HYAC SUBCONTRACTOR SHALL PROVIDE AT BID TIME A BID TO PROVIDE PREVENTATIVE MAINTENANCE SERVICES FOR ONE YEAR.

RURNISH TO THE OWNER ALL OPERATING 4 MAINTENANCE MANUALS, RECORD DRAWINGS, TEST 4 BALANCE REPORT. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER REPRESENTATIVES FOR EMPLOYEE TRAINING REQUIRED/EMPS FOR ALL EQUIPMENT.

MECHANICAL CONTRACTOR SHALL SUBMIT COMPLIANCE CHECKLIST TO BUILDING OFFICIAL UPON SUBSTANTIAL

ROYIDE EQUIPMENT INDICATED ON THE DRAWINGS, AND AS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM.

FURNISH MEANS TO SUPPLY AND DELIVER TO PROJECT SITE, READY FOR INSTALLATION INSTALL MEANS TO PLACE IN POSITION AND MAKE CONNECTIONS FOR SERVICE OR USE PROVIDE MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE.

PROVIDE LABOR AND MATERIALS TO REPAIR OR REPLACE DEFECTIVE PARTS AND MATERIALS AS REQUIRED FOR ONE YEAR AFTER SUBSTANTIAL COMPLETION OR OWNER ACCEPTANCE OF THE COMPLETED PROJECT. PROVIDE A SEPARATE LINE ITEM DEDUCT AMOUNT ON THE PROPOSAL FORM TO DELETE WARRANTY SERVICE, AT THE CUNER'S OPTION. CONTRACTOR SHALL INCLUDE ONE YEAR WARRANTY ON OWNER RURNISHED SEMIPHENT. CONTRACTOR SHALL INCLUDE COSTS FOR RECEIVING, HANDLING, STORAGE, AND HOISTING OF OWNER FURNISHED

PROVIDE OPERATION MANUALS, MAINTENANCE MANUALS AND SCHEMATICS FOR ALL MECHANICAL EQUIPMENT INSTALLED.

COORDINATE WITH THE WORK OF OTHER SECTIONS, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE.

UNLESS OTHERWISE NOTED, DUCT DIMENSIONS ON THE DRAWINGS ARE INSIDE CLEAR DIMENSIONS.

## TEMPERATURE CONTROLS

PROVIDE PROGRAPHABLE THERMOSTATS WITH REMOTE TEMPERATURE SENSORS AND REMOTE HUMIDISTATS COMPATIBLE WITH ROOFTOP WITH CONTROL WIRING SHALL BE INSTALLED IN COMDUIT. THERMOST SHALL MEET SETPOINT ADJUSTMENT FOR WINCCLIPIED WODE: HEATING POWN TO 55 DEGREES AND ROOFTOP WITS SDEGREES. PROVIDE INTERLOCK CONTROL WIRING BETWEEN HOOD EXHAUST FANS AND ROOFTOP WITS.

END OF SECTION

SECTION 23/0593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

## PART | - GENERAL

- I.I SECTION REQUIREMENTS
- A. SUBMITTALS
- I. CERTIFIED TAB REPORTS.
- B. TAB FIRM QUALIFICATIONS: AABC NEBB OR TABB CERTIFIED
- C. TAB REPORT FORMS: STANDARD TAB CONTRACTOR'S FORMS APPROVED BY ARCHITECT.
- D. PERFORM TAB AFTER LEAKAGE AND PRESSURE TESTS ON AIR DISTRIBUTION SYSTEMS HAVE BEEN SATISFACTORILY COMPLETED.
- PART 2 PRODUCTS (NOT USED)

