

15A: Heating, Ventilating, and Air Conditioning:

15A GENERAL INSTRUCTIONS

15A GENERAL REQUIREMENTS

REQUIREMENTS UNDER DIVISION ONE AND THE GENERAL AND SUPPLEMENTARY CONDITIONS OF THESE SPECIFICATIONS SHALL BE A PART OF THIS SECTION. CONTRACTOR SHALL BECOME THOROUGHLY ACQUAINTED WITH ITS CONTENTS AS TO REQUIREMENTS THAT AFFECT THIS DIVISION OR SECTION.

THE SPECIFICATIONS AND DRAWINGS FOR THE PROJECT ARE COMPLEMENTARY, AND PORTIONS OF THE WORK DESCRIBED IN ONE SHALL BE PROVIDED AS IF DESCRIBED IN BOTH. IN THE EVENT OF DISCREPANCIES, NOTIFY THE ENGINEER AND REQUEST CLARIFICATION PRIOR TO PROCEEDING WITH THE WORK INVOLVED.

15A DEFINITIONS

FURNISH: THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION AND SIMILAR OPERATIONS."

INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT THE PROJECT SITE INCLUDING THE ACTUAL UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."

PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

FURNISHED BY OWNER OR FURNISHED BY OTHERS: THE ITEM WILL BE FURNISHED BY THE OWNER OR OTHERS. IT IS TO BE INSTALLED AND CONNECTED UNDER THE REQUIREMENTS OF THIS DIVISION, COMPLETE AND READY FOR OPERATION.

ENGINEER: WHERE REFERENCED IN THIS DIVISION, "ENGINEER" IS THE ENGINEER OF RECORD AND THE DESIGN PROFESSIONAL FOR THE WORK UNDER THIS DIVISION, AND IS A CONSULTANT TO, AND AN AUTHORIZED REPRESENTATIVE OF, THE ARCHITECT, AS DEFINED IN THE GENERAL AND/OR SUPPLEMENTARY CONDITIONS. WHEN USED IN THIS DIVISION, IT MEANS INCREASED INVOLVEMENT BY, AND OBLIGATIONS TO, THE ENGINEER, IN ADDITION TO INVOLVEMENT BY, AND OBLIGATIONS TO, THE "ARCHITECT".

AHJ: THE LOCAL CODE AND/OR INSPECTION AGENCY (AUTHORITY) HAVING JURISDICTION OVER THE WORK.

THE TERMS "APPROVED EQUAL," "EQUIVALENT" OR "EQUAL" ARE USED SPONTANEOUSLY AND SHALL MEAN "ACCEPTED" BY OR ACCEPTABLE TO THE ENGINEER AS EQUIVALENT TO THE ITEM OR MANUFACTURER SPECIFIED, THE TERM "APPROVED" SHALL MEAN LABELED, LISTED, OR BOTH, BY A NATIONALLY RECOGNIZED TESTING LABORATORY (E.G. UL, ETL, CSA), AND ACCEPTABLE TO THE AHJ OVER THIS PROJECT.

15A PREBID SITE VISIT

PRIOR TO SUBMITTING BID, VISIT THE SITE OF THE PROPOSED WORK AND BECOME FULLY INFORMED AS TO THE CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. FAILURE TO DO SO WILL NOT BE CONSIDERED SUFFICIENT JUSTIFICATION TO REQUEST OR OBTAIN EXTRA COMPENSATION OVER AND ABOVE THE CONTRACT PRICE.

15A MATERIAL AND WORKMANSHIP

PROVIDE NEW MATERIAL, EQUIPMENT, AND APPARATUS UNDER THIS CONTRACT UNLESS OTHERWISE STATED HEREIN, OF BEST QUALITY NORMALLY USED FOR THE PURPOSE IN GOOD COMMERCIAL PRACTICE, AND FREE FROM DEFECTS. MODEL NUMBERS LISTED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS ARE NOT NECESSARILY INTENDED TO DESIGNATE THE REQUIRED TRIM, WRITTEN DESCRIPTIONS OF THE TRIM GOVERN MODEL NUMBERS.

PIPE, PIPE FITTINGS, PIPE SPECIALTIES AND VALVES SHALL BE MANUFACTURED IN PLANTS LOCATED IN THE UNITED STATES.

