTTLE AND BAILEY, TITUS, KRUEGER, METAL-AIRE, NAILOR INDUSTRIES, PRICE.

DUCTWORK INSULATION

A. FURNISH AND INSTALL EXTERNAL INSULATION ON SUPPLY, RETURN, EXHAUST AND FRESH AIR DUCTWORK.
B. ALL DUCT INSULATION USED ON THE PROJECT INSIDE THE BUILDING MUST HAVE A FLAME SPREAD RATING NOT EXCEEDING 25 AND A SMOKE DEVELOPED RATING NOT EXCEEDING 50 AS DETERMINED BY TEST PROCEDURES ASTM E84, NFPA 255 AND UL 723.
C. CONDENSATION ON ANY INSULATED SYSTEM IS NOT APPROVED.
D. WHERE EXISTING INSULATED DUCTWORK OR OTHER SERVICES ARE TAPPED, REMOVE EXISTING INSULATION BACK TO UNDAMAGED SECTIONS AND REPLACE WITH NEW INSULATION OF THE SAME TYPE AND THICKNESS AS EXISTING INSULATION.
E. INSULATION: GLASS FIBER BLANKET DUCT INSULATION. ACCEPTABLE MANUFACTURERS ARE: MANVILLE R-SERIES MICROLITE FSKL, OWENS-CORNING ED100 RKF, KNAUF 1.0 PCF FSK.
F. FIREBOARD INSULATION: TOTALLY ENCAPSULATED WITH FOIL FACING, TWO HOUR RATED FIRE PROTECTION, ZERO CLEARANCE TO COMBUSTIBLE PROTECTION. ACCEPTABLE MANUFACTURERS ARE: PARTAK INSULATION, INC., PAROC FIREBOARD, THERMAL CERAMICS FIREMASTER 3M, PREIMER REFRACTORIES INTERNATIONAL, PYROSCAT.
G. REINFORCED FOIL TAPE: ACCEPTABLE MANUFACTURERS ARE: VENTURE 1525CW, 3" FSK.
H. KITCHEN GREASE EXHAUST DUCTWORK / KILN DUCTWORK / FUME HOOD DUCT: SECURE FIREBOARD INSULATION TO DUCT WITH IMPALING PINS AND 3" SQUARE SPEED CLIPS. IN ADDITION, PROVIDE A WIRE MESH SUPPORT SYSTEM AND ADDITIONAL SEALING OR SUPPORT AS REQUIRED BY THE CODE ENFORCING AUTHORITY. THE INSULATION SUPPORT SYSTEM SHALL INCLUDE FRAMED ACCESS TO ALLOW THE INSULATION TO BE REMOVED AND REPLACED WITHOUT DAMAGE AT THE ACCESS DOORS IN THE DUCT SYSTEM FOR INSPECTION AND CLEANING. COORDINATE LOCATION OF ACCESS OPENINGS TO CORRESPOND ACCURATELY. PROVIDE STAINLESS STEEL BANDING ON 12" CENTERS.

