DIVISION 20 – COMMON REQUIREMENTS FOR FIRE SUPPRESSION, PLUMBING AND HVAC
SECTION 200500 GENERAL PROVISIONS

PART 1 – GENERAL
1.01 GENERAL REQUIREMENTS

A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND OTHER CONDITIONS AND DIVISION 01 – 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. CONNECTION TO ALL UTILITIES.
3. HEATING AND AIR CONDITIONING.
4. INSULATION.
5. TEMPERATURE CONTROLS.
6. FIRE PROTECTION WORK.

1.02 DESCRIPTION OF WORK

A. EXTENT OF MECHANICAL WORK IS INDICATED ON DRAWINGS OR SPECIFIED IN DIVISIONS 20, 21, 22 AND 23 SECTIONS OF THE SPECIFICATION. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SUPERVISION AND SERVICE NECESSARY FOR COMPLETE MECHANICAL SYSTEM.

1.03 QUALITY OF 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, ETC. UNDER THIS JURISDICTION.
B. IN ADDITION, FOLLOW ALL REQUIREMENTS PERTAINING TO THE MALL TENANT DESIGN MANUAL.

1.04 SUBMITTALS

A. DIVISIONS 20, 21, 22 AND 23 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 21000.
B. SUBMIT PRIOR TO FABRICATION.
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 – PRODUCTS
2.01– MATERIALS

A. ALL MATERIALS SHALL BE NEW AND OF MANUFACTURES SPECIFIED HEREIN. THEY SHALL BE U.S. MADE (EXCEPT FOR CANADIAN COPPER PIPE IS ACCEPTABLE) AND BEAR THE U.L., ETL OR CSA LABEL WHERE POSSIBLE.
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 PRATICES.

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 DIVISIONS 20, 21, 22 AND 23 GUARANTEE THE ARTICLE OR MATERIAL SUBSTITUTED TO BE EQUAL TO OR BETTER IN EVERY RESPECT THAN THE ARTICLE OR MATERIAL SPECIFIED. DIVISIONS 20, 21, 22 AND 23 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 IS BASED ON EQUIPMENT LISTED IN EQUIPMENT SCHEDULES. ANY OTHER EQUIPMENT USED MUST FIT IN AVAILABLE SPACE WITH ALL ACCESS AND SERVICING REQUIREMENTS MAINTAINED. IT IS DIVISIONS 20, 21, 22 AND 23 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 – 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, DIVISIONS 20, 21, 22 AND 23 IS REFERRED TO THE ARCHITECTURAL, STRUCTURAL, & ELECTRICAL DRAWINGS.

3.02 CODES, ORDINANCES AND PERMITS

A. ALL WORK SHALL BE COMPLY WITH ALL APPLICABLE CODES AND ORDIANCES. TAKE OUT AND PAY FOR ALL INSPECTION FEES AND PERMITS. COMPLIANCE WITH CODES AND ORDIANCES SHALL BE AT DIVISIONS 20, 21, 22 AND 23'S EXPENSE. INCLUDE ALL CONNECTION AND PERMIT FEES IN BID. DIVISIONS 20, 21, 22 AND 23 SHALL CONTACT AHJ FOR INSPECTION OF ALL PRESSURE VESSELS IN A TIMELY MANNER BEFORE OCCUPANCY OF THE BUILDING.

3.04 TESTING

A. WATER PIPING
TEST ALL WATER PIPING SYSTEMS AT 125 PSI WATER PRESSURE AND HOLD FOR FOUR (4) HOURS. TEST IN SECTIONS BEFORE COVERING. TEST ENTIRE SYSTEM WHEN COMPLETELY INSTALLED. REPAIR ANY DEFECTS SHOWN BY TEST AND RETEST UNTIL ENTIRELY TIGHT.
B. WASTE AND SEWER PIPING
TEST ALL WASTE, SEWER AND VENT PIPING BY FILLING WITH WATER TO ROOF. HOLD FOR FOUR HOURS. TEST IN SECTIONS AS WORK PROGRESSES. REPAIR ANY DEFECTS SHOWN BY TEST AND RETEST UNTIL ENTIRELY TIGHT.
C. VALVES
TEST ALL VALVE BONNETS FOR TIGHTNESS. OPERATE ALL VALVES AT LEAST ONCE FROM CLOSED–TO–OPEN–TO–CLOSED WHILE UNDER PRESSURE.

3.05 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.

