

SECTION 200500 GENERAL PROVISIONS

PART 1.00 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT INCLUDING GENERAL AND OTHER CONDITIONS AND DIVISION 1 - GENERAL REQUIREMENTS SECTIONS, APPLY TO THE WORK SPECIFIED IN THIS SECTION.
- B. INCLUDE ALL LABOR, MATERIAL, EQUIPMENT, TRANSPORTATION AND SERVICES TO FURNISH AND INSTALL COMPLETE MECHANICAL SYSTEMS AND ALTERATIONS AS SHOWN ON THE DRAWINGS AND HEREIN SPECIFIED. THE WORK INCLUDES, BUT IS NOT LIMITED TO:
 1. ALL PLUMBING WORK.
 2. ALL HEATING AND AIR CONDITIONING.
 3. INSULATION.
 4. TEMPERATURE CONTROLS.
 5. FIRE PROTECTION WORK.
 6. CONNECTION TO ALL UTILITIES.

1.02 DESCRIPTION OF WORK

- A. EXTENT OF MECHANICAL WORK IS INDICATED ON DRAWINGS OR SPECIFIED IN DIVISION 15 SECTIONS OF THE SPECIFICATION. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SUPERVISION AND SERVICE NECESSARY FOR A COMPLETE MECHANICAL SYSTEMS.

1.03 QUALITY ASSURANCE

- A. ALL WORK ACCOMPLISHED UNDER THESE SPECIFICATIONS SHALL BE IN ACCORDANCE WITH REQUIREMENTS AND RECOMMENDATIONS OF THE LOCAL COUNTY & STATE, NATIONAL FIRE PROTECTION ASSOCIATION, ACCEPTED MECHANICAL CODE, PLUMBING CODE, BUILDING CODE, AUTHORITIES HAVING JURISDICTION & ALL REQUIREMENTS PERTAINING TO THE MALL TENANT DESIGN MANUAL.

1.04 SUBMITTALS

- A. CONTRACTOR SHALL SUBMIT FOR REVIEW, SIX COPIES OF SHOP DRAWINGS, LITERATURE, AND EQUIPMENT LIST WITHIN 30 DAYS AFTER CONTRACT IS LET. FIRE PROTECTION DRAWINGS SHALL BE SUBMITTED PER SECTION 15500.
- B. SUBMIT PRIOR TO FABRICATION OR DELIVERY.
- C. SUBMIT COMPLETE, AT ONE TIME. PARTIAL SUBMITTALS WILL NOT BE CONSIDERED (EXCEPT AS NOTED ABOVE FOR CONTROLS, FIRE PROTECTION AND DUCTWORK).
- D. CATALOG SHEETS SHALL BE COMPLETE AND THE ITEM OR MODEL TO BE USED SHALL BE CLEARLY MARKED.
- E. LIST SUBSTITUTE ITEMS SEPARATELY AND SO IDENTIFIED.

PART 2.00 - PRODUCTS

2.01 MATERIALS

- A. ALL MATERIALS SHALL BE NEW AND OF MANUFACTURERS SPECIFIED HEREIN & BEAR THE U.L., ETL OR CSA LABEL.
- B. ALL EQUIPMENT SHALL BE REGULARLY CATALOGUED ITEMS OF THE MANUFACTURER AND IN USE FOR AT LEAST TWO YEARS AND SHALL BE SUPPLIED AS A COMPLETE UNIT IN ACCORDANCE WITH THE MANUFACTURER'S STANDARD SPECIFICATIONS AND ANY OPTIONAL ITEMS REQUIRED FOR PROPER INSTALLATION FOR THE EQUIPMENT UNLESS OTHERWISE NOTED. ALL EQUIPMENT AND MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND BEST TRADE PRACTICES.