# PART 3 - EXECUTION

- 3.1 EXAMINATION
- A EXAMINE THE CONTRACT DOCUMENTS TO BECOME FAMILIAR WITH PROJECT REQUIREMENTS AND TO DISCOVER CONDITIONS IN SYSTEMS DESIGNS THAT MAY PRECLUDE PROPER TAB OF SYSTEMS AND EQUIPMENT.
- B. EXAMINE THE APPROVED SUBMITTALS FOR HVAC SYSTEMS AND EQUIPMENT
- C. EXAMINE SYSTEMS FOR INSTALLED BALANCING DEVICES, SUCH AS TEST FORTS, GAGE COCKS, THERMOMETER WELLS, FLOU-COMTROL DEVICES, BALANCING VALVES AND FITTINGS, AND MANUAL VOLUME DAMPERS. VERITY THAT LOCATIONS OF THESE BALANCING DEVICES ARE ACCESSIBLE.
- D. EXAMINE SYSTEM AND EQUIPMENT INSTALLATIONS AND VERIFY THAT FIELD QUALITY-CONTROL TESTING, CLEANING, AND ADJUSTING SPECIFIED IN INDIVIDUAL SECTIONS HAVE BEEN PERFORMED.
- E. EXAMINE HYAC EQUIPMENT AND FILTERS AND VERIFY THAT BEARINGS ARE GREASED, BELTS ARE ALIGNED AND TIGHT, AND EQUIPMENT WITH FUNCTIONING CONTROLS IS READY FOR OPERATION.
- F. EXAMINE TERMINAL UNITS, SUCH AS VARIABLE-AIR-VOLUME BOXES, AND VERIFY THAT THEY ARE ACCESSIBLE AND THEIR CONTROLS ARE CONNECTED AND FUNCTIONING.
- G. EXAMINE AUTOMATIC TEMPERATURE SYSTEM COMPONENTS TO VERIFY THE FOLLOWING:
- 1. DAMPERS, VALVES, AND OTHER CONTROLLED DEVICES ARE OPERATED BY THE INTENDED
- 2. DAMPERS AND VALVES ARE IN THE POSITION INDICATED BY THE CONTROLLER.
- INTEGRITY OF DAMFERS AND VALVES FOR FREE AND FULL OPERATION AND FOR TIGHTNESS OF FULLY CLOSED AND FULLY OPEN POSITIONS. THIS INCLUDES DAMPERS IN MULTIZONE UNITS, MIXING BOXES, AND VARIABLE-AIR-VOLUME TERMINALS.
- 4. AUTOMATIC MODULATING AND SHUTOFF VALVES, INCLUDING TWO-WAY VALVES AND THREE-WAY MIXING AND DIVERTING VALVES, ARE PROPERLY CONNECTED.
- 5. THERMOSTATS AND HUMIDISTATS ARE LOCATED TO AVOID ADVERSE EFFECTS OF SUNLIGHT, DR
- 6. SENSORS ARE LOCATED TO SENSE ONLY THE INTENDED CONDITIONS.
- 1. SEQUENCE OF OPERATION FOR CONTROL MODES IS ACCORDING TO THE COM
- 8. CONTROLLER SET POINTS ARE SET AT INDICATED VALUES.
- 9. INTERLOCKED SYSTEMS ARE OPERATING.
- 10. CHANGEOVER FROM HEATING TO COOLING MODE OCCURS ACCORDING TO INDICATE
- AND BALANCE H. REPORT DEFICIENCIES DISCOVERED BEFORE AND DURING PERMANCE OF TE PROCEDURES.
- 32 GENERAL PROCEDURES FOR TESTING AND BALANCING
- A PERFORM TESTING AND BALANCING ROCEDURES CONTAINED IN AABC'S "NATIONAL MADARDS FOR ACCORDING TO THE PROCEDURES M BALANCE", ASHRAE III, NEBB'S OF ENVIRONMENTAL SYSTEMS" OF "PROCEDURAL STANDARDS FOR TESTING SMACNA'S "HVAC SYSTEMS - TESTING, AT
- B. CUT INSULATION, DUCTS, PIPES, AND E ALLATION OF TEST PROBES TO THE TESTING AND BALANCING, PATCH PROBE TO CONSTRUCT DUCTS. INSTALL AND JOIN HOLES IN DUCTS WITH SAME.
- DING DAMPER-CONTROL POSITIONS, VALVE POSITION
- NCING AIR SYSTEMS
- GRAMS OF SYSTEMS! "AS-BUILT" DUCT LAYOUTS
- ME SYSTEMS, DEVELOP A PLAN TO SIMULATE DIVERSITY