3.06 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

A. SCOPE:
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 COMMISSIONING OF SYSTEMS AND BEFORE SUBSTANTIAL COMPLETION.
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 INSNUCTIONS 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 DIVISION 20, 21, 22 AND 23 SUPPLIERS PARTICIPATING IN PROJECT.

3.07 RECORD DRAWINGS

A. PROVIDE THE ARCHITECT WITH RECORD DRAWINGS. RECORD DRAWINGS SHALL BE NEW, REPRODUCIBLE BOND, PAPER AND SHALL SHOW THE MEASURED LOCATIONS OF ALL CONCERNED PORTIONS OF THE WORK AND SHALL SHOW ALL CHANGES THE DIVISIONS 20, 21, 22 AND 23 HAVE MADE.
B. DRAWINGS MUST SHOW ALL ADDENDUM ITEMS, CHANGE ORDERS AND DEVIATIONS FROM THE PLANS

3.08 INTERFERENCE

A. DIVISIONS 20, 21, 22 AND 23 ATTENTIONS ARE 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 DIVISIONS 20, 21, 22 AND 23 SHALL INCLUDE PROVISIONS FOR SUCH IN HIS BID.
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.

3.09 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.

3.10 SEISMIC RESTRAINTS

A. ALL MECHANICAL EQUIPMENT, DUCTWORK AND PIPING SHALL BE PROVIDED WITH SEISMIC RESTRAINTS IN ACCORDANCE WITH IBC SEISMIC DESIGN CATEGORY D. DIVISIONS 20, 21, 22 AND 23 SUBCONTRACTORS SHALL HIRE (AT DIVISIONS 20, 21, 22 AND 23 EXPENSES) A LICENSED PROFESSIONAL ENGINEER IN THIS STATE TO DESIGN ANY NECESSARY ANCHORAGE, BRACING, ETC. FOR MECHANICAL COMPONENTS TO COMPLY WITH IBC SECTION 1621 AND ASCE 7–02 SECTION 9.6.3.

END OF SECTION 200500

SECTION 200513 ELECTRICAL PROVISIONS

PART 1 – GENERAL
1.01 DESCRIPTION

A. GENERAL REQUIREMENTS
DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND OTHER CONDITIONS AND DIVISION 01 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 HERIN. COMPLY WITH NATIONAL ELECTRICAL CODE (NFPA 70) FOR WORKMANSHIP AND INSTALLATION REQUIREMENTS AND TO APPLICABLE SECTIONS OF DIVISION 26, 27 AND 28 OF THE SPECIFICATIONS.

PART 2 – 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 REQUIRE 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).
B. 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.
C. PHASES AND CURRENT CHARACTERISTICS:
PROVIDE SQUIRREL–CAGE INDUCTION POLYPHASE MOTORS FOR 1 HP AND LARGER, AND PROVIDE CAPACTITOR–START SINGLE–PHASE MOTORS FOR 3/4 HP AND SMALLER, EXCEPT FOR 1/6 HP AND SMALLER MAY, AT EQUIPMENT MANUFACTURER'S OPTION, BE SPLIT–PHASE TYPE. COORDINATE CURRENT CHARACTERISTICS WITH POWER SPECIFIED IN DIVISION–26 SECTIONS, AND WITH INDIVIDUAL EQUIPMENT REQUIREMENTS SPECIFIED IN OTHER DIVISIONS 20, 21, 22 AND 23 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.
D. SERVICE FACTOR: 1.15 FOR POLYPHASE MOTORS AND 1.35 FOR SINGLE–PHASE MOTORS.

C. 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, PROVDE BEARINGS DESIGNED TO RESIST THRUST LOADING. REFER TO INDIVIDUAL SECTIONS OF DIVISIONS 20, 21, 22 AND 23 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. PROVED WEATHER–PROTECTED TYPE I FOR OUTDOOR USE TYPE II WHERE NOT HOUSED. REFER TO INDIVIDUAL SECTIONS OF DIVISIONS 20, 21, 22 AND 23 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.
F. PROVIDE MOTORS WITH MINIMUM 85% POWER FACTOR. WHERE LESS THAN 85% PROVIDE POWER FACTOR CORRECTION TO MINIMUM 90% PER ENERGY CODES.

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 WIRING

A. MOTOR STARTER MANUFACTURER
1. EXCEPT WHERE ITEM OF MECHANICAL EQUIPMENT MUST BE INTEGRALLY FURNISHED WITH MOTOR START 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 PHASE 3 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 23 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 BE FUSED.
5. EXTERNALLY OPERATED MANUAL RESET.
6. UNDER VOLTAGE RELEASE OR PROTECTION FOR EACH PHASE.

