

SECTION 15010 - BASIC MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 CODES AND REGULATORY REQUIREMENTS

- A. EXECUTE WORK IN COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE AND MUNICIPAL LAWS, CODES, ORDINANCES, AND LOCAL CUSTOMS REGARDING THE TRADE TO PERFORM THE WORK.
B. CODES SHALL GOVERN IN CASE OF ANY DIRECT CONFLICT BETWEEN CODES AND PLANS AND SPECIFICATIONS; EXCEPT WHEN PLANS AND SPECIFICATIONS REQUIRE HIGHER STANDARDS THAN THOSE REQUIRED BY CODE.
C. IN ADDITION, THE FOLLOWING PUBLISHED STANDARDS AND REGULATIONS SHALL BE ADHERED TO AS APPLICABLE TO THE WORK INVOLVED.

1.2 SUBMITTALS

- A. SUBMIT TECHNICAL PRODUCT DATA FOR EQUIPMENT INCLUDING SPECIFICATIONS, CAPACITY RATINGS, PERFORMANCE CURVES WITH OPERATING POINT CLEARLY INDICATED, GAUGES, AND FINISHES OF MATERIALS, DIMENSIONS, WEIGHTS, ACCESSORIES FURNISHED, WIRING DIAGRAMS, INSTALLATION INSTRUCTION AND MAINTENANCE DATA.
B. INCREASE, BY THE QUANTITY LISTED BELOW, THE NUMBER OF MECHANICAL RELATED SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES SUBMITTED, TO ALLOW FOR REQUIRED DISTRIBUTION PLUS ONE COPY OF EACH SUBMITTAL REQUIRED, WHICH WILL BE RETAINED BY THE MECHANICAL CONSULTING ENGINEER.
C. ADDITIONAL COPIES MAY BE REQUIRED BY INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS.
D. SUBMITTAL OF SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES WILL BE ACCEPTED ONLY WHEN SIGNED AND SUBMITTED BY THE MECHANICAL CONTRACTOR AND THE GENERAL CONTRACTOR.

1.3 RECORD DOCUMENTS

- A. PREPARE RECORD DOCUMENTS IN ACCORDANCE WITH THE REQUIREMENTS IN SPECIAL AND GENERAL CONDITIONS CONTRACTOR - FURNISHED DRAWINGS, DATA, SAMPLES AND PRODUCT OPTIONS AND AS-BUILT DATA. THESE DRAWINGS SHALL REFLECT THE ACTUAL "AS-BUILT" CONDITION INCLUDING ANY CHANGE ORDERS, OF THE MECHANICAL SYSTEMS AND INSTALLATION. IN ADDITION TO THE REQUIREMENTS SPECIFIED IN SPECIAL AND GENERAL CONDITIONS, INDICATE THE FOLLOWING INSTALLED CONDITIONS:

- 1. EQUIPMENT LOCATIONS (EXPOSED AND CONCEALED), DIMENSIONED FROM PROMINENT BUILDING LINES.
2. APPROVED SUBSTITUTIONS, CONTRACT MODIFICATIONS, AND ACTUAL EQUIPMENT AND MATERIALS INSTALLED.
3. CONTRACT MODIFICATIONS, ACTUAL EQUIPMENT AND MATERIALS INSTALLED.