- C. DETERMINE THE BEST LOCATIONS IN MAIN AND BRANCH DUCTS FOR ACCURATE DUCT AIRSLOU MEASUREMENTS.
- D. YERIFY THAT MOTOR STARTERS ARE EQUIPPED WITH PROPERLY SIZED THERMAL PROTECTION.
- E. CHECK FOR AIRFLOW BLOCKAGES.
- F. CHECK CONDENSATE DRAINS FOR PROPER CONNECTIONS AND FUNCTIONING.
- G. CHECK FOR PROPER SEALING OF AIR-HANDLING UNIT COMPONENTS

2. AIR OUTLETS AND INLETS: PLUS OR MINUS IØ PERCENT.

- H. CHECK FOR PROPER SEALING OF AIR DUCT SYSTEM.
- 3.4 TOLERANCES A. SET HYAC SYSTEM AIRFLOW AND WATER FLOW RATES WITHIN THE FOLLOWING TOLERANCES
- 1. SUPPLY, RETURN, AND EXHAUST FANS AND EQUIPMENT WITH FANS: PLUS OR MINUS 10 PERCEN
- END OF SECTION 23/05/93

## SECTION 230700 - HVAC INSULATION

- 2.1 PERFORMANCE REQUIREMENTS
- A. SURFACE-BURNING CHARACTERISTICS:
- INDOOR INSULATION AND RELATED MATERIALS: TO BE FACTORY LABELED DESIGNATING MAXIMUM FLAME-SPREAD INDEX OF 25 OR LESS, AND SMOKE-DEVELOPED INDEX OF 50 OR LESS ACCORDING TO ASTME 84
- 22 INSULATION MATERIALS
- A. FLEXIBLE ELASTOMERIC: CLOSED-CELL, SPONGE- OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C 534, TYPE | FOR TUBULAR MATERIALS AND TYPE || FOR SHEET MATERIALS.
- B. MINERAL-FIBER BLANKET INSULATION: COMPLY WITH ASTM C 553, TYPE II AND ASTM C 1290, TYPE I.
- FSK JACKET: ALIMINIM-FOIL, FIBERGLASS-REINFORCED SCRIM WITH KRAFT-PAPER BACKING: COMPLYING WITH ASTMC IBS6, TYPE II.
- F6K TAPE: F0IL-FACE, VAPOR-RETARDER TAPE MATCHING FACTORY-APPLIED JACKET WITH ACRYLIC ADHE6IVE1 COMPLYING WITH ASTMC 1136.
- C. MINERAL-FIBER PIPE AND TANK INSULATION: COMPLYING WITH ASTM C1933, TYPE!! OR TYPE!!!A CATEGORY 2, OR WITH PROPERTIES SIMILAR TO ASTM C 6/2, TYPE! B1 AND HAVING FACTORY-APPLIED ASJ JACKET. NOMINAL DENSITY IS 25 LB/CLJ FT. OR MORE. THERMAL CONDUCTIVITY (K-VALUE) AT 100 DEGF 16 028 BTU X INJH X 50, FT. X DEGF OR LESS.
- ASJ. WHITE, KRAFT-PAPER, FIBERGLASS-REINFORCED SCRIM WITH ALUMINUM-FOIL BACKING: COMPLYING WITH ASTM C 1136, TYPE I.
- ASJ TAPE: WHITE VAPOR-RETARDER TAPE MATCHING FACTORY-APPLIED JACKET WITH ACRYLIC ADHESIVE, COMPLYING WITH ASTMC 1136.
- D. FLEXIBLE ELASTOMERIC ADHESIVE: COMPLY WITH MIL-A-24179A, TYPE II, CLASS I.