PART 3 – EXECUTION
3.01 STARTERS

A. FURNISH STARTERS AND WIRING FOR MOTORS. INSTALLATION BY DIVISION 26.

3.02 MOTORS

A. INSTALL MOTORS ON MOUNTING SYSTEMS IN ACCORDANCE WITH MOTOR MANUFACTURER'S INSTRUCTIONS, SECURELY ANCHORED TO RESIST TORQUE, DRIVE THRUSTS, AND OTHER EXTERNAL FORCES 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 WITH ALLEN SCREWS ON FLAT SURFACES OF SHAFT. UNLESS OTHERWISE 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 REMOVEABLE GUARDS FOR MOTOR DRIVES, ARRANGED FOR LUBRICATION AND SIMILAR RUNNING MAINTENANCE WITHOUT REMOVAL OF GUARDS.

END OF SECTION 200513

SECTION 200515 MECHANICAL IDENTIFICATION

PART 1 – GENERAL
1.01 GENERAL REQUIREMENTS

A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND OTHER CONDITIONS AND DIVISION 01 – GENERAL REQUIREMENTS SECTIONS, APPLY TO THE WORK SPECIFIED IN THIS SECTIONS.

1.02 STANDARDS

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

PART 2 – PRODUCTS
2.01 ENGRAVED PLASTIC–LAMINATE SIGNS

A. PROVIDE ENGRAVED STOCK MELAMINE PLASTIC LAMINATE, COMPLYING WITH FS L–P–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. PROVIE 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 – 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.

SECTION 200593 TESTING, ADJUSTING AND BALANCING (TAB)

PART 1 – GENERAL
1.01 DESCRIPTION

A. GENERAL REQUIREMENTS
DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND OTHER CONDITIONS AND DIVISION 01 – GENERAL REQUIREMENTS SECTIONS, APPLY TO THE WORK SPECIFIED IN THIS SECTION.

1.02 INDUSTRY STANDARDS

A. ALL TESTING, ADJUSTING AND BALANCING OF ALL WORK SHALL BE PERFORMED BY AN INDEPENDENT CONTRACTOR WHO IS CURRENTLY LICENSED ASSOCIATED AIR BALANCING COUNCIL (AABC) OR NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB) BALANCING CONTRACTOR. NO OTHER BALANCE REPORTS WILL BE REVIEWED OR ACCEPTED. ALL BALANCING MUST BE COMPLETE AND DONE IN ACCORDANCE WITH THE MOST RECENT STANDARDS OF THEIR SOCIETY. ALL BALANCING WORK SHALL BE PERFORMED WITH ACCORDANCE WITH LOCAL CODES AND THIS SECTION.

1.03 SUBMITTALS

A. SUBMIT CERTIFIED TEST REPORTS SIGNED BY TEST AND BALANCE SUPERVISOR WHO PERFORMED TAB WORK. SUBMIT RECORD HVAC PLAN SHOWING ALL VOLUME DAMPER & REMOTE VOLUME DAMPER OPERATOR LOCATIONS & CONNECTION LINKAGE.
B. THE BALANCE REPORT SHALL BE ON THE AABC NATIONAL STANDARD REPORT FORMS OR THE NEEB CERTIFIED REPORT FORMS AS PUBLISHED IN THEIR MOST CURRENT EDITIONS AND SHALL INCLUDE AS A MINIMUM THE FOLLOWING INFORMATION.
1. AABC OR NEBB CERTIFICATION NUMBER AND SIGNATURE OF BALANCING CONTRACTOR
2. COPY OF A CERTIFICATE OF CONFORMANCE WITH NATIONAL STANDARDS FOR THIS PROJECT
3. INSTRUMENTATION LIST WITH LAST CALIBRATION DATES.
4. MAKE AND MODEL NUMBERS OF ALL HVAC EQUIPMENT.
5. AIR CFM AND STATIC PRESSURE READINGS (DISCHARGE AND SUCTION) AS MEASURED BY PITOT TUBE DUCT TRAVERSE AT THE UNIT.
6. MOTOR NAMEPLATE DATA WITH ACTUAL FIELD VOLTAGE AND AMPERAGE READINGS FOR EACH LEG.
7. MOTOR AND FAN R.P.M.'S SHEAVE SIZES AND BELT SIZES.
8. OUTSIDE, RETURN MIXED AND SUPPLY AIR TEMPERATURES AND VOLUMES SHALL BE MEASURED AT FULL COOLING WITH MINIMUM OUTSIDE AIR. RETURN/RELIEF/SMOKE EVACUATION AIRFLOW SHALL BE BALANCED AND MEASUREMENTS RECORDED BY PILOT DUCT TRAVERSE AT FULL ECONOMIZER AND POWER EXHAUST.
9. MAKE AND MODEL NUMBERS OF ALL AIR DISTRIBUTION EQUIPMENT.
10. FINAL BALANCED AIR VOLUMES AT ALL OUTLETS (INCLUDING RETURNS WHERE DUCTED).
11. INDEXED PLAN WITH DIFFUSER AND RETURN LOCATIONS ALSO INDICATE IF DIFFUSER IS 3–WAY OR 2–WAY.
12. BALANCING DATA FOR CONDENSER WATER, CHILLED WATER OR HEATING HOT WATER SYSTEM (WHERE APPLICABLE).
C. FIVE COPIES OF THE BALANCE REPORT SHALL BE SUBMITTED TO THE OWNER FOR APPROVAL. PROVIDE ONE COPY OF APPROVED REPORT TO LANDLORD UPON COMPLETION OF CONSTRUCTION FOR THE PREMISE AS A REQUIREMENT TO OPEN FOR BUSINESS.

