- HEATING, VENTILATING AND AIR CONDITIONING OF ALL SPACES AS SHOWN ON THE DRAWINGS DESCRIBED HEREINAFTER.
- FURNISH AND INSTALL REGISTERS AND DIFFUSERS, VOLUME DAMPERS, ETC AS REQUIRED AND INDICATED ON DRAWINGS.
 FURNISH AND INSTALL A COMPLETE LOW VELOCITY SHEET METAL DUCTWORK DISTRIBUTION SYSTEM AS SHOWN ON DRAWINGS.

- TESTING, ADJUSTING AND BALANCING OF ALL AIR SYSTEMS AND EQUIPMENT.
 INSTALL THERMOSTATS, AND INTERLOCK WIRING AS SHOWN AND AS
 DESCRIBED HEREIN.
 COORDINATE ALL DUCTWORK WITH ELECTRICAL, PLUMBING, FIRE PROTECTION AND ARCHITECTURAL DRAWINGS PRIOR TO INSTALLATION.
- ALL EQUIPMENT AND CONTROLS SHALL CONFORM WITH THE BUILDING SUBTENANT DESIGN CRITERIA & CONSTRUCTION PROCEDURES.

 ALL KITCHEN EQUIPMENT AND CONTROLS SHALL CONFORM WITH THE BUILDING SUBTENANT KITCHEN EXHAUST VENTILATION SYSTEMS DESIGN STANDARD.

 KITCHEN HOOD EXHAUST FANS AND MAKE UP AIR HANDLING UNITS

- COMPLY WITH ALL APPLICABLE FEDERAL AND STATE LAWS, AND ALL LOCAL CODES, ORDINANCES. ATORY REQUIREMENTS
- REQUEST INSPECTIONS FROM AUTHORITIES HAVING JURISDICTION, OBTAIN ALL PERMITS AND PAY FOR ALL FEES AND INSPECTION CERTIFICATES AS APPLICABLE AND/OR REQUIRED. ALL PERMITS AND CERTIFICATES SHALL BE TURNED OVER TO THE OWNERS AT THE COMPLETION OF THE WORK.
 ALL WORK, EQUIPMENT AND MATERIALS SHALL CONFORM TO THE BUILDING CONSTRUCTION RULES AND REGULATIONS.
- PROVIDE SHOP DRAWINGS FOR ALL EQUIPMENT, INCLUDING BUT NOT LIMITED TO MAKE UP AIR HANDING UNITS AND EXHAUST FANS.
 ROOF CURBS AND VENTED EXHAUST FAN ROOF CURBS.
 REGISTERS AND DIFFUSERS.
 SHEET METAL FABRICATION STANDARDS
 DUCT INSULATION.
 TEMPERATURE CONTROLS KITCHEN HOOD EXHAUST FANS & MUA-1 UNIT.

- FURNISH TO OTHER TRADES ADVANCE INFORMATION ON LOCATIONS AND SIZES OF ALL FRAMES, BOXES, SLEEVES AND OPENINGS NEEDED FOR THEIR WORK, AND ALSO FURNISH INFORMATION AND SHOP DRAWINGS NECESSARY TO PERMIT TRADES AFFECTED BY THE WORK TO INSTALL SAME PROPERLY AND WITHOUT DELAY. IF ANY HVAC WORK HAS BEEN INSTALLED BEFORE COORDINATION WITH OTHER TRADES SO AS TO CAUSE INTERFERENCE WITH THE WORK OF SUCH TRADES, ALL NECESSARY ADJUSTMENTS AND CORRECTIONS SHALL BE MADE BY THE HVAC TRADES INVOLVED WITHOUT EXTRA COST TO THE OWNERS. WORK SHALL BE PERFORMED IN COOPERATION WITH OTHER TRADES ON THE PROJECT AND SO SCHEDULED AS TO ALLOW SPEEDY AND EFFICIENT COMPLETION OF THE WORK.
- MECHANICAL AND ELECTRICAL COORDINATION PROTECT ALL MATERIALS AND WORK OF OTHER TRADES FROM DAMAGE WHICH MAY BE CAUSED BY THE HVAC WORK, AND REPAIR ALL DAMAGES WITHOUT EXTRA COST TO THE OWNERS.