2.02 SUBSTITUTIONS

- A. IN ALL CASES IN THIS SPECIFICATION WHERE AN ARTICLE IS FOLLOWED BY THE WORDS "OR APPROVED EQUAL", THE ARCHITECT IS THE SOLE JUDGE OF THE QUALITY OF THE PROPOSED SUBSTITUTION.
- B. WHEN THE ARCHITECT/OWNER APPROVES A SUBSTITUTION, THE APPROVAL IS GIVEN WITH THE UNDERSTANDING THAT THE CONTRACTOR GUARANTEES THE ARTICLE OR MATERIAL SUBSTITUTED TO BE EQUAL TO OR BETTER IN EVERY RESPECT THAN THE ARTICLE OR MATERIAL SPECIFIED. THE CONTRACTOR SHALL ALSO ASSUME COMPLETE RESPONSIBILITY THAT THE ARTICLE OR MATERIAL WILL FIT THE JOB AS FAR AS SPACE, ACCESS AND SERVICING REQUIREMENTS.
- C. WHERE SEVERAL MATERIALS ARE SPECIFIED BY NAME FOR ONE USE, SELECT FOR USE ANY OF THOSE SO SPECIFIED. NOTE THAT EQUIPMENT LAYOUT BASED ON EQUIPMENT LISTED IN EQUIPMENT SCHEDULE. ANY OTHER EQUIPMENT USED MUST FIT IN AVAILABLE SPACE WITH ALL ACCESS AND SERVICING REQUIREMENTS MAINTAINED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK THAT THIS EQUIPMENT WILL MEET THESE REQUIREMENTS.
- D. WHENEVER ITEM OR CLASS OF MATERIAL IS SPECIFIED EXCLUSIVELY BY DETAIL SPECIFICATION, TRADE NAME, MANUFACTURER'S NAME OR BY CATALOG REFERENCE, USE ONLY SUCH ITEM, UNLESS WRITTEN APPROVAL IS GIVEN FOR SUBSTITUTION PRIOR TO BID.

PART 3.00 - EXECUTION

3.01 DRAWINGS

- A. THE MECHANICAL DRAWINGS ARE GENERALLY DIAGRAMMATIC. COMPLETE DETAILS OF THE BUILDING WHICH AFFECT THE MECHANICAL INSTALLATION MAY NOT BE SHOWN. FOR ADDITIONAL DETAILS, THE CONTRACTOR IS REFERRED TO THE ARCHITECTURAL, STRUCTURAL, & ELECTRICAL DRAWINGS.

3.02 CODES, ORDINANCES AND PERMITS

- A. ALL WORK SHALL COMPLY WITH ALL APPLICABLE CODES AND ORDINANCES. ALL INSPECTION FEES AND PERMITS, COMPLIANCE WITH CODES AND ORDINANCES SHALL BE AT THE CONTRACTOR'S EXPENSE. INCLUDE ALL CONNECTION AND PERMIT FEES IN BID. WHEN APPLICABLE, CONTRACTOR SHALL CONTACT AUTHORITY HAVING JURISDICTION FOR INSPECTION OF ALL SYSTEMS IN A TIMELY MANNER BEFORE OCCUPANCY OF THE BUILDING.

3.03 CLEAN UP AND HOUSEKEEPING

- A. LEAVE ALL EQUIPMENT CLEAN AND READY FOR USE.
- B. REMOVE ALL LABELS, PAINT, PLASTER, ETC., FROM FIXTURES, EQUIPMENT AND PIPING.

3.04 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

- 1. PROVIDE COMPLETE OPERATING AND MAINTENANCE INSTRUCTIONS AND CATALOG SHEETS FOR ALL EQUIPMENT.
- 2. PROVIDE FOUR COPIES OF EACH BOUND INTO BOOKLET FORM.
- 3. DELIVER BOOKLETS TO THE ARCHITECT BEFORE FINAL INSPECTION.
- B. CONTENTS: EACH BOOKLET SHALL CONTAIN AT LEAST, BUT NOT LIMITED TO MAINTENANCE INSTRUCTIONS AND PARTS LIST AS FOLLOWS:
 1. BASIC DESCRIPTION OF ALL SYSTEMS.
 2. DESCRIPTION OF ROUTINE MAINTENANCE REQUIRED FOR EACH COMPONENT, INCLUDING OILING INSTRUCTIONS.
 3. SUGGESTED FREQUENCY OF MAINTENANCE.
 4. PARTS LIST OF ALL EQUIPMENT.
 5. OPERATING INSTRUCTIONS AND WARRANTIES ON ALL EQUIPMENT.
 6. CONTROLS: AS-BUILT WIRING DIAGRAMS
 7. MECHANICAL AS-BUILT DRAWINGS.
 8. TROUBLE-SHOOTING LIST.
 9. NAME, ADDRESS, PHONE NUMBER OF ALL CONTRACTORS AND SUPPLIERS PARTICIPATING IN PROJECT.