FANS

A. PROVIDE FAN TYPE, ARRANGEMENT, ROTATION, CAPACITY, SIZE, MOTOR HORSEPOWER, AND MOTOR VOLTAGE AS SHOWN. FAN CAPACITIES AND CHARACTERISTICS ARE SCHEDULED ON THE DRAWINGS. PROVIDE FANS CAPABLE OF ACCOMMODATING STATIC PRESSURE VARIATIONS OF +10 % OF SCHEDULED DESIGN AT THE DESIGN AIR FLOW.
B. ACCEPTABLE MANUFACTURERS: COOK, GREENHECK, PENN VENTILATOR, ACME, CARNES
C. SAFETY DISCONNECT SWITCH: PROVIDE A FACTORY-WIRED TO MOTOR, SAFETY DISCONNECT SWITCH ON EACH UNIT.
D. PREFABRICATED ROOF CURBS: FURNISH PREFABRICATED ROOF CURBS AS DETAILED. THE MINIMUM HEIGHT IS 14". INCLUDE A RESILIENT PAD ON EACH ROOF CURB SO THE EQUIPMENT CAN BE MOUNTED ON THE TOP FLANGE FOR PROPER SEAL. COORDINATE ROOF SLOPE AND CURB TO ENSURE EQUIPMENT IS INSTALLED IN LEVEL POSITION. PROVIDE DOUBLE SHELL TO PROTECT INSULATION FROM DAMAGE.
E. DAMPERS. WHERE AUTOMATIC BACKDRAFT DAMPER IS SCHEDULED: MULTI-BLADED, ROLL FORMED ALUMINUM BLADES, NYLON BEARINGS, NEOPRENE WEATHER STRIP ON BLADE EDGE.
F. FURNISH KITCHEN HOOD EXHAUST FANS WITH VENTED CURB EXTENSION THAT MEETS NFPA 96, CLEANOUT PORT, GREASE TAP, CURB SEAL, DRAIN CONNECTION AND HINGE KIT.
G. FURNISH SUPPLY FANS WITH 1" ALUMINUM, WASHABLE FILTER SECTION.
H. ROOFTOP VENTILATION AND EXHAUST SYSTEMS: PROVIDE EACH MOTOR WITH INTERNAL OVERLOAD PROTECTION, ALUMINUM, STAINLESS STEEL OR PLASTIC COATED BIRD GUARD, SCREWS AND FASTENERS OF STAINLESS STEEL OR NONFERROUS MATERIAL, ALL ALUMINUM CONSTRUCTION UNLESS INDICATED OTHERWISE ON FAN SCHEDULE, WELDED CONSTRUCTION, CORROSION RESISTANT FASTENERS, MINIMUM 16 GAUGE MARINE ALLOY ALUMINUM, ALUMINUM BASE SHALL BE CONTINUOUSLY WELDED CURB CAP CORNERS.