- E. MINERAL-FIBER ADHESIVE: COMPLY WITH MIL-A-3316C, CLASS 2, GRADE A.
- F. YAPOR-BARRIER MASTIC: WATER BASED! SUITABLE FOR INDOOR AND OUTDOOR USE ON BELOW AMBIENT SERVICES! COMPLY WITH MIL-PRF-19565C, TYPE II.
- PART 3 EXECUTION
- 3.1 INSULATION INSTALLATION A COMPLY WITH REQUIREMENTS OF THE MIDWEST INSULATION CONTRACTORS ASSOCIATION'S "NATION COMMERCIAL & INDUSTRIAL INSULATION STANDARDS" FOR INSULATION INSTALLATION ON PIPES
- B. INSULATION INSTALLATION AT INTERIOR WALL AND PARTITION PENETRATIONS (THAT ARE NOTFIRE FINSTALL INSULATION CONTINUOUSLY THROUGH WALLS AND PARTITIONS.
- INSULATION INSTALLATION AT FIRE-RATED WALL, PARTITION, AND FLOOR INSULATION CONTINUOUSLY THROUGH PENETRATIONS. SEAL PENETRATIONS.
- D. FLEXIBLE ELASTOMERIC INSULATION INSTALLATION:
- SEAL LONGITUDINAL SEAMS AND END JOINTS WITH ADHESIVE TO ELIMINATE OF THAT ALLOW PASSAGE OF AIR TO SURFACE BEING INSULATED.
- STALL MITERED SECTIONS
  1 ADHESIVE TO ELIMINATE 2. INSULATION INSTALLATION ON PIPE FITTINGS INSULATION. SECURE INSULATION MATERIALS IN INSULATION THAT ALLOW PASSAGE OF AIR
- E. MINERAL-FIBER INSULATION INSTALLATION:
- . INSULATION INSTALLATION ON STRAIGHT SEAL LONGITUDINAL SEAMS, END JOIN
- IRFACES, SECURE LAPS WITH OUTWARD CLINCHED STAPLES AT 6 INCH
- 3. FOR INSULATION WITH ACCOUNT APPLIED JAKE LONGITUDINAL TABS BUT SECURE TABS WITH ADD MATERIAL MANUFACTURE AND SEAL WITH VAPOR IT SURFACES, DO NOT STAPLE AS RECOMMENDED BY INSULATION TO AND FLASHING SEALANT.
- ON DUCTS AND PLENUMS: SECURE WITH ADHESIVE AND INSULATION
- BURFACE TEMPERATURES BELOW AMBIENT, INSTALL A CONTINUOUS
- IRING INSULATION
- PLY AIR
- LED AND EXPOSED OUTDOOR AIR.
- EALED AND EXPOSED RETURN AIR LOCATED IN NONCONDITIONED SPACE.
- ACT AND PLENUM INSULATION SCHEDULE
- RÉTAIN "ONE OF" OPTION IN PARAGRAPHS IN THIS ARTICLE TO ALLOW CONTRACTOR TO SELECT PIPING MATERIALS FROM THOSE RETAINED.
- A. CONCEALED DUCT INSULATION SHALL BE 1-1/2" THICK MINERAL-FIBER BLANKET WITH A 15-LB/CU. FT.
- 3.3 HVAC PIPING INSULATION SCHEDULE
- A. CONDENSATE PIPING: INSULATION SHALL BE I" THICK FLEXIBLE ELASTOMERIC
- B. REFRIGERANT PIPING: INSULATION SHALL BE I" THICK FLEXIBLE ELASTOMERIC.
- END OF SECTION 230700