3.05 RECORD DRAWINGS

- A. PROVIDE THE ARCHITECT WITH RECORD DRAWINGS. RECORD DRAWINGS SHALL BE ELECTRONIC PDF FILES OR AS REQUESTED BY ARCHITECT & ONE REPRODUCIBLE COPY AND SHALL SHOW THE MEASURED LOCATIONS OF ALL CONCERNED PORTIONS OF THE WORK AND SHALL SHOW ALL CHANGES THE CONTRACTOR HAS MADE.
- B. DRAWINGS MUST SHOW ALL ADDENDUM ITEMS, CHANGE ORDERS AND DEVIATIONS FROM THE PLANS.

3.06 INTERFERENCE

- A. THE MECHANICAL CONTRACTOR'S ATTENTION IS CALLED TO THE RESTRICTED SPACE FOR INSTALLATION OF MECHANICAL SYSTEMS. OFFSETS, REROUTING AND COORDINATION WILL BE REQUIRED TO FIT ALL ELEMENTS IN AVAILABLE SPACE AND THE MECHANICAL CONTRACTOR SHALL INCLUDE PROVISIONS FOR SUCH IN HIS BIDDING.
- B. DUCTWORK AND PIPING SHALL BE ROUTED TO CLEAR LIGHT FIXTURES. COORDINATE ROUTING OF DUCTWORK AND PIPING WITH EACH OTHER SO GRADE OF PIPING CAN BE ACCOMPLISHED, AND TO FIT IN AVAILABLE SPACE.
- C. DUCTWORK SHALL BE INSTALLED AS REQUIRED TO CLEAR LIGHT FIXTURES AND TO FIT IN AVAILABLE SPACE. PROVIDE OFFSETS, V OR SLEEVES AS REQUIRED. MAINTAIN EQUIVALENT FREE AREA OF DUCTWORK.
- D. DUCTWORK TAKES PRECEDENCE OVER PIPING FOR AVAILABLE SPACE AND ROUTING. COORDINATE INSTALLATION BASED ON THIS PRECEDENCE.
- E. DUCTWORK AND/OR PIPING SHALL NOT BE RUN OVER ELECTRICAL PANELS.

3.07 WORKMANSHIP

- A. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH BEST TRADE PRACTICE. ANY SUBSTANDARD WORKMANSHIP SHALL BE REMOVED AND REPLACED AT NO EXTRA COST TO THE OWNER.

3.08 SEISMIC RESTRAINTS

- A. PROVIDE SEISMIC RESTRAINTS ON ALL PIPING AND DUCTWORK IN ACCORDANCE WITH THE "GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS" AS PREPARED BY SMACNA AND THE PLUMBING PIPING INSTITUTE COUNCIL.
- B. PROVIDE SEISMIC RESTRAINTS ON ALL EQUIPMENT AND PROVIDE SLACK CABLE RESTRAINTS ON ALL SUSPENDED EQUIPMENT. COMPLETE RESTRAINT SYSTEM SHALL BE SELECTED, SHOP DRAWINGS SEALED BY PROFESSIONAL CERTIFICATION PROVIDED BY A PROFESSIONAL STRUCTURAL ENGINEER.

SECTION 200513 ELECTRICAL PROVISIONS TO MECHANICAL WORK

PART 1.00 - GENERAL

1.01 DESCRIPTION

- A. GENERAL REQUIREMENTS DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND OTHER CONDITIONS AND DIVISION 1 - GENERAL REQUIREMENTS SECTIONS, APPLY TO THE WORK SPECIFIED IN THIS SECTION.