1.4 OPERATING AND MAINTENANCE DATA

- A. SUBMISSION: SUBMIT TWO TYPED AND BOUND COPIES OF OPERATING AND MAINTENANCE MANUAL, 8-1/2 X 11 INCHES IN SIZE TO THE ENGINEER FOR APPROVAL PRIOR TO SCHEDULING ANY SYSTEMS DEMONSTRATION FOR THE OWNER.
B. REQUIREMENT CONTENTS: MANUALS SHALL HAVE INDEX WITH TAB DIVIDERS FOR EACH MAJOR EQUIPMENT SECTION TO FACILITATE LOCATING INFORMATION ON SPECIFIC PIECE OF EQUIPMENT. IDENTIFY DATA WITHIN EACH SECTION WITH DRAWING CODE NUMBERS AS THEY APPEAR ON DRAWINGS AND SPECIFICATIONS. INCLUDE AS MINIMUM THE FOLLOWING DATA:
1. ALPHABETICAL LIST OF SYSTEM COMPONENTS, WITH THE NAME, ADDRESS AND 24 HOUR TELEPHONE NUMBER OF THE COMPANY RESPONSIBLE FOR SERVICING AND EACH ITEM DURING THE FIRST YEAR OF OPERATION.
2. OPERATING INSTRUCTIONS FOR COMPLETE SYSTEM INCLUDING:
A. EMERGENCY PROCEDURES FOR FIRE OR FAILURE OF MAJOR EQUIPMENT.
B. MAJOR START, OPERATION AND SHUTDOWN PROCEDURES.
3. MAINTENANCE INSTRUCTIONS INCLUDING:
A. VALVE TAGS AND OTHER IDENTIFIED EQUIPMENT LISTS.
B. PROPER LUBRICANTS AND LUBRICATING INSTRUCTIONS FOR EACH PIECE OF EQUIPMENT.
C. NECESSARY CLEANING, REPLACEMENT AND/OR ADJUSTMENT SCHEDULE.
4. PRODUCT DATA ON EACH PIECE OF EQUIPMENT INCLUDING:
A. INSTALLATION INSTRUCTIONS.
B. DRAWINGS AND SPECIFICATIONS.
C. PARTS LISTS.
D. COMPLETE WIRING AND TEMPERATURE CONTROL DIAGRAMS (AS-BUILT).
E. MARKED OR CHANGED PRINTS LOCATING CONCEALED PARTS AND VARIATIONS FROM THE ORIGINAL SYSTEM DESIGN.
1.5 WARRANTIES

- A. IN ADDITION TO THE REQUIREMENTS IN THE SPECIAL AND GENERAL CONDITIONS REFER TO INDIVIDUAL EQUIPMENT SPECIFICATIONS FOR WARRANTY REQUIREMENTS.
B. COMPILE AND ASSEMBLE THE WARRANTIES, INTO A SEPARATED SET OF VINYL COVERED, THREE RING BINDERS, TABULATED AND INDEXED FOR EASY REFERENCE.
C. PROVIDE COMPLETE WARRANTY INFORMATION FOR EACH ITEM TO INCLUDE PRODUCT OR EQUIPMENT TO INCLUDE DATE OF BEGINNING OF WARRANTY OR BOND; DURATION OF WARRANTY OR BOND; AND NAMES, ADDRESSES, AND TELEPHONE NUMBERS AND PROCEDURES FOR FILING A CLAIM AND OBTAINING WARRANTY SERVICES.

D. THIS CONTRACTOR SHALL WARRANT ALL MATERIAL AND EQUIPMENT INSTALLED BY HIM FOR A PERIOD OF 1 YEAR AFTER COMPLETION OF THE PROJECT.

END OF SECTION 15010

SECTION 15767 - PROPELLER ELECTRIC UNIT HEATERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND OTHER DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.

1.2 QUALITY ASSURANCE

- A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
1. REZNOR.
2. INDEECO.
3. MODINE.
4. RUFFNECK HEATERS
5. TRANE.

2.2 UNIT HEATERS

- A. DESCRIPTION: AN ASSEMBLY INCLUDING CASING, COIL, FAN, AND MOTOR IN HORIZONTAL DISCHARGE CONFIGURATION WITH ADJUSTABLE DISCHARGE LOUVERS.

2.3 CASING

- A. 14 GA CABINET: REMOVABLE PANELS FOR MAINTENANCE ACCESS TO CONTROLS.
B. CABINET FINISH: MANUFACTURER'S STANDARD EPOXY COATING APPLIED TO FACTORY-ASSEMBLED AND TESTED PROPELLER UNIT HEATER BEFORE SHIPPING.
C. DISCHARGE LOUVER: ADJUSTABLE FIN DIFFUSER FOR HORIZONTAL UNITS.

2.4 ELECTRIC-RESISTANCE HEATING ELEMENTS

- A. STAINLESS STEEL TUBULAR.

2.5 FAN

- A. PROPELLER TYPE, ALUMINUM WHEEL DIRECTLY MOUNTED ON MOTOR SHAFT IN THE FAN VENTURI.

2.6 FAN MOTORS

- A. MOTOR TYPE: THERMALLY PROTECTED, TOTALLY ENCLOSED, FACTORY LUBRICATED.