## SECTION 232300 - REFRIGERANT PIPING

# PART 2 - PRODUCTS

- 2.1 TUBES AND FITTINGS
  - COPPER TUBE: A\$IM B &\$, TYPEK OR TYPEL, ANNEALED OR DRAWN-TEMPER TUBING AND WROUGHT-COPPER FITTING\$ WITH BRAZED OR \$OLDERED JOINTS.
- B. WROUGHT-COPPER FITTINGS AND UNIONS: ASME BIG.22.
- C. SOLDER FILLER METALS: ASTM B 32. USE 95-5 TIN ANTIMONY OR ALLOY HB SOLDER TO JOIN COPPER SOCKET FITTINGS ON COPPER PIPE.

- D. BRAZING FILLER METALS: AUS A5.8
- 22 VALVES AND SPECIALTIES
- A. AS REQUIRED BY THE KITCHEN EQUIPMENT MANUFACTURER.

## PART 3 - EXECUTION

- 31 INSTALLATION
- A. INSTALL REFRIGERANT PIPING AND CHARGE WITH REFRIGERANT ACCORDING TO ASHRAE IS.
- B. INSTALL REFRIGERANT PIPING AS REQUIRED BY THE KITCHEN EQUIPMENT MANUFACTURER

## SECTION 233100 - HVAC DUCTS AND CASINGS

## PART 2 - PRODUCTS

- 2.I PERFORMANCE REQUIREMENTS
- A. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE."
- B. STRUCTURAL PERFORMANCE: DUCT HANGERS AND SUPPORTS SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND WINDER CONDITIONS DESCRIBED IN SMACNA'S "HYAC DUCT CONSTRUCTION STANDARDS HETAL AND FLEXIBLE."
- C. COMPLY WITH NFPA 96 FOR DUCTS CONNECTED TO COMMERCIAL KITCHEN HOODS.
- 22 DUCTS
- A GALVANIZED-STEEL SHEET: ASTM A 653/A 653M AND A 924 WITH G90 HOT-DIP GALVANIZED COATING
- 1 GALVANIZED COATING DESIGNATION: G9Ø
- FINISHES FOR SURFACES EXPOSED TO VIEW: MILL PHOSPHATIZED, DUCTUORK SHALL BE CLEANED DEBRIS AND OIL, THEN WIFED DOWN WITH VINEGAR OR OTHER SURFACE PREPARING CHEMICAL PREPARE DUCT FOR PAINT.
- B. TYPE I KITCHEN EXHAUST DUCTWORK
- 1. FIELD FABRICATED RECTANGULAR KITCHEN GREASE DUCT:
- MINIMUM 16 GALGE CARBON STEEL WHERE CONCEALED, AND OF MINIMUM 16
   WHERE EXPOSED, JOINTS AND SEAMS SHALL BE CONTINUOUSLY WELDED
   EXTERNAL SIDE OF THE DUCT SYSTEM. STAINLESS ST
- PROVIDE GREASE RESERVOIR AS REQUIRED BY THE PROVIDE GREASE REQUIRED BY THE REQUIREMENTS.
- c. COMPOSITE GREASE DUCT ENCLOSURE ASSEMBLIES:
- 40 SEA DYNELY WIT UIL BIA PROVIDE POLITIERIC RUBBERT THE SEALANT INFOR LOCAL OF JULTILIORS AND DUCTURES EXPREED TO OUTDOOR CONDITIONS. HE BONDING SENGTH FOR SURE, FIRST TIME SEALING OF JOINTS IN LOW MEDIUM, IT SYSTEMS SES LER SHALL BE HIGH IN SOLID CONTINT, PROVIDE A TUD PART CONSISTING OF WOVEN FIBER TARE IMPREDATED WITH A GYPEUM MINERAL FIBED ACRTICOSILICOSIL CONTINUED THAT REACTS EXCHIENTICALLY WITH THE SEALING SYSTEM MUST BE RATED FOR BOTH INDOOR AND OUTDOOR APPLICATION
- ION, COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS METAL AND
- ACCESS.
- VOLUME DAMPERS AND CONTROL DAMPERS; SINGLE-BLADE AND MULTIPLE OPPOSED-BLADE DAMPERS, STANDARD LEAKAGE RATINS, AND SUITABLE FOR HORIZONTAL OR VERTICAL APPLICATIONS: FACTORY FABRICATED AND COMPLETE WITH REGUINED HAPDLANE AND ACCESSORIES.