1.02 STANDARDS

- A. FOR ELECTRICAL EQUIPMENT AND PRODUCTS, EMPLOY WITH APPLICABLE NEMA STANDARDS, AND REFER TO NEMA STANDARDS FOR DEFINITIONS OF TERMINOLOGY HEREIN. COMPLY WITH NATIONAL ELECTRICAL CODE (NFPA 70) FOR WORKMANSHIP AND INSTALLATION REQUIREMENTS AND TO APPLICABLE SECTIONS OF DIVISION 16 OF THE SPECIFICATIONS.

PART 2.00 - PRODUCTS

2.01 MOTORS

- A. MANUFACTURER
 1. EXCEPT WHERE ITEM OF MECHANICAL EQUIPMENT (WHICH OTHERWISE COMPLIES WITH REQUIREMENTS) MUST BE INTEGRALLY EQUIPPED WITH MOTOR PRODUCED BY ANOTHER MANUFACTURER, PROVIDE MOTORS FOR MECHANICAL EQUIPMENT.
- B. MOTOR CHARACTERISTICS

- 1. EXCEPT WHERE MORE STRINGENT REQUIREMENTS ARE INDICATED, AND EXCEPT WHERE REQUIRED ITEM OF MECHANICAL EQUIPMENT CANNOT BE OBTAINED WITH FULLY COMPLYING MOTOR, COMPLY WITH THE FOLLOWING REQUIREMENTS FOR MOTORS OF MECHANICAL WORK:
 - A. TEMPERATURE RATING: RATED FOR 40 DEG. C ENVIRONMENT WITH MAXIMUM 50 DEG. C TEMPERATURE RISE FOR CONTINUOUS DUTY AT FULL LOAD (CLASS A INSULATION STARTING CAPABILITY). PROVIDE EACH MOTOR CAPABLE OF MAKING STARTS AS FREQUENTLY AS INDICATED BY AUTOMATIC CONTROL SYSTEM, AND NOT LESS THAN 5 STARTS/HOUR FOR MANUALLY CONTROLLED MOTORS.
 - B. PHASES AND CURRENT CHARACTERISTICS: PROVIDE SQUIRREL-CAGE INDUCTION POLYPHASE MOTORS FOR 1 HP AND LARGER, AND PROVIDE CAPACITOR-START SINGLE-PHASE MOTORS FOR 3/4 HP AND SMALLER, EXCEPT 1/8 HP AND SMALLER MAY, AT EQUIPMENT MANUFACTURER'S OPTION, BE SPLIT-PHASE TYPE. COORDINATE CURRENT CHARACTERISTICS WITH POWER SPECIFIED IN DIVISION-16 SECTIONS, AND WITH INDIVIDUAL EQUIPMENT REQUIREMENTS SPECIFIED IN OTHER DIVISION-15 REQUIREMENTS. FOR 2-SPEED MOTORS PROVIDE 2 SEPARATE WINDINGS ON POLYPHASE MOTORS. DO NOT PURCHASE MOTORS UNTIL POWER CHARACTERISTICS AVAILABLE AT LOCATIONS OF MOTORS HAVE BEEN CONFIRMED, AND UNTIL ROTATION DIRECTIONS HAVE BEEN CONFIRMED.
 - C. SERVICE FACTOR: 1.15 FOR POLYPHASE MOTORS, AND 1.35 FOR SINGLE-PHASE MOTORS.
- D. MOTOR CONSTRUCTION

- 1. PROVIDE GENERAL PURPOSE, CONTINUOUS DUTY MOTORS, DESIGN "B", EXCEPT "C" WHERE REQUIRED FOR HIGH STARTING TORQUE.