2.7 CONTROLS

- A. CONTROL DEVICES:
1. UNIT-MOUNTED FAN-SPEED SWITCH.
2. UNIT-MOUNTED THERMOSTAT.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. EXAMINE AREAS TO RECEIVE PROPELLER UNIT HEATERS FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING PERFORMANCE.
B. EXAMINE ROUGHING-IN FOR PIPING AND ELECTRICAL CONNECTIONS TO VERIFY ACTUAL LOCATIONS BEFORE PROPELLER UNIT-HEATER INSTALLATION.
C. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.2 INSTALLATION

- A. INSTALL PROPELLER UNIT HEATERS LEVEL AND PLUMB.
B. INSTALL PROPELLER UNIT HEATERS TO COMPLY WITH NFPA 90A.
C. SUSPEND PROPELLER UNIT HEATERS FROM STRUCTURE WITH ALL-THREAD HANGER RODS.

3.3 CONNECTIONS

- A. ELECTRICAL INSTALLATION REQUIREMENTS ARE SPECIFIED IN OTHER SPECIFICATION SECTIONS.
B. INSTALL ELECTRICAL CONDUIT ADJACENT TO MACHINE TO ALLOW SERVICE AND MAINTENANCE.

END OF SECTION 15767

SECTION 15820 - LOUVERS AND DAMPERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.

1.2 SUMMARY

- A. THIS SECTION INCLUDES THE FOLLOWING:
1. COMBINATION DAMPER/LOUVERS

1.3 SUBMITTALS

- A. PRODUCT DATA: FOR THE FOLLOWING:
1. COMBINATION DAMPER/LOUVERS
B. SHOP DRAWINGS: DETAIL EQUIPMENT ASSEMBLIES AND INDICATE DIMENSIONS, WEIGHTS, LOADS, REQUIRED CLEARANCES, METHOD OF FIELD ASSEMBLY, COMPONENTS, AND LOCATION AND SIZE OF EACH FIELD CONNECTION.
1. MOTORIZED CONTROL DAMPER INSTALLATIONS.
2. WIRING DIAGRAMS: POWER, SIGNAL, AND CONTROL WIRING..

1.4 QUALITY ASSURANCE

- A. COMPLY WITH NFPA 90A, "INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS," AND NFPA 90B, "INSTALLATION OF WARM AIR HEATING AND AIR CONDITIONING SYSTEMS."

PART 2 - PRODUCTS

2.1 COMBINATION LOUVER/DAMPERS

- A. MANUFACTURERS:
1. ARROW UNITED INDUSTRIES
2. LOUVERS AND DAMPERS
3. RUSKIN
4. GREENHECK.
5. METALAIRE.

- B. GENERAL DESCRIPTION: AMCA-RATED, PARALLEL BLADE DESIGN; EXTRUDED ALUMINUM 6063-T6/T52 ALLOY FRAME AND BLADE, FRAME 0.080" THICK, BLADE 0.80" THICK ON 4-1/2" CTRS.
1. ADJUSTABLE BLADE: EXTRUDED ALUMINUM 6063-T6/T52 ALLOY, 0.125" THICK.
2. LINKAGE: EXTRUDED ALUMINUM, CONCEALED IN CHANNEL OUT OF AIRSTREAM. PIVOTS ARE 0.5" DIA. MACHINED STEEL, CADMIUM PLATED AND CHROMATE TREATED. PIVOTS ROTATE IN A CELCON BEARING. A 0.312" DIA ALUMINUM LINKAGE ROD IS LOCKED TO THE PIVOT BY A SET SCREW WITH AN EPOXY LOCKING PATCH.
3. SHAFTS: 0.5" DIA. ALUMINUM "PIN-LOCK" ROD.
4. SEALS: EXTRUDED SILICONE RUBBER SEAL AT BLADE EDGE. STAINLESS STEEL AT JAMB.
5. BIRD SCREEN: 0.5" FLATTENED ALUMINUM, 0.051" THICK.
6. PROVIDE LOUVERS WITH WATER PENETRATION AND PRESSURE DROP NO GREATER THAN SPECIFIED LOUVER, AND WITH FREE AREA NO LESS THAN SPECIFIED LOUVER.
7. PROVIDE 120 VOLT DAMPER OPERATORS WITH SPRING RETURN & AUXILIARY END SWITCH.