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- HEATING, VENTILATING, AND AIR CONDITIONING SUBCONTRACTOR SHALL FURNISH AND INSTALL VARIOUS ELECTRICAL ITEMS RELATING TO THE HVAC EQUIPMENT AND CONTROL APPARATUS. THE ELECTRICAL SUBCONTRACTOR SHALL BE REQUIRED TO CONNECT POWER WIRING TO THIS EQUIPMENT UNLESS NOTED OTHERWISE.
- THE HVAC AND ELECTRICAL SUBCONTRACTOR SHALL COORDINATE THEIR RESPECTIVE PORTIONS OF THE WORK, AS WELL AS THE ELECTRICAL CHARACTERISTICS OF THE HVAC EQUIPMENT.

 ALL POWER WIRING AND LOCAL DISCONNECT SWITCHES WILL BE PROVIDED BY THE ELECTRICAL SUBCONTRACTOR FOR THE LINE VOLTAGE POWER. ALL CONTROL AND INTERLOCKING WIRING SHALL BE RESPONSIBILITY OF THE HVAC SUBCONTRACTOR.

 120V POWER WIRING SOURCES EXTENDED AND CONNECTED TO HEATING AND VENTILATING CONTROL ALL LOW VOLTAGE THERMOSTAT, ZONE VALVE AND ANY SWITCH WIRING SHALL BE THE RESPONSIBILITY OF THE HVAC SUBCONTRACTOR.
- INSTALLATION REQUIREMENTS ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF DIVISION 16.

 RENESSARTEANSSARMERS: ANDRINGUIFAND HASTABEED HONDER PONSOBUTION OF LICED FLEAGSECALUSUBARD TRACTOR.

 AN INTEGRAL PART OF PACKAGED EQUIPMENT. COORDINATE WITH ELECTRICAL CONTRACTOR.

1.6

THE ARRANGEMENT OF ALL HVAC WORK SHOWN ON THE DRAWINGS IS DIAGRAMMATIC ONLY AND INDICATES THE MINIMUM REQUIREMENTS OF THE WORK. CONDITIONS AT THE BUILDING INCLUDING ACTUAL MEASUREMENTS SHALL DETERMINE THE DETAILS OF THE INSTALLATION.

RECORD DRAWINGS, PROJECT CLOSEOUT

GUARANTEE/WARRANTY PROVIDE RECORD AS-BUILT DRAWINGS AT COMPLETION OF INSTALLATION.

- ALL NEW MATERIALS, ITEMS OR EQUIPMENT AND WORKMANSHIP FURNISHED UNDER THIS SECTION SHALL CARRY STANDARD WARRANTY AGAINST ALL DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF NOT LESS THAN ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE OF WORK. ANY FAULT DUE TO DEFECTIVE OR IMPROPER MATERIAL, EQUIPMENT, WORKMANSHIP OR MANUFACTURING DESIGN WHICH MAY DEVELOP WITHIN THAT PERIOD SHALL BE MADE GOOD, FORTHWITH, BY AND AT THE EXPENSE OF THIS CONTRACTOR, INCLUDING ALL OTHER DAMAGES DONE TO AREAS, MATERIALS AND OTHER SYSTEMS RESULTING FROM THIS FAILURE.
- THIS CONTRACTOR SHALL GUARANTEE THAT ALL NEW ELEMENTS OF THE SYSTEMS MEET THE SPECIFIED PERFORMANCE REQUIREMENTS AS SET FORTH HEREIN OR AS INDICATED ON THE DRAWINGS.

- GALVANIZED STEEL SHEETS, REINFORCING AND COMPANION ANGLES, HANGERS, METAL SPECIFICATIONS, GAUGES AND CONSTRUCTION OF SEAMS, JOINTS AND REINFORCING SHALL BE ACCORDING TO THE LATEST SMACNA PUBLICATION "HVAC DUCT CONSTRUCTION STANDARDS". ALL RECTANGULAR SHEET DEFINED AS ALL DUCTWORK, UNLESS OTHERWISE SPECIFIED, SHALL BE CONSTRUCTED WITH PITTSBURGH LONGITUDINAL SEAMS. TRANSVERSE JOINTS SHALL BE MADE UP WITH POCKET LOCKS AND CORNER CLOSURES.