DUCTWORK

A. DUCT MATERIAL AND CONSTRUCTION: USE LOCK FORMING QUALITY PRIME GALVANIZED STEEL SHEETS OR COILS UP TO 60" WIDE. STENCIL EACH SHEET WITH GAUGE AND MANUFACTURER'S NAME. STENCIL COILS OF SHEET STEEL THROUGHOUT ON 10' CENTERS WITH GAUGE AND MANUFACTURER'S NAME. PROVIDE CERTIFICATION OF DUCT GAUGE AND MANUFACTURER FOR EACH SIZE DUCT.
B. RECTANGULAR LOW AND MEDIUM PRESSURE DUCT CONSTRUCTED OF SHEET METAL IN ACCORDANCE WITH THE LATEST EDITION OF SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
C. LOW PRESSURE ROUND DUCTS SHALL BE SHOP FABRICATED WITH SNAP LOCK LONGITUDINAL SEAMS. DUCTS SHALL BE CONSTRUCTED FOR A MINIMUM OF 2" W.G. STATIC PRESSURE. MEDIUM PRESSURE ROUND DUCTWORK SHALL BE WELDED SPIRAL SEAM SUCH AS MANUFACTURED BY UNITED SHEET METAL COMPANY. SEAMS AND JOINTS OF ALL MEDIUM PRESSURE DUCTWORK SHALL BE CONTINUOUSLY WELDED.
D. KITCHEN EXHAUST DUCT: WELDED BLACK STEEL, MINIMUM 16 GAUGE. SHOWER AREA EXHAUST SYSTEMS: WELDED 304 STAINLESS STEEL.
E. FLEXIBLE DUCT LOW PRESSURE SHALL BE A CONTINUOUS GALVANIZED SPRING STEEL WIRE HELIX, WITH REINFORCED METALIZED COVER, REINFORCED VAPOR BARRIER JACKET RATED FOR USE AT SYSTEM PRESSURE (6" WC MINIMUM). THERMAL CHARACTERISTICS OF R-8 BTU/HR/SQ. FT./°F AND 2" WALL THICKNESS INSULATION WITH 1" OVERLAP. ACCEPTABLE MANUFACTURERS: FLEXMASTER, HART & COOLEY,OMNIAIR.
F. FLEXIBLE DUCT MEDIUM PRESSURE SHALL BE CONSTRUCTED OF A HEAVY COATED FIBERGLASS CLOTH FABRIC SUPPORTED BY HELICAL WOUND GALVANIZED STEEL. THE INTERNAL WORKING PRESSURE RATING SHALL BE AT LEAST AS FOLLOWS WITH A BURSTING PRESSURE OF AT LEAST TWO TIMES THE WORKING PRESSURE: POSITIVE: 12" W.G., NEGATIVE: 5" W.G. THE DUCT SHALL BE RATED FOR A VELOCITY OF AT LEAST 5500 FPM. FACTORY INSULATE THE FLEXIBLE DUCT WITH FIBERGLASS INSULATION. THE R-VALUE SHALL BE AT LEAST R-8 AT A MEAN TEMPERATURE OF 75 DEGREES FAHRENHEIT. ACCEPTABLE MANUFACTURERS: FLEXMASTER, OMNIAIR.
G. DUCT LINING SHALL BE 1" THICK, 1 1/2 LB. DENSITY, FLEXIBLE LINING COATED ON THE AIR STREAM SIDE TO REDUCE ATTRITION. LINER SHALL BE SCHULER LINA-COUSTIC, CERTAIN TEED ULTRALITE, OR EQUAL MEETING REQUIREMENTS OF NFPA 90 A. PROVIDE I.A.Q. RATED LINER.
H. FIRE DAMPERS: FIRE DAMPERS FOR REQUIRED WALL RATINGS THAT ARE 95% MINIMUM FREE AREA. PROVIDE TYPE B OR TYPE C UL DAMPERS FOR LOW, MEDIUM AND HIGH-PRESSURE RECTANGULAR, SQUARE OR ROUND DUCTS. DAMPERS SHALL BE ACTIVATED BY A FUSIBLE LINK DESIGNED TO REACT AT 165°F. INSTALL PER MANUFACTURES RECOMMENDATIONS TO PROVIDE A UL ASSEMBLY. PROVIDE SEALED SLEEVE TO MEET DESIRED LEAKAGE PERFORMANCE.
I. WALL LOUVERS: REFER TO SCHEDULE ON DRAWINGS. COORDINATE WITH ARCHITECTURAL DRAWINGS. ALL LOUVER FRAMES SHALL BE A MINIMUM OF 0.08" EXTRUDED ALUMINUM. ALL BLADES SHALL BE A MINIMUM OF 0.081" EXTRUDED ALUMINUM. BEGINNING POINT OF WATER PENETRATION AT 0.01 OZ/SQ.FT. SHALL BE A MINIMUM OF 800 FT/MIN. PROVIDE ALL LOUVERS WITH REMOVABLE ALUMINUM BIRD SCREEN WITH 1/4" MESH.
J. VOLUME DAMPERS: MANUAL BALANCING DAMPERS THAT MEET OR EXCEED THE FOLLOWING MINIMUM CONSTRUCTION STANDARDS: FRAME 16-GAUGE, BLADES 16-GAUGE, BEARINGS CORROSION RESISTANT, OPPOSED BLADE DAMPERS.
K. INSTALLATION: USE CONSTRUCTION METHODS AND REQUIREMENTS AS OUTLINED IN SMACNA HVAC DUCT CONSTRUCTION STANDARDS AS WELL AS SMACNA BALANCING AND ADJUSTING PUBLICATIONS, UNLESS INDICATED OTHERWISE IN THE SPECIFICATIONS. REFER TO DETAILS ON THE DRAWINGS FOR ADDITIONAL INFORMATION. REINFORCE DUCTS IN ACCORDANCE WITH RECOMMENDED CONSTRUCTION PRACTICE OF SMACNA. PROVIDE ADDITIONAL REINFORCEMENT OF LARGE PLENUMS AS REQUIRED TO PREVENT EXCESSIVE FLEXING AND OR VIBRATION.