- A. FRAMES: NEMA NO. 48.
- B. BEARINGS: BALL OR ROLLER BEARINGS WITH INNER AND OUTER SHAFT SEALS, PERMANENTLY SEALED. WHERE BELT DRIVES AND OTHER DRIVES PRODUCE LATERAL OR AXIAL THRUST IN MOTOR, PROVIDE BEARINGS DESIGNED TO RESIST THRUST LOADING. REFER TO INDIVIDUAL SECTIONS OF DIVISION-15 FOR FRACTIONAL-HP LIGHT-DUTY MOTORS WHERE SLEEVE-TYPE BEARINGS ARE PERMITTED.
- C. ENCLOSURE TYPE: EXCEPT AS OTHERWISE INDICATED PROVIDE OPEN DROP-PROOF MOTORS FOR INDOOR USE WHERE SATISFACTORILY HOUSED OR REMOTELY LOCATED DURING OPERATION, AND PROVIDE GUARDED DRIP-PROOF MOTORS WHERE EXPOSED TO CONTACT BY EMPLOYEES OR BUILDING OCCUPANTS. PROVIDE WEATHER-PROTECTED TYPE I FOR OUTDOOR USE, TYPE II WHERE NOT HOUSED. REFER TO INDIVIDUAL SECTIONS OF DIVISION-15 FOR OTHER ENCLOSURE REQUIREMENTS.
- D. OVERLOAD PROTECTION: PROVIDE BUILT-IN THERMAL OVERLOAD PROTECTION FOR 120V MOTORS.
- E. EFFICIENCY: MOTORS ARE TO BE "ENERGY EFFICIENT" HAVING MINIMUM EFFICIENCY AS SCHEDULED IN ACCORDANCE WITH IEEE STANDARD 112, TEST METHOD B, EFFICIENCY
- F. PROVIDE MOTORS WITH MINIMUM 85 % PROVIDE POWER FACTOR, WHERE LESS THAN 85 % PER ENERGY CODES CORRECT TO

D. NAMEPLATE

- PROVIDE METAL NAMEPLATE ON EACH MOTOR, INDICATING FULL IDENTIFICATION OF MANUFACTURER, RATINGS, CHARACTERISTICS, CONSTRUCTION, SPECIAL FEATURES, AND SIMILAR INFORMATION.

2.02 STARTERS, ELECTRICAL DEVICES AND WRING

- A. MOTOR STARTER MANUFACTURER
 1. EXCEPT WHERE ITEM OF MECHANICAL EQUIPMENT MUST BE INTEGRALLY FURNISHED WITH MOTOR STARTER PRODUCED BY ANOTHER MANUFACTURER, PROVIDE MOTOR STARTERS FOR MECHANICAL EQUIPMENT MANUFACTURED BY ONE OF THE FOLLOWING: CUTLER-HAMMER, GE OR SQUARE D.

- B. MOTOR STARTER CHARACTERISTICS
 1. COMPLY WITH NEMA STANDARDS AND NEC. PROVIDE TYPE I GENERAL PURPOSE ENCLOSURES WITH PAD LOCK EARS, AND WITH FRAMES AND SUPPORTS FOR MOUNTING ON WALL, FLOOR OR PANEL AS INDICATED. PROVIDE TYPE AND SIZE OF STARTER RECOMMENDED BY MOTOR MANUFACTURER AND EQUIPMENT MANUFACTURER FOR APPLICABLE PROTECTION AND START-UP CONDITION; REFER TO INDIVIDUAL EQUIPMENT SECTIONS FOR BASIC LOAD REQUIREMENTS.

- A. MANUAL SWITCHES: PROVIDE MANUAL SWITCH AND PILOT LIGHT FOR MOTORS 1/2 HP AND SMALLER, EXCEPT WHERE INTERLOCK OR AUTOMATIC OPERATION IS INDICATED.
 - 1) OVERLOAD PROTECTION: PROVIDE MELTING ALLOY TYPE THERMAL OVERLOAD RELAYS.

- B. MAGNETIC STARTERS: PROVIDE MAGNETIC STARTERS FOR 3 PHASE MOTORS AND FOR SMALLER MOTORS WHERE INTERLOCK OR AUTOMATIC OPERATION IS INDICATED. INCLUDE THE FOLLOWING:
 - 1) HAND-OFF-AUTO SWITCH AND PILOT LIGHTS, PROPERLY ARRANGED FOR SINGLE-SPEED OR MULTI-SPEED OPERATION AS INDICATED.
 - 2) TRIP-FREE THERMAL OVERLOAD RELAYS, EACH PHASE.
 - 3) INTERLOCKS, PNEUMATIC SWITCHES, AND SIMILAR DEVICES AS REQUIRED FOR COORDINATION WITH CONTROL REQUIREMENTS OF DIVISION-15 CONTROLS SECTIONS.
 - 4) BUILT-IN 120-VOLT CONTROL CIRCUIT TRANSFORMER, FUSED FROM LINE SIDE, WHERE SERVICE EXCEEDS 240 VOLTS. WHEN A TRANSFORMER ISN'T USED THE CONTROL COIL SHALL FUSED.
 - 5) EXTERNALLY OPERATED MANUAL RESET.
 - 6) UNDERVOLTAGE RELEASE OR PROTECTION FOR EACH PHASE.