 THE DUCTWORK SHALL BE CONSTRUCTED OF HOT DIPPED GALVANIZED STEEL WITH G-90 COATING.
- VOLUME DAMPERS
- FURNISH AND INSTALL MANUAL VOLUME DAMPERS WHERE INDICATED ON THE DRAWINGS AND WHERE REQUIRED. DAMPERS SHALL BE NOT LESS THAN TWO GAUGES HEAVIER THAN DUCTWORK IN WHICH INSTALLED.

DUCT SEALING

- ALL TRANSVERSE SEAMS, JOINTS AND WHERE DUCTS CONNECT SHALL BE MADE AIR TIGHT BY GENEROUSLY COATING WITH DUCT SEALANT AS MANUFACTURED BY MINNESOTA MINING AND MANUFACTURING, DOW CORNING, BOSTIK OR APPROVED EQUAL. THE MAXIMUM ALLOWABLE DUCT LEAKAGE SHALL BE 5% OF AIR QUANTITY. THE RESPECTIVE SYSTEM TOTAL
- ACOUSTICAL LINER
- THE ACOUSTICAL LINER SHALL BE MANUFACTURED BY KNAFF, CERTIAN—TEED, JOHNS MANVILLE OR APPROVED EQUAL.

 THE ACOUSTICAL LINER SHALL BE INSTALLED IN ACCORDANCE WITH THE UNIT MANUFACTURER RECOMMENDATIONS. THE FIRST 15 FOOT OF SUPPLY AND RETURN DUCTWORK FROM ALL THE ROOF TOP UNITS SHALL BE LINED WITH 1/2" ACOUSTICAL LINER.

 THE FIRST 15 FOOT OF SUPPLY DUCTWORK FROM THE MAKE UP AIR HANDLING UNIT SHALL BE LINED WITH 1/2" ACOUSTICAL LINER.

C. ALL KITCHEN EXHAUST DUCTWORK SHALL BE CONSTRUCTED OF AND SUPPORTED BY CARBON STEEL NOT LESS THAN .054 IN. (NO. 16 MSG) OR STAINLESS STEEL NOT LESS THAN .043 IN. (NO. 18 MSG) IN THICKNESS. EXPOSED DUCTWORK SHALL BE STAINLESS TO RESIST CORROSION UNLESS MATERIAL IS STAINLESS STEEL. B. ALL WORK AND MATERIALS SHALL CONFORM TO OF COMMERCIAL COOKING OPERATIONS) NFPA 96 (VENTILATION CONTROL AND FIRE PROTECTION

2.3 DUCT INSULATION

B. APPLY INSULATION AFTER SYSTEMS HAVE BEEN TESTED, PROVED TIGHT AND APPROVED BY ARCHITECT. REMOVE DIRT, SCALE, OIL, RUST AND OTHER FOREIGN MATTER PRIOR TO INSTALLATION OF INSULATION. C. LEAKS IN VAPOR BARRIER OR VOIDS IN INSULATION WILL NOT BE ACCEPTED.

D. ASTM E-84 MINIMUM FIRE HAZARD RATINGS SHALL BE 25 FLAME-SPREAD, 50 FUEL CONTRIBUTED 50 SMOKE DEVELOPED.

E. WHERE DUCTS ARE INSULATED, FLEXIBLE CONNECTIONS TO DUCTS SHALL BE INSULATED.

G. INSULATION SHALL BE CONTINUOUS THROUGH WALL AND CEILING OPENINGS AND IN SLEEVES.

A. THE KITCHEN HOOD EXHAUST DUCTWORK SHALL BE WRAPPED WITH NELSON FIRE EQUAL) TO PROVIDE A MINIMUM OF TWO HOUR RATING (MINIMUM TWO INCHES).