1.04 JOB CONDITIONS

C. WORK WILL NOT PROCEED WITH TESTING, ADJUSTING AND BALANCING WORK UNTIL WORK HAS BEEN COMPLETED AND IS OPERABLE. ENSURE THAT THERE IS NO LATENT RESIDUAL WORK STILL TO BE COMPLETED. INFORM ARCHITECT IN WRITING WHEN PROJECT IS READY FOR ADJUSTING AND BALANCING.
D. REFER TO LANDLORD TENANT CRITERIA MANUAL FOR SYSTEM BALANCING REQUIRED AS PART OF TENANT WORK

PART 2 – PRODUCTS
2.01 GENERAL

A. MECHANICAL SUB CONTRACTOR SHALL PROVIDE ALL MOTORS, SHEAVES, BELTS, LADDERS, ETC. AS REQUIRED FOR BALANCER TO ACCOMPLISH WORK.
B. BALANCING SUB CONTRACTOR SHALL BE HIRED BY THE GENERAL CONTRACTOR AT THE GENERAL CONTRACTOR'S EXPENSE. BALANCING CONTRACTOR SHALL BE AN INDEPENDENT CONTRACTOR, SEPARATE COMPANY FROM THE MECHANICAL SUB CONTRACTOR. COORDINATE WITH LANDLORD. LANDLORD MAY REQUIRE SPECIFIC CONTRACTOR FOR BALANCING.