GENERAL

A. PERFORM WORK IN ACCORDANCE WITH APPLICABLE STATUTES, ORDINANCES, CODES AND REGULATIONS OF GOVERNMENTAL AUTHORITIES HAVING JURISDICTION.
B. OBTAIN ALL PERMITS REQUIRED.
C. CONTRACT DRAWINGS ARE DIAGRAMMATIC ONLY AND DO NOT GIVE FULLY DIMENSIONED LOCATIONS OF VARIOUS ELEMENTS OF WORK. DETERMINE EXACT LOCATIONS FROM FIELD MEASUREMENTS.
D. GUARANTEE WORK FOR 1 YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION OF THE PROJECT. DURING THAT PERIOD MAKE GOOD ANY FAULTS OR IMPERFECTIONS THAT MAY ARISE DUE TO DEFECTS OR OMISSIONS IN MATERIAL, EQUIPMENT OR WORKMANSHIP. AT THE OWNER'S OPTION, REPLACEMENT OF FAILED PARTS OR EQUIPMENT SHALL BE PROVIDED.
E. IMMEDIATELY PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT, REPLACE AIR FILTERS.
F. PROVIDE EQUIPMENT HOUSEKEEPING PADS UNDER ALL FLOOR MOUNTED AND GROUND MOUNTED HVAC EQUIPMENT, AND AS SHOWN ON THE DRAWINGS. CONCRETE PADS ARE TO BE 4" THICK UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
G. PROVIDE NAMEPLATES WITH 1/2" HIGH LETTERS AND FASTENED WITH EPOXY OR SCREWS.
H. MAINTAIN QUALITY CONTROL OVER SUPERVISION, SUBCONTRACTORS, SUPPLIERS, MANUFACTURERS, PRODUCTS, SERVICES, SITE CONDITIONS AND WORKMANSHIP TO PRODUCE WORK IN ACCORDANCE WITH CONTRACT DOCUMENTS.
I. COMPLY WITH INDUSTRY STANDARDS EXCEPT WHEN MORE RESTRICTIVE TOLERANCES OR SPECIFIED REQUIREMENTS INDICATE MORE RIGID STANDARDS OR MORE PRECISE WORKMANSHIP.
J. PERFORM WORK BY PERSONS QUALIFIED TO PRODUCE WORKMANSHIP OF SPECIFIED QUALITY.
K. SECURE PRODUCTS IN PLACE WITH POSITIVE ANCHORAGE DEVICES DESIGNED AND SIZED TO WITHSTAND STRESSES, VIBRATION, AND RACKING. UNDER NO CONDITIONS SHALL MATERIAL OR EQUIPMENT BE SUSPENDED FROM STRUCTURAL BRIDGING.
L. PROVIDE FINISHES TO MATCH APPROVED SAMPLES. ALL EXPOSED FINISHES SHALL BE APPROVED BY THE ARCHITECT. SUBMIT COLOR SAMPLES AS REQUIRED.
M. COMPLY WITH INSTRUCTIONS IN FULL DETAIL, INCLUDING EACH STEP IN SEQUENCE. SHOULD INSTRUCTION CONFLICT WITH CONTRACT DOCUMENTS, REQUEST CLARIFICATION FROM ARCHITECT / ENGINEER BEFORE PROCEEDING.