2.4 REGISTERS, GRILLES, AND DIFFUSERS

B. EQUIPMENT SHALL BE AS MANUFACTURED BY TITUS, KREUGER OR APPROVED EQUAL.

D. ALL REGISTERS, GRILLES AND DIFFUSERS SHALL BLADE VOLUME CONTROL DAMPERS.

A. GENERAL

- MAKE-UP AIR UNIT SHALL BE AS MANUFACTURED BY CAPTIVE AIRE OR APPROVED EQUAL PROVIDED ALL SPECIFICATIONS ARE MET. CAPTIVE AIRE MODEL TTA120A400 EQUIPMENT IS USED AS THE BASIS OF DESIGN. PERFORMANCE TO BE AS SCHEDULED ON PLANS. MAKE-UP AIR UNIT SHALL BE ETL LISTED TO ANSI Z83.4.

KITCHEN HOOD UPBLAST EXHAUST FAN.

- A. ROOF EXHAUST FANS SHALL BE UPBLAST CENTRIFUCAL CENTRIFUGAL BACKWARD INCLINED, CONSTRUCTED CAREFULLY MATCHED TO THE INLET CONE FOR INTERPOLATION OF ADDED STRENGTH AND SHALL BE JOIN CONTINUOUSLY WELDED SEAM. RIFUGAL BELT DRIVEN TYPE. THE FAN WHEEL SHALL BE CITED OF ALUMINUM AND SHALL INCLUDE A WHEEL CONE OF PRECISE RUNNING TOLERANCES. WHEELS SHALL BE FAN HOUSING SHALL BE CONSTRUCTED OF HEAVY IPPORT STRUCTURE. WINDBANDS SHALL HAVE A ROLLED JOINED TO CURBCAPS WITH A LEAKPROOF,

- G. THE EXHAUST FAN SHALL BE SUPPLIED WITH
- VENTED ROOF CURB.

D. ALL DUCTWORK SEAMS AND JOINTS SHALL BE WELDED LIQUID TIGHT.

E. ADEQUATE ACCESS FOR CLEANING SHALL BE PROVIDED ON EACH FLOOR. DUCT ACCESS PANELS SHALL BE OF THE SAME MATERIAL AND THICKNESS AS THE DUCT. ACCESS PANELS SHALL HAVE A GASKET OR SEALANT THAT IS RATED FOR 1500°F.

F. INSULATE STANDING SEAMS WITH SAME MATERIAL AND THICKNESS AS DUCT.

H. TRANSMISSION RATES OF VAPOR BARRIERS SHALL NOT EXCEED 0.02 PERMS.

2. RECTANGULAR AND CIRCULAR DUCTWORK.

B. INSULATION DENSITY SHALL BE 3/4 LB. PER CUBIC FOOT AND MAXIMUM K-FACTOR SHALL BE 0.30 AT 75°F MEAN TEMPERATURE. A. INSULATE ALL SUPPLY AIR DUCTS IN CONCEALED WITH FOIL-KRAFT FLAME-RESISTANT VAPOR BARRIER. SPACES WITH 1-1/2" THICK FIBERGLASS DUCT WRAP

C. COVER BREAKS IN VAPOR MATERIAL WITH PATCHES OF SAME MATERIAL, SECURED WITH ADHESIVE AND STAPLES. SEAL STAPLES WITH MATCHING FOIL FACE TAPE.

3. KITCHEN HOOD EXHAUST DUCTWORK.

(OR APPROVED

A. REGISTERS, GRILLES AND DIFFUSERS SHALL BE CAPACITY SCHEDULED ON THE DRAWINGS.

C. FINISH & STYLES TO CONFORM WITH BUILDING

2.5 MAKE UP AIR HANDLING UNIT

- SUPPLY AIR HANDLER WITH DX COOLING COIL AND DEHUMIDIFICATION SECTION TO SUPPLY $1950~\mathrm{CFM}$ AT 0.75" E.S.P.
- UNIT TO BE CONSTRUCTED OF 20 GA. GALVALUME METAL WITH REMOVEABLE ACCESS PANELS ON A 12 GA BASE. BASE TO INCORPORATE A CURB CAP DESIGNED TO FIT OVER THE FACTORY PROVIDED FULL PERIMETER ROOF CURB. CABINET TO BE FULLY INSULATED WITH DOUBLE WALL ROOF AND FLOOR.
- PROVIDE SINGLE POINT POWER CONNECTION. POWER SUPPLY TO BE 460/3/60. MOTOR REQUIREMENTS. PROVIDE IEC STYLE MOTOR TO BE OPEN DRIP PROOF, MEETING EPACT EFFICIENCY STARTER INSTALLED AND WIRED.
- BLOWERS TO BE CLASS I
 FORWARD CURVED ON COMMON SHAFT WITH HEAVY DUTY BEARINGS, ADJUSTABLE MOTOR SHEAVE.
 CONTRACTOR TO REPLACE ADJUSTABLE SHEAVE WITH FIXED PULLEY ONCE THE AIR BALANCE IS COMPLETED.
 PROVIDE FILTERS (30% EFFICIENT), DISPOSABLE IN V BANK FILTER SECTION. PROVIDE OUTSIDE AIR DAMPER (SHUT-OFF) WITH LINKAGE AND TWO POSITION ACTUATOR.