PART 3.00 - EXECUTION

3.01 STARTERS

- A. PROVIDE STARTERS AND WRING DEVICES FOR MOTORS. INSTALLATION BY DIVISION 16000.

3.02 MOTORS

- A. INSTALL MOTORS ON MOTOR MOUNTING SYSTEMS IN ACCORDANCE WITH MOTOR MANUFACTURER'S INSTRUCTIONS, SECURELY ANCHORED TO RESIST TORQUE, DRIVE THREATS, AND OTHER INHERENT IN MECHANICAL WORK. SECURE SHEAVES AND OTHER DRIVE UNITS TO MOTOR SHAFTS WITH KEYS AND ALLEN SET SCREWS, EXCEPT MOTORS OF 1/3 HP AND LESS MAY BE SECURED INDICATED, SET MOTOR SHAFTS PARALLEL WITH MACHINE SHAFTS.

3.03 EQUIPMENT FABRICATION

- A. FABRICATE MECHANICAL EQUIPMENT FOR SECURE MOUNTING OF MOTORS AND OTHER ELECTRICAL ITEMS INCLUDING IN WORK. PROVIDE EITHER PERMANENT ALIGNMENT OF MOTORS WITH EQUIPMENT, OR ADJUSTABLE MOUNTINGS AS APPLICABLE FOR BELT DRIVES, GEAR DRIVES, SPECIAL COUPLINGS AND SIMILAR INDIRECT COUPLING OF EQUIPMENT. PROVIDE SAFE, SECURE, DURABLE, AND REMOVABLE GUARDS FOR MOTOR DRIVES, ARRANGED FOR LUBRICATION AND SIMILAR RUNNING MAINTENANCE WITHOUT REMOVAL OF GUARDS.

END OF SECTION 200513

SECTION 200548 MECHANICAL IDENTIFICATION

PART 1.00 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND OTHER CONDITIONS AND DIVISION 1 - GENERAL REQUIREMENTS SECTIONS, APPLY TO THE WORK SPECIFIED IN THIS SECTION.

1.02 STANDARDS

- A. ANSI COMPLIANCE COMPLY WITH ANSI A13.1 FOR LETTERING SIZE, COLORS, AND INSTALLED VIEWING ANGLES OF IDENTIFICATION DEVICES.

PART 2.00 PRODUCTS

2.01 ENGRAVED PLASTIC-LAMINATE SIGNS

- A. PROVIDE ENGRAVED STOCK MELAMINE PLASTIC LAMINATE, COMPLYING WITH FS L-9-387, ENGRAVED WITH ENGRAVER'S STANDARD LETTER STYLE OF SIZES AND WORDING, BLACK WITH WHITE CORE (LETTER COLOR) EXCEPT AS OTHERWISE INDICATED, PUNCHED FOR MECHANICAL FASTENING EXCEPT WHERE ADHESIVE MOUNTING IS NECESSARY BECAUSE OF SUBSTRATE. PROVIDE 1/16" THICKNESS FOR UNITS UP TO 20 SQ. IN. OR 8" LENGTH; 1/8" FOR LARGER UNITS. PROVIDE FASTENING PER SELF-TAPPING STAINLESS STEEL SCREWS EXCEPT CONTACT-TYPE PERMANENT ADHESIVE WHERE SCREWS CANNOT OR SHOULD NOT PENETRATE SUBSTRATE. PROVIDE FOR ALL EQUIPMENT.

2.02 ELECTRICAL EQUIPMENT

- A. ON ALL MECHANICAL EQUIPMENT THAT HAS POWER CONNECTORS, PROVIDE WITH PERMANENT MARKER, THE ELECTRICAL PANEL AND BREAKER NUMBER. MARK ON DISCONNECT.