- ROUND VOLUME DAMPERS: PROVIDE MINIMUM 20 GAUGE GALVANIZED STEEL FRAME AND BLADES, MINIMUM 3/0° SQUARES STEEL AXLE, MOLDED SYNTHETIC BEARNAS, WITH LOCKING POSITION REGULLATOR. REGULLATOR SHALL BE POSITIONED WITH SHEET HETAL BRACKET BEYOND DUCT COVERNIG WHERE POSITIONING REGULLATOR IS NOT ACCESSIBLE, PROVIDE COUPLING AND EXTENSION ROD WITH EGULATOR FOR CEILING OR WALL INSTALLATION, AS REQUIRED
- RECTANGULAR VOLUME DAMPERS: PROVIDE MINIMUM IS GAUGE GALVANIZED STEEL CHANNEL FRAME, IS GAUGE GALVANIZED STEEL BLADES, MINIMUM IX MEXAGONAL AXLE, BOLDED SYNTHETIC BEARNAS, WITH 3/8" SCALARS FLATED STEEL CONTROL SHAFT. LINKAGES SHALL BE CONCEALED IN THE FRAME. OPERATING SHAFT SHALL EXTEND BEYOND FRAME AND DUCT TO A LOCKING GUADRANT WITH ADJUSTABLE LEVER MAXIMUM BLADE WIDTH SHALL NOT EXCEED 6".
- . FLEXIBLE DUCT CONNECTORS: FLAME-RETARDED OR NONCOMBUSTIBLE FABRICS, COATINGS, AND ADHESIVES COMPLYING WITH UL 181, CLASS I. CONNECTOR TO BE 30 OUNCE, NEOPRENE COATED,
- C. FLEXIBLE DUCTS: FACTORY ASSEMBLED, UL 181, CLASS I, WITH 1-1/2-INCH THICK (R-5 MIN.), I PCF FIBERGLASS NSULATION AND REINFORCED OUTER PROTECTIVE COVERVAPOR BARRIER FLEXIBLE DUCT SHALL MEN THE ASSEMBLE THE SPREAD WIDER 58, SHOKE DEVELOPED WIDER 58, AND SHALL BE RAITED FOR MINIMUM 2-INCH WAS PRESSURE AND Ø TO 250°F TEMPERATURE. PROVIDE SCREW-OPERATED METAL ADJUSTABLE CLAMPING DEVICES, USE TIMST-LOCK CONICAL TAP COLLARS AT CONNECTIONS INTO SHEET METAL DUCTUORK MAXMUM EXTENDED LENGTH OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FEET.
- D. TURNING VANES; PROVIDE FABRICATED TURNING VANES AND VANE RUNNERS, CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS". PROVIDE TURNING VANES ACCORPANCE WITH STALLING THAT SUPPORTED WITH BARS PERPENDICULAR TO BLADES, AND SET INTO SODE STRIPS SUITABLE FOR MOUNTING IN DUCTUORS, FOLLOW STACKA GUIDELINES FOR SPACING SUPPORT, AND CONSTRUCTION, ALL BLADES SHALL BE DOUBLE THICKNESS AIRFOIL TYPE
- E. BIRD SCREENS AND FRAMES: PROVIDE BIRD SCREENS THAT CONFORM TO ASTM E 2016, NO. 2 MESH, ALUMINUM OR STANLESS STEEL. PROVIDE "MEDIUM-LIGHT" RATED ALUMINUM SCREENS. PROVIDE "LIGHT" RATES STANLESS STEEL SCREENS. E DUCT-MOUNTED ACCESS DOORS: FABRICATE ACCESS PANELS ACCORDING TO SMACNA'S "HVAC DUCT
- CONSTRUCTION STANDARDS METAL AND FLEXIBLE"± FIGURES 2-10, "DUCT ACCESS DOORS AND PANELS," AND 2-11, "ACCESS PANELS ROUND DUCT." PART 3 - EXECUTION
- 3.1 INSTALLATION
- INSTALL DUCTUORK, ACCESSORIES, AND SUPPORTS ACCORDING TO SMACNA'S "HYAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE" UNLESS OTHERWISE INDICATED.
- B. SEAL DUCTS TO THE FOLLOWING SEAL CLASSES ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE": I-INCH WG, SEAL CLASS A.
- C. CONCEAL DUCTS FROM VIEW IN FINISHED AND OCCUPIED SPACES. D. AVOID PASSING THROUGH OR ABOVE ELECTRICAL EQUIPMENT SPACES AND ENCLOSURES.
- E. CLEAN DUCT SYSTEMS BEFORE TESTING, ADJUSTING, AND BALANCING 32 TESTING ADJUSTING AND BALANCING
- A BALANCE AIRFLOW WITHIN DISTRIBUTION SYSTEMS, INCLUDING SUBMAINS, BRANCHES, AND TERMINALS TO INDICATED QUANTITIES PER SPECIFICATIONS