- B. MOTORS SHALL BE HEAVY DUTY BALL BEARING TYPE, FURNISHED AT THE SPECIFIED VOLTAGE, PHASE AI MOUNTED ON VIBRATION ISOLATORS, OUT OF THE BE DRAWN INTO THE MOTOR COMPARTMENT FROM MOTORS SHALL BE READILY ACCESSIBLE FOR MAIL CONSTRUCTED OF HEAVY GAUGE STEEL AND MOUI
- PRECISION GROUND AND POLISHED FAN SHAFTS LUBRICATED PILLOW BLOCK BALL BEARINGS. ELIFE IN EXCESS OF 200,000 HOURS AT MAXII SIZED FOR A MINIMUM OF 150% OF DRIVEN I MACHINED CAST IRON TYPE, KEYED AND SECU SHALL BE MOUNTED IN PERMANENTLY SEALED,
 BEARINGS SHALL BE SELECTED FOR A MINIMUM (L50)
 IMUM CATALOGED OPERATING SPEED. DRIVES SHALL BE
 HORSEPOWER. PULLEYS SHALL BE OF THE FULLY
 JURELY ATTACHED TO THE WHEEL AND MOTOR SHAFTS.
- F. FANS SHALL BE MODEL CUBE AS MANUFACTURED APPROVED EQUAL. BY CAPTIVE AIRE, TWIN CITY FANS COMPANY, COOK OR

- A. MAKE UP AIR UNIT (MUA-1) AND EXHAUST FAN (EF-1) SHALL ALL BE INTERLOCKED TO A SWITCH LOCATED IN THE KITCHEN AREA WHERE INDICATED ON MECHANICAL PLANS.
- WHEN THE SWITCH FOR MUA-1 AND EF-1 IS TURNED ON AND MUA-1 SHALL BE CONTROLLED BY TOUCH SCREEN PROGRAMMABLE THERMOSTATS. THE THERMOSTATS SHALL BE SET TO DESIRED TEMPERATURE.
- DURING THE HEATING SEASONS, THE THERMOSTAT SHALL BE IN HEATING MODE, AND BE INTERLOCKED THE FURNACE LOCATED IN MUA-1. DISCHARGE TEMPERATURE SHALL BE ADJUSTABLE AT THE PROGRAMMABLE THERMOSTAT CONTROLLING MUA-1.

PART 3 TESTING AND CLOSEOUT

- UPON COMPLETION ALL SHEETMETAL WORK SPECIFIED UNDER THIS SECTION IS TO BE CLEANED. ALL EQUIPMENT IS TO BE CLEANED, ALL TRIM INSTALLED, ALL PROTECTIVE OIL, TAPE OR OTHER MATERIALS USED TO PROTECT WORK ARE TO BE REMOVED.
- OPERATING AND MAINTENANCE INSTRUCTIONS

- SCAFFOLDS SHALL HAVE SOLID BACKS AND FLOORS TO PREVENT DROPPING MATERIALS THERE FROM TO THE FLOORS OR GROUND.

PROVIDE THE FOLLOWING:

- EQUIPMENT IS OPERABLE AND IN A SAFE AND NORMAL CONDITION.