PART 3 – EXECUTION
3.01 GENERAL

A. EXAMINE INSTALLED WORK AND CONDITIONS UNDER WHICH TESTING IS TO BE DONE TO ENSURE THAT WORK HAS BEEN COMPLETED, CLEANED AND IS OPERABLE. DO NOT PROCEED WITH TAB WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN MANNER ACCEPTABLE TO TESTER.
B. TEST, ADJUST AND BALANCE AIR CONDITIONING SYSTEMS AND COMPONENTS, AS INDICATED, IN ACCORDANCE WITH PROCEDURES OUTLINED IN APPLICABLE STANDARDS. REFER TO LANDLORD TENANT CRITERIA MANUAL FOR SYSTEM BALANCING REQUIRED AS PART OF TENANT WORK.
C. PREPARE REPORT OF TEST RESULTS IN FORMAT RECOMMENDED BY APPLICABLE STANDARDS.
D. PATCH HOLES IN INSULATION, DUCTWORK AND HOUSING, WHICH HAVE BEEN CUT OR DRILLED IN MANNER RECOMMENDED BY THE ORIGINAL INSTALLER.
E. MARK EQUIPMENT SETTINGS, INCLUDING DAMPER CONTROL POSITIONS, VALVE INDICATORS, FAN SPEED CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, TO SHOW FINAL SETTINGS AT COMPLETION OF BALANCE WORK. PROVIDE MARKINGS WITH PAINT OR OTHER SUITABLE PERMANENT IDENTIFICATION MATERIALS.
F. INITIAL BALANCING SHALL INCLUDE BALANCING ALL AIR QUANTITIES TO 10% OF THOSE LISTED ON THE DRAWINGS.
G. BALANCER SHALL THEN CHECK ALL BUILDING TEMPERATURES AND READJUST AIR QUANTITIES TO EVEN OUT SPACE TEMPERATURES TO WITHIN 1 DEG. F WITHIN SPACES.
H. TESTING, ADJUSTING AND BALANCING REPORT MUST BE COMPLETE AND TURNED OVER TO TENANT PROJECT MANAGER 1 WEEK PRIOR TO STORE TURNOVER.
I. THE HVAC SUB CONTRACTOR SHALL BE PRESENT FOR AIR BALANCE TO VERIFY ACCESSIBILITY TO ALL DEVICES, VERIFY ALL OPERATING SEQUENCES AND INSTALL NEW FILTERS IN ALL UNITS JUST PRIOR TO THE AIR BALANCE. THE COMPLETE AIR BALANCE SHALL TAKE PLACE WITH OUTSIDE AIR DAMPERS IN MINIMUM POSITION, EXCEPT AS NOTED OTHERWISE. HVAC SUB CONTRACTOR SHALL ALSO INSTALL A NEW SET OF FILTERS AFTER PROJECT IS COMPLETE.
J. BALANCE AIR TO WITHIN PLUS/MINUS 10% OF THAT INDICATED ON THE DRAWINGS. ANY REQUIRED CHANGES IN SHEAVES, BELTS, PULLEYS OR THE ADDITION OF DAMPERS REQUIRED TO ACHIEVE SPECIFIED FLOW RATES SHALL BE PERFORMED BY THE HVAC SUB CONTRACTOR WITH NO ADDITIONAL COST TO TENANT OR THE LANDLORD.
K. THE BALANCING SUB CONTRACTOR SHALL PERFORM ALL APPLICABLE TESTING AND BALANCING FUNCTIONS REQUIRED FOR THE SYSTEM DESIGNED ON THESE DRAWINGS. ALL SYSTEMS UNABLE TO BE COMPLETELY BALANCED AT THE TIME OF ORIGINAL BALANCE MUST BE BALANCED IN FUTURE AT NO ADDITIONAL EXPENSE TO THE TENANT. THE BALANCING CONTRACTOR SHALL RECHECK ANY ITEMS THAT TENANT DEEMS NECESSARY AT NO ADDITIONAL COST TO THE TENANT.
L. PROVIDE BALANCING OF NEW AND EXISTING (IF PRESENT) HVAC SYSTEMS.

END OF SECTION 200593

SECTION 200700 MECHANICAL INSULATION

PART 1 – GENERAL
1.01 GENERAL REQUIREMENTS

A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT INCLUDING GENERAL AND OTHER CONDITIONS AND DIVISION 01 – GENERAL REQUIREMENTS SECTIONS, APPLY TO THE WORK SPECIFIED IN THIS SECTION. AT A MINIMUM, INSULATION VALUES SHALL MEET THE REQUIREMENTS OF THE STATE ENERGY CODE, IF APPLICABLE.

1.02 FLAME/SMOKE RATINGS

A. PROVIDE COMPOSITE MECHANICAL INSULATION (INSULATION, JACKETS, COVERINGS, SEALER, MASTICS AND ADHESIVES) WITH FLAME SPREAD INDEX AT 25 OR LESS, AND SMOKE DEVELOPED INDEX OF 50 OR LESS, AS TESTED BY ASTM E84 (NFPA 225) METHOD.

PART 2 – PRODUCTS
2.01 MATERIALS

A. GLASS FIBER PIPE INSULATION: ASTM C 1136 & 547 TYPE I.
B. GLASS FIBER PIPE FITTING INSULATION: ASTM C 553.
C. GLASS FIBER DUCT WRAP INSULATION: ASTM C 553–92, 1290–95, 1136 & 1138–90 TYPE II

2.02 MANUFACTURERS

A. ONE OF THE FOLLOWING:
1. CERTAIN TEED CORP., KNAUF FIBER GLASS, MANVILLE CORP., OWENS–CORNING FIBERGLASS CORP., IMCOA, NOMACO.

2.03 PIPING INSULATION

A. OMIT INSULATION ON EXPOSED PLUMBING FIXTURE RUN–OUTS, (EXCEPT AT HANDICAPPED FIXTURES) FROM FACE OF WALL OR FLOOR TO FIXTURE, ON UNIONS, FLANGES, STRAINERS, FLEXIBLE CONNECTIONS, AND EXPANSION JOINTS.
1. INSULATE THE FOLLOWING COLD PIPING SYSTEMS:
A. DOMESTIC COLD WATER AND CONDENSATE DRAIN PIPING.
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