MECHANICAL ALTERATIONS

A. INSPECT AND SERVICE EXISTING EQUIPMENT AND MATERIALS THAT ARE TO REMAIN OR TO BE REUSED.
B. DISPOSAL OF EQUIPMENT, MATERIALS, OR HOUSEKEEPING PADS TO BE ABANDONED. PRIOR TO DISPOSAL, THE CONTRACTOR SHALL VERIFY WITH THE OWNER WHAT IS TO BE SALVAGED BY THE OWNER AND WHAT IS TO BECOME THE PROPERTY OF THE CONTRACTOR.
C. HANDLING OF EQUIPMENT AND MATERIALS TO BE REMOVED.
D. INSPECTION: EXISTING MATERIALS AND EQUIPMENT INDICATED ON THE DRAWINGS OR IN THE SPECIFICATIONS TO BE REUSED SHALL BE INSPECTED FOR DAMAGED OR MISSING PARTS. CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER, IN WRITING, ACCORDINGLY. IF USING MATERIALS SPECIFIED OR SHOWN ON THE DRAWING VOIDS OR DIMINISHES THE WARRANTY OR OPERATION OF REMAINING EQUIPMENT OR SYSTEMS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER, IN WRITING. DEMOLITION DRAWINGS ARE BASED ON CASUAL FIELD OBSERVATION, AND WHEN AVAILABLE, EXISTING RECORD DOCUMENTS. REPORT DISCREPANCIES TO ARCHITECT BEFORE DISTURBING EXISTING INSTALLATION, AND IMMEDIATELY AFTER SUCH DISCREPANCIES ARE DISCOVERED.
E. APPLICATION: EXISTING MATERIALS AND EQUIPMENT INDICATED ON THE DRAWINGS OR IN THE SPECIFICATIONS TO BE REUSED SHALL BE CLEANED AND RECONDITIONED, INCLUDING CLEANING OF PIPING SYSTEMS AND HVAC COILS PRIOR TO INSTALLATION AND REUSE. MATERIAL AND EQUIPMENT REMOVED THAT IS NOT TO BE SALVAGED FOR OWNER'S USE OR FOR REUSE ON THE PROJECT SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND BE REMOVED FROM THE SITE. MATERIAL OR EQUIPMENT SALVAGED FOR OWNER'S USE SHALL BE CAREFULLY HANDLED AND STORED WHERE DIRECTED BY THE OWNER OR THE ARCHITECT / ENGINEER. RELOCATE MATERIAL AND / OR EQUIPMENT AS DIRECTED BY OWNER. MATERIALS AND EQUIPMENT NOT INDICATED TO BE REMOVED OR ABANDONED SHALL BE RECONNECTED TO THE NEW SYSTEM. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL WALK AREAS TO BE RENOVATED WITH OWNER TO IDENTIFY AND DOCUMENT ITEMS TO BE SALVAGED FOR OWNER'S USE.
F. SEQUENCE AND SCHEDULE: COORDINATE UTILITY SERVICE OUTAGES WITH UTILITY COMPANY, ARCHITECT AND OWNER. REMOVE CONCRETE HOUSEKEEPING PAD WHERE MATERIALS OR EQUIPMENT HAVE BEEN REMOVED.

CONDENSATE PIPING

A. TYPE "L" COPPER WITH DRAINAGE PATTERN FITTINGS IN RETURN PLENUM AREAS AND ON ROOF, PVC WITH DRAINAGE PATTERN FITTINGS IN NON-PLENUM AREAS.
B. INSTALL THE SYSTEM TO FACILITATE EASY REMOVAL, USE THREADED PLUGGED TEE AT EACH CHANGE OF DIRECTION TO PERMIT CLEANING, INSTALL A CLEANOUT EVERY 50 FEET OF STRAIGHT RUN PIPING, MAINTAIN A POSITIVE SLOPE ON ALL PIPING.
C. INSTALL A WATER SEAL TRAP LEG BASED ON THE FAN PRESSURE. SIZE THE LENGTH OF THE TRAP LEG 1 INCH LARGER THAN THE ACTUAL SYSTEM PRESSURE.
D. DO NOT INSTALL PIPING SIZED SMALLER THAN THE UNIT DRAIN CONNECTION SIZE.
E. INSULATE PIPING WITH 3/4" ELASTOMERIC INSULATION FOR ALL PIPE BELOW ROOF. INSULATION TO BE 25/50 FLAME AND SMOKE RATING.