 TEMPERATURE CONTROL SYSTEMS ARE INSTALLED COMPLETE AND OPERABLE.
- PROPER THERMAL OVERLOAD PROTECTION IS IN PLACE FOR ELECTRICAL EQUIPMENT.
- DUCT SYSTEMS ARE CLEAN OF DEBRIS.
- CORRECT FAN ROTATION.
- AIR OUTLETS ARE INSTALLED AND CONNECTED.
- REPORT ANY DEFECTS OR DEFICIENCIES NOTED DURING PERFORMANCE OF SERVICES TO THE ARCHITECT.
- PROMPTLY REPORT ABNORMAL CONDITIONS IN MECHANICAL SYSTEMS OR CONDITIONS WHICH PREVENT SYSTEM BALANCE.
- IF, FOR DESIGN REASONS, SYSTEM CANNOT BE PROPERLY BALANCED, REPORT AS SOON AS OBSERVED.
- AFTER ADJUSTMENT, TAKE MEASUREMENTS TO VERIFY BALANCE HAS NOT BEEN DISRUPTED OR THAT SUCH DISRUPTION HAS BEEN RECTIFIED. RECORDED DATA SHALL REPRESENT ACTUALLY MEASURED, OR OBSERVED CONDITION.
- LEAVE SYSTEMS IN PROPER WORKING ORDER, REPLACING BELT GUARDS, CLOSING ACCESS DOORS, CLOSING DOORS TO ELECTRICAL SWITCH BOXES, AND RESTORING THERMOSTATS TO SPECIFIED SETTINGS.
- = ADJUST AIR HANDLING AND DISTRIBUTION SYSTEMS TO PROVIDE REQUIRED OR DESIGN SUPPLY, RETURN, AND EXHAUST AIR QUANTITIES.
- 12. MAKE AIR QUANTITY MEASUREMENTS IN DUCTS BY PILOT TUBE TRAVERSE OF ENTIRE CROSS SECTIONAL AREA OF DUCT.
- 13. MEASURE AIR QUANTITIES AT AIR INLETS AND OUTLETS.
- <u>1</u>6. WEASURE STATIC AIR PRESSURE CONDITIONS ON AIR SUPPLY UNITS, INCLUDING FILTER AND COIL PRESSURE DROPS, AND TOTAL PRESSURE ACROSS THE FAN. MAKE ALLOWANCES FOR 50% LOADING OF FILTERS.
- ADJUST OUTSIDE AIR AUTOMATIC DAMPERS, OUTSIDE AIR, RETURN AIR, AND EXHAUST DAMPERS FOR DESIGN CONDITIONS.

- ALL MECHANICAL EQUIPMENT BEING ADDED (EXHAUST FANS, MAKE UP AIR UNITS, ETC.) SHALL BE MONITORED BY THE BUILDING DDC SYSTEM.