## SECTION 233423 - HVAC EXHAUST FANS

PART 2 - PRODUCTS

- 2.I PERFORMANCE REQUIREMENTS
- A. PRODUCTS SHALL BE LICENSED TO USE THE AMCA-CERTIFIED RATINGS SEAL
- B. EXHAUST FANA SHALL COMPLY WITH UI 1/25 TYPE LEANS SHALL ALSO COMPLY WITH UI 1/6/
- C. TYPE I FANS TO BE DESIGNED FOR HIGH HEAT OPERATION AT 300°F. D. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATIO
- 22 CENTRIFUGAL VENTILATORS

SSORIES:

- A. HOUSING: REMOVABLE, SPUN-ALUMINUM, DOME TOP AND OUTLET BAY BASE WITH VENTUR! INLET CONE.
- UPBLAST UNITS: ALUMINUM DISCHARGE BAFFLE TO DIRECT DISC SNOW DRAINS.
- B. FAN WHEELS: ALUMINUM HUB AND WHEEL WITH BACKWARD LINED BLADES
- C. BELT-DRIVEN DRIVE ASSEMBLY: RESILIENTLY NOUNCE TO HOUSING
- FAN SHAFT: TURNED, GROUND, AND
   SHAFT BEARINGS: PERMANDING LUBI FFI ± KFYF TO WHEEL HUB
- Y SEALED, SELF-ALIGNING BALL BEARINGS
- 3. PULLEYS: CAST-IRON, ADJU
- YPE, WITH THERMAL-OVERLOAD PROTECTION, FACTORY WIRED
- IGH AN INTERNAL 1 CONDUIT ABLE, 1/2-INCH MESH, ALUMINUM OR BRASS WIRE. SCREENS: R
- BALANCED, PARALLEL-BLADE, BACKDRAFT DAMPERS MOUNTED IN CURB BASE± MOTOR DAMPERS: PARALLEL-BLADE DAMPERS MOUNTED IN CURB BASE WITH ELECTRIC ACTUALORS WHEN FAN STOPS.
- REASE BOX FOR TYPE I EXHAUST FANS. 6 G2 GREASE GILARD FOR TYPE I EXHAUST FANS
- ROOF CURBS: 20 GAUGE GALVANIZED STEEL! MITERED AND WELDED CORNERS! 1-1/2-INCH THICK, RIGID, FIBERGLASS INSULATION ADHERED TO INSIDE WALLS! AND 1-1/2-INCH WOOD NAILER. SIZE AS REQUIRED TO SUIT ROOF OPENING AND FAN BASE.

2. OVERALL HEIGHT: 12 INCHES FOR GENERAL EXHAUST FANS: 20 INCHES FOR KITCHEN EXHAUST FANS

- 1. CONFIGURATION: SELF-FLASHING WITHOUT A CANT STRIP, WITH MOUNTING FLANGE.
- 3. PITCH MOUNTING: MANUFACTURE CURB FOR ROOF SLOPE. 4. MOUNTING PEDESTAL: GALYANIZED STEEL WITH REMOVABLE ACCESS PANEL.
- 5. TYPE I ROOF CURBS TO BE VENTED TYPE.
- 6. TYPE I AND TYPE 2 ROOF CURBS TO BE HINGED TYPE. F. CAPACITIES AND CHARACTERISTICS:
- 1 SEE SCHEDULE
- 23 MOTORS A COMPLY WITH NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, ENCLOSURE TYPE, AND EFFICIENCY REQUIREMENTS FOR MOTORS.
- MOTOR SIZES: MINIMUM SIZE AS INDICATED. IF NOT INDICATED, LARGE ENOUGH SO DRIVEN LOAD WILL NOT REQUIRE MOTOR TO OPERATE IN SERVICE FACTOR RANGE ABOVE 10.
- B. ENCLOGURE TYPE: TOTALLY ENCLOSED, FAN COOLED.
- PART 3 EXECUTION
- 3.1 INSTALLATION A. INSTALL UNITS WITH CLEARANCES FOR SERVICE AND MAINTENANCE.
- B. ROOF-MOUNTED UNITS: INSTALL ROOF CURB ON ROOF STRUCTURE, ACCORDING TO ARIGUIDELINE B. INSTALL AND SECURE ROOF-MOUNTED FANS ON CURBS, AND COORDINATE ROOF PENETRATIONS AND FLASHING WITH ROOF CONSTRUCTION.

# END OF SECTION 233423

Drawn: BMD lob: 18-082

M8

MECHANICAL SPECIFICATIONS

REVISIONS

Date: 08, 24, 18 Project Mgr: DM