PART 3.00 - EXECUTION

3.01 MECHANICAL EQUIPMENT IDENTIFICATION

- A. MECHANICAL EQUIPMENT IDENTIFICATION INSTALL ENGRAVED PLASTIC LAMINATE SIGN ON OR NEAR EACH MAJOR ITEM OF MECHANICAL EQUIPMENT AND EACH OPERATING DEVICE. PROVIDE SIGNS FOR WATER HEATERS, FANS, HVAC UNITS AND OTHER OPERATIONAL DEVICES.

END OF SECTION 200548

SECTION 240000 COMMISSIONING:

PART 1.00 GENERAL

1. PROVIDE MECHANICAL SYSTEMS COMMISSIONING IN ACCORDANCE WITH LOCAL ENERGY CODE AND THE REQUIREMENTS OF THIS SPECIFICATION. ALL CONTROL SEQUENCES SHALL BE FUNCTIONALLY TESTED TO ENSURE THEY OPERATE IN ACCORDANCE WITH THE REQUIRED SEQUENCE.
2. HVAC UNITS: OPERATE SYSTEM IN COOLING MODE; RECORD OUTSIDE TEMPERATURE, MIXED AIR TEMPERATURE, SUPPLY AIR TEMPERATURE. WHERE ECONOMIZERS ARE SPECIFIED, DEMONSTRATE PROPER OPERATION OF CHANGEOVER FROM ECONOMIZER DAMPER OPERATION (FREE COOLING WITH OUTSIDE AIR) TO MECHANICAL COOLING (MINIMUM OUTSIDE AIR WITH COMPRESSOR COOLING). VERIFY THAT COOLING COIL SENSIBLE CAPACITY MATCHES THE TEMPERATURE DROP ON THE COOLING COIL VIA THE FORMULA COOLING CAPACITY (BTUH) = AIRFLOW (CFM) X (1.1) X DELTA T (MIXED AIR TEMP - SUPPLY AIR TEMP DEGREES F). OPERATE UNITS IN HEATING MODE; RECORD OUTSIDE AIR TEMPERATURE, MIXED AIR TEMPERATURE, SUPPLY AIR TEMPERATURE. VERIFY THAT HEATING COIL CAPACITY MATCHES THE TEMPERATURE RISE ON THE HEATING COIL VIA THE FORMULA HEATING CAPACITY (BTUH) = AIRFLOW (CFM) X (1.1) X DELTA T (MIXED AIR TEMP - SUPPLY AIR TEMP DEGREES F). VERIFY THE OPERATION OF ANY CONTROL VALVES WHERE PRESENT (CHILLED WATER OR HEATING WATER VALVES). VERIFY THAT EACH UNIT OPERATES WITH THE CORRECT THERMOSTAT/ SENSOR. UNIT FANS SHALL RUN CONTINUOUSLY DURING OCCUPIED MODE AND CYCLE ON/OFF DURING UNOCCUPIED MODE. SETUP AND VERIFY HOURS ON OPERATION (TIME SCHEDULE) FOR OCCUPIED/UNOCCUPIED MODE AND HOLIDAY/WEEKEND SCHEDULING.
3. VERIFY SMOKE DETECTOR SHUTDOWN OF ANY FAN UNITS SCHEDULED FOR SMOKE DETECTOR SHUTDOWN.
4. VERIFY PROPER OPERATION OF ANY OTHER HVAC EQUIPMENT THAT IS INTERLOCKED WITH OTHER EQUIPMENT.
5. PROVIDE CHECK OUT OF ALL PLUMBING SYSTEMS FOR PROPER OPERATION, INCLUDING HOT AND COLD WATER AT ALL FAUCETS, WATER HEATERS SET FOR PROPER TEMPERATURE, OPERATION OF ALL VALVES, GREASE TRAPS, GAS VALVES, MIXING VALVES. RECORD DATA ON ALL DEVICES CHECKED AND THE STATUS OF THEIR OPERATION.

END OF SECTION 240000

DATE: 08-14-08

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REVISIONS

MECHANICAL
SPECIFICATIONS

SHEET NUMBER

M1.2