KITCHEN HOOD

A. PROVIDE AN EXHAUST HOOD AS SHOWN ON THE PLANS AND SCHEDULE. THE KITCHEN VENTILATION HOOD(S) SHALL BE OF THE TYPE I, EXHAUST ONLY CANOPY SUITABLE FOR ALL TYPES OF COOKING APPLICATIONS. THE HOOD(S) SHALL BE U. L. LISTED FOR 400°F, 600°F, OR 700°F RATED COOKING APPLIANCES. MAKE-UP SHALL BE INDEPENDENTLY PROVIDED.
B. THE HOOD(S) EXTERIOR SHALL BE CONSTRUCTED OF A MINIMUM OF 18 GA STAINLESS STEEL WITH A POLISHED FINISH WHERE EXPOSED. THE HOOD(S) SHALL BE CONSTRUCTED USING THE STANDING SEAM METHOD FOR OPTIMUM STRENGTH. FRONT PANELS SHALL BE OF SINGLE WALL CONSTRUCTION. ALL SEAMS, JOINTS AND PENETRATIONS OF THE HOOD ENCLOSURE SHALL BE WELDED AND/OR LIQUID TIGHT. LIGHTER MATERIAL GAUGES, ALTERNATE MATERIAL TYPES AND FINISHES ARE NOT ACCEPTABLE. ALL UNEXPOSED INTERIOR SURFACES SHALL B CONSTRUCTED OF A MINIMUM 18 GA CORROSION RESISTANT STEEL INCLUDING, BUT NOT LIMITED TO DUCTS, PLENUM, AND BRACKETS.
C. THE HOOD(S) SHALL INCLUDE A FILTER HOUSING CONSTRUCTED OF THE SAME MATERIAL AS THE HOOD. THE FILTERS SHALL BE ALUMINUM BAFFLE TYPE, U. L. 1046 CLASSIFIED, AND IN SUFFICIENT NUMBER AND SIZES TO ENSURE OPTIMUM PERFORMANCE AS SPECIFIED BY THE FILTER MANUFACTURER. THE FILTER HOUSING SHALL TERMINATE IN A PITCHED, FULL LENGTH GREASE TROUGH WHICH SHALL DRAIN INTO A REMOVABLE GREASE CONTAINER.
D. VAPORPROOF, U. L. LISTED INCANDESCENT LIGHT FIXTURES SHALL BE PREWIRED TO A JUNCTION BOX SITUATED AT THE TOP OF THE HOOD FOR FIELD CONNECTION. WIRING SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC #70 - LATEST EDITION).
E. THE HOODS SHALL BE BUILT IN ACCORDANCE WITH NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) BULLETIN #96, INTERNATIONAL MECHANICAL CODE (IMC), INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO), BUILDING OFFICIALS AND CODE ADMINISTRATORS (BOCA), SOUTHERN BUILDING CODE CONGRESS INTERNATIONAL (SBCCI), AND BEAR THE NATIONAL SANITATION FOUNDATION (NSF) SEAL OF APPROVAL. THE HOOD MANUFACTURER SHALL PROVIDE, ON REQUEST, THE NECESSARY DATA THAT CONFIRMS COMPLIANCE WITH THE CODE AUTHORITIES LISTED ABOVE.
F. THE HOOD(S) SHALL BE CONSTRUCTED BY GREENHECK OR CAPTIVE AIRE.
G. THE HOOD MANUFACTURER SHALL DICTATE THE CFM OF THE HOOD AS REQUIRED TO MEET THE HOOD'S UL REQUIREMENTS.

AGP
the Abla Griffin Partnership L.L.C.
313 S. E. 5th Street
MOORE, OK. 73160
405.735.3477
AGP@theAGP.net
www.theAGP.net

CEDAR CREEK
CIVIL

KFC ENGINEERING
STRUCTURAL

SALAS O'BRIEN
MECHANICAL / ELECTRICAL

PROFESSIONAL ENGINEER — Dwayne McDonald Gordon — 30822 — 07/01/26

KF
drawn by

DG
checked by

APRIL 2026
date

REVISIONS

Δ	DESCRIPTION	DATE

MOORE PUBLIC SCHOOLS

SOUTHGATE ELEMENTARY KITCHEN UPGRADES and ADDITION

sheet no:

M701

Salas O'Brien
Salas O'Brien, Inc. - Oklahoma City
2900 S. Telephone Road, Suite 120
Moore, OK 73160
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