EXECUTION

- ALL DUCTS, FANS, AND EQUIPMENT SHALL BE THOROUGHLY CLEANED INSIDE AND OUTSIDE AND BLOWN OUT TO PREVENT ANY DEBRIS FROM DAMAGING FAN SHIELDS OR DEBRIS HANGING THROUGH REGISTERS OR DIFFUSERS WHEN SYSTEMS ARE PLACED IN OPERATION. ALL TEMPORARY CONNECTIONS REQUIRED FOR BLOWING OUT THE SYSTEMS, CHEESECLOTH FOR ALL DUCT OPENINGS, AND ANY OTHER EQUIPMENT OR LABOR FOR CLEANING, SHALL BE PROVIDED BY THE HVAC CONTRACTOR. THE ENTIRE HVAC SYSTEM SHALL BE KEPT CLEAN UNTIL FINAL ACCEPTANCE. ANY DAMAGE TO CEILINGS BY THE HVAC CONTRACTOR SHALL BE RECTIFIED BY THE HVAC CONTRACTOR SHALL BE RECTIFIED BY THE HVAC CONTRACTOR SHALL BE RECTIFIED BY THE MALL BE RECTIFIED BY THE HVAC CONTRACTOR SHALL BE RECTIFIED BY THE HVAC CONTRACTOR SHALL BE RECTIFIED BY THE HVAC CONTRACTOR SHALL BE RECTIFIED BY THE MALL BY THE
- PRIOR TO COMPLETION OF THE CONTRACT, PROVIDE FIELD AND WRITTEN OPERATING INSTRUCTIONS TO THE OWNER'S DESIGNATED REPRESENTATIVE WITH RESPECT TO OPERATION FUNCTIONS AND MAINTENANCE PROCEDURES FOR ALL EQUIPMENT AND SYSTEMS INSTALLED.
- OPERATING EQUIPMENT INSTALLED UNDER THIS SECTION SHALL BE PLACED IN OPERATION AND SHALL NCTION CONTINUOUSLY IN AN OPERATING TEST FOR A PERIOD OF THREE DAYS, WITHOUT SHUTDOWN DUE TO CHANICAL FAILURE OR NECESSITY OF ADJUSTMENT. PRIOR TO SCHEDULING THE PROJECT FINAL PROTECTION AND AFTER COMPLETION OF ALL INSTALLATION AND RUNNING EQUIPMENT AND AUTOMATIC NITHOUT ADJUSTMENTS, PERFORM AIR BALANCING AND ANY OTHER WORK REQUIRED TO PLACE THE UPPERATING CONDITION TO MEET ALL REQUIREMENTS UNDER THIS SPECIFICATION. RING THIS RUNNING TEST PERIOD, DELIVER TO THE DESIGNER TWO COMPLETE SETS OF OPERATING, NITENANCE AND REPLACEMENT DATA FOR ALL EQUIPMENT WHICH WILL REQUIRE OPERATING TRUCTION OF THE OPERATING ALL EQUIPMENT WHICH WILL REQUIRE OPERATING THE SIGNER. DURING THE OPERATING THE OPERATION SHALL BE AVAILABLE DURING THE AVAILABLE FOR GIVING FIELD INSTRUCTION SHALL COVER OPERATION, MAINTENANCE AND ADJUSTMENT OF EQUIPMENT INSTALLED.
- HOISTING, SCAFFOLDING, STAGING, AND PLANKING
- PROVIDE, SET-UP AND MAINTAIN ALL REQUIRED DERRICKS, HOISTING MACHINERY, SCAFFOLDS AND STAGING, PLANKING AND PERFORM ALL HOISTING REQUIRED TO COMPLETE THE WORK OF THIS FILED SUB-BID AS INDICATED AND SPECIFIED.
- TESTING AND BALANCING
- TOTAL SYSTEM BALANCE SHALL BE PERFORMED IN ACCORDANCE WITH AABC NATIONAL STANDARDS FIELD MEASUREMENT AND INSTRUMENTATION, TOTAL SYSTEM BALANCE OR ASHRAE SYSTEMS HANDBOOK.
- BEFORE COMMENCING WORK, VERIFY THAT SYSTEMS ARE COMPLETE AND OPERABLE. ENSURE THE FOLLOWING:
- FILTERS ARE CLEAN AND IN PLACE. IF REQUIRED, ADDITION TO FINAL FILTERS.

- FIRE AND VOLUME DAMPERS ARE IN PLACE AND OPEN.
- ACCESS DOORS ARE CLOSED AND DUCT END CAPS ARE IN PLACE
- (10) DUCT SYSTEM LEAKAGE HAS BEEN MINIMIZED.

- START OF WORK MEANS ACCEPTANCE OF EXISTING CONDITIONS. PROVIDE ADDITIONAL BALANCING DEVICES AS REQUIRED.
- 10. AT FINAL INSPECTION, RECHECK RANDOM SELECTIONS OF DATA RECORDED IN REPORT. RECHECK POINTS OR AREAS AS SELECTED AND WITNESSED BY THE OWNER.

- 15. ADJUST DISTRIBUTION SYSTEM TO OBTAIN UNIFORM SPACE TEMPERATURES FREE FROM OBJECTIONABLE DRAFTS AND NOISE. USE VOLUME CONTROL DEVICES TO REGULATE AIR QUANTITIES ONLY TO EXTENT THAT ADJUSTMENTS DO NOT CREATE OBJECTIONABLE AIR MOTION OR SOUND LEVELS. EFFECT VOLUME CONTROL BY DUCT INTERNAL DEVICES SUCH AS DAMPERS.
- MEASURE TEMPERATURE CONDITIONS ACROSS OUTSIDE AIR, RETURN AIR, AND EXHAUST DAMPERS TO CHECK LEAKAGE.

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No.: 07417 As Noted

Mechanical

Issued: 12/11/07