PART 3 - EXECUTION

3.1 APPLICATION AND INSTALLATION

- A. INSTALL DUCT ACCESSORIES ACCORDING TO APPLICABLE DETAILS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS-METAL AND FLEXIBLE" FOR METAL DUCTS.
B. PROVIDE DUCT ACCESSORIES OF MATERIALS SUITED TO DUCT MATERIALS.

END OF SECTION 15820

SECTION 15870 - POWER VENTILATORS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. EXTENT OF POWER VENTILATOR WORK REQUIRED BY THIS SECTION IS INDICATED ON DRAWINGS AND SCHEDULES, AND BY REQUIREMENTS OF THIS SECTION.

1.2 QUALITY ASSURANCE

- A. CODES AND STANDARDS:
8. AMCA COMPLIANCE: PROVIDE LOUVERS, POWER VENTILATORS AND PENTHOUSES WHICH HAVE BEEN TESTED AND RATED IN ACCORDANCE WITH AMCA STANDARDS, AND BEAR AMCA CERTIFIED RATINGS SEAL.
9. UL COMPLIANCE: PROVIDE POWER VENTILATORS WHICH ARE DESIGNED, MANUFACTURED, AND TESTED IN ACCORDANCE WITH UL 705 "POWER VENTILATORS."
10. NEMA COMPLIANCE: PROVIDE MOTORS AND ELECTRICAL ACCESSORIES COMPLYING WITH NEMA STANDARDS.

1.3 SUBMITTALS

- A. PRODUCT DATA: SUBMIT MANUFACTURER'S TECHNICAL DATA FOR POWER VENTILATORS, INCLUDING SPECIFICATIONS, CAPACITY RATINGS, DIMENSIONS, WEIGHTS, MATERIALS, ACCESSORIES FURNISHED, AND INSTALLED INSTRUCTIONS.

PART 2 - PRODUCTS

2.1 WALL MOUNTED EXHAUST FANS

- A. GENERAL: EXCEPT AS OTHERWISE INDICATED, PROVIDE STANDARD PREFABRICATED POWER VENTILATOR UNITS OF TYPE AND SIZE INDICATED, MODIFIED AS NECESSARY TO COMPLY WITH REQUIREMENTS, AND AS REQUIRED FOR COMPLETE INSTALLATION.
B. DRIVES: PULLEYS AND BELTS FOR BELT DRIVE UNITS SHALL BE DESIGNED AND SELECTED FOR 150% (MINIMUM) OF THE MOTOR HORSEPOWER. ADJUSTABLE SHEAVE, BELT GUARD.
C. MANUFACTURERS:
1. AEROVENT
2. HARTZELL
3. BUFFALO
4. COOK
5. GREENHECK
6. PENN
7. JENNAIR

2.2 DIRECT DRIVE, AXIAL SIDEWALL PROPELLER FANS

- A. FANS SHALL BE OF THE DIRECT DRIVE PANEL TYPE AND SHALL BE OF THE SIZE AND CAPACITY AS INDICATED IN THE FAN SCHEDULE. DIRECT DRIVE PANEL FANS SHALL BE TESTED AND CERTIFIED IN ACCORDANCE WITH ANSI/ASHRAE 51-1985 AND ANSI/AMCA 210-85 TEST CODES AND GUARANTEED BY THE MANUFACTURER TO DELIVER AT THE RATED PUBLISHED PERFORMANCE LEVEL. IN ADDITION, EACH UNIT SHALL BE FACTORY RUN TESTED PRIOR TO SHIPMENT. THE DIRECT DRIVE PANEL FANS MUST BE LICENSED TO BEAR THE AMCA CERTIFIED RATING SEAL FOR AIR PERFORMANCE.
B. CONSTRUCTION - THE FAN CASING SHALL BE CONSTRUCTED OF MILD STEEL WITH AN INTEGRAL DEEP SPUN ORIFICE PANEL OR RING.
-FOR PANEL SIZES THROUGH 21", THE HOUSING WILL BE 16-GAUGE.
-FOR PANEL SIZES 24" THROUGH 48", THE HOUSING WILL BE 14-GAUGE.
-FOR PANEL SIZES 54" THROUGH 72", THE HOUSING WILL BE 12-GAUGE.

- C. THE DIRECT DRIVE PANEL FANS SHALL BE CONSTRUCTED WITH A WELDED REINFORCED MOTOR BASE PLATE WHICH IS SUPPORTED BY A WELDED SPIDER TYPE FRAME. THIS CONSTRUCTION ALLOWS FOR MOUNTING THE UNIT FROM THE FLANGED FRONT ENTRANCE ORIFICE.

- D. PROPELLERS - THE PRECISION AIRFOIL FAN BLADES AND HUB SHALL BE CAST OF A319 ALUMINUM ALLOY. THE PROPELLER SHALL BE MOUNTED DIRECTLY ON THE MOTOR SHAFT.

- E. BALANCING - THE PROPELLER ASSEMBLY SHALL BE STATICALLY AND DYNAMICALLY BALANCED IN ACCORDANCE WITH ANSI / AMCA 204 - 96 "BALANCE QUALITY AND VIBRATION LEVELS FOR FANS" TO FAN APPLICATION CATEGORY BV - 3, BALANCE QUALITY GRADE G6.3.

- F. MOTORS - FAN MOTORS SHALL BE FOOT-MOUNTED NEMA DESIGN B, STANDARD INDUSTRIAL CONTINUOUS DUTY, BALL BEARING, VARIABLE TORQUE TYPE SUITABLE FOR OPERATION ON VOLTAGE, PHASE AND HERTZ, AS LISTED IN THE FAN SCHEDULE. MOTOR BEARINGS SHALL HAVE A MINIMUM L-10 LIFE, AS DEFINED BY AFBMA, OF AT LEAST 40,000 HOURS (200,000 HOURS AVERAGE LIFE).

- G. FINISH - THE UNIT, AFTER FABRICATION, SHALL BE CLEANED AND CHEMICALLY PRETREATED BY A PHOSPHATIZING PROCESS AND SHALL BE PAINTED INSIDE AND OUTSIDE WITH AN AIR DRY ENAMEL.

H. ACCESSORIES -

- 1. MOTORIZED DAMPER (STEEL/ALUMINUM)
2. WEATHERHOOD WITH BIRDSCREEN
3. DISCONNECT SWITCH
4. FULL ASSEMBLY
5. WALL SLEEVE

PART 3 - EXECUTION

3.1 INSPECTION

- A. GENERAL: EXAMINE AREAS AND CONDITIONS UNDER WHICH POWER VENTILATORS ARE TO BE INSTALLED. DO NOT PROCEED WITH WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.2 INSTALLATION OF WALL MOUNTED FANS AND HOODS

- A. GENERAL: EXCEPT AS OTHERWISE INDICATED OR SPECIFIED, INSTALL VENTILATORS IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOGNIZED INDUSTRY PRACTICES TO INSURE THAT VENTILATORS SERVE THEIR INTENDED FUNCTION. INSTALL EXHAUST FANS SO THAT IT MAY BE REMOVED FOR ACCESS TO THE DAMPERS. COORDINATE VENTILATOR WORK WITH WORK OF WALLS AND CEILINGS, AS NECESSARY FOR PROPER INTERFACING.
B. ELECTRICAL WIRING: INSTALL ELECTRICAL DEVICES FURNISHED BY MANUFACTURER BUT NOT SPECIFIED TO BE FACTORY MOUNTED. FURNISH COPY OF MANUFACTURER'S WIRING DIAGRAM SUBMITTAL TO ELECTRICAL INSTALLER.
1. VERIFY THAT ELECTRICAL WIRING INSTALLATION IS IN ACCORDANCE WITH MANUFACTURER'S SUBMITTAL AND INSTALLATION REQUIREMENTS OF DIVISION 16 SECTIONS. VERIFY PROPER ROTATION DIRECTION OF FAN WHEELS. DO NOT PROCEED WITH EQUIPMENT STARTUP UNTIL WIRING INSTALLATION IS ACCEPTABLE TO EQUIPMENT INSTALLER.
D. REMOVE SHIPPING BOLTS AND TEMPORARY SUPPORTS WITHIN VENTILATORS. ADJUST DAMPERS FOR FREE OPERATION.

END OF SECTION 15870



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RE-USE WATER PUMP STATION

CITY OF WICHITA, KANSAS

TO SERVE SPIRIT AEROSYSTEMS

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MECHANICAL SPECIFICATIONS

PROJECT NO. 468-85112

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SCALE AS NOTED

DESIGNED DRAWN CHECKED RLB CJK RLB

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