WORK PERFORMED UNDER THIS CONTRACT SHALL PROVIDE A NEAT AND WORKMANLIKE APPEARANCE WHEN COMPLETED, TO THE SATISFACTION OF THE ARCHITECT AND ENGINEER. WORKMANSHIP SHALL BE THE FINEST POSSIBLE BY EXPERIENCED MECHANICS. INSTALLATIONS SHALL COMPLY WITH APPLICABLE CODES AND LAWS.

THE COMPLETE INSTALLATION SHALL FUNCTION AS DESIGNED AND INTENDED WITH RESPECT TO EFFICIENCY, CAPACITY, NOISE LEVEL, ETC. ABNORMAL NOISE CAUSED BY RATTLING EQUIPMENT, PIPING, DUCTS, AIR DEVICES, AND SQUEAKS IN ROTATING COMPONENTS WILL NOT BE ACCEPTABLE. IN GENERAL, MATERIALS AND EQUIPMENT SHALL BE OF COMMERCIAL SPECIFICATION GRADE IN QUALITY. LIGHT DUTY AND RESIDENTIAL TYPE EQUIPMENT WILL NOT BE ACCEPTED.

REMOVE FROM THE PREMISES WASTE MATERIAL PRESENT AS A RESULT OF WORK, INCLUDING CARTONS, CRATING, PAPER, STICKERS, AND/OR EXCAVATION MATERIAL NOT USED IN BACKFILLING, ETC. CLEAN EQUIPMENT INSTALLED UNDER THIS CONTRACT TO PRESENT A NEAT AND CLEAN INSTALLATION AT THE TERMINATION OF THE WORK.

REPAIR OR REPLACE PUBLIC AND PRIVATE PROPERTY DAMAGED AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT TO THE SATISFACTION OF AUTHORITIES AND REGULATIONS HAVING JURISDICTION.

15A COORDINATION

COORDINATE WORK WITH THAT OF OTHER TRADES SO THAT THE VARIOUS COMPONENTS OF THE SYSTEMS WILL BE INSTALLED AT THE PROPER TIME, WILL FIT THE AVAILABLE SPACE, AND WILL ALLOW PROPER SERVICE ACCESS TO THOSE ITEMS REQUIRING MAINTENANCE. COMPONENTS WHICH ARE INSTALLED WITHOUT REGARD TO THE ABOVE SHALL BE RELOCATED AT NO ADDITIONAL COST TO THE OWNER.

UNLESS OTHERWISE INDICATED, THE GENERAL CONTRACTOR WILL PROVIDE CHASES AND OPENINGS IN BUILDING CONSTRUCTION REQUIRED FOR INSTALLATION OF THE SYSTEMS SPECIFIED HEREIN. CONTRACTOR SHALL FURNISH THE GENERAL CONTRACTOR WITH INFORMATION WHERE CHASES AND OPENINGS ARE REQUIRED. KEEP INFORMED AS TO THE WORK OF OTHER TRADES ENGAGED IN THE CONSTRUCTION OF THE PROJECT, AND EXECUTE WORK IN A MANNER AS TO NOT INTERFERE WITH OR DELAY THE WORK OF OTHER TRADES.

FIGURED DIMENSIONS SHALL BE TAKEN IN PREFERENCE TO SCALE DIMENSIONS. CONTRACTOR SHALL TAKE HIS OWN MEASUREMENTS AT THE BUILDING, AS VARIATIONS MAY OCCUR. CONTRACTOR WILL BE HELD RESPONSIBLE FOR ERRORS THAT COULD HAVE BEEN AVOIDED BY PROPER CHECKING AND INSPECTION.

PROVIDE MATERIALS WITH TRIM THAT WILL PROPERLY FIT THE TYPES OF CEILING, WALL, OR FLOOR FINISHES ACTUALLY INSTALLED. MODEL NUMBERS LISTED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS ARE NOT INTENDED TO DESIGNATE THE REQUIRED TRIM.

15A ORDINANCES AND CODES

WORK PERFORMED UNDER THIS CONTRACT SHALL, AT A MINIMUM, BE IN CONFORMANCE WITH APPLICABLE NATIONAL, STATE AND LOCAL CODES HAVING JURISDICTION. EQUIPMENT FURNISHED AND ASSOCIATED INSTALLATION WORK PERFORMED UNDER THIS CONTRACT SHALL BE IN STRICT COMPLIANCE WITH CURRENT APPLICABLE CODES ADOPTED BY THE LOCAL AHJ INCLUDING ANY AMENDMENTS AND STANDARDS AS SET FORTH BY THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), UNDERWRITERS LABORATORIES (UL), OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME), AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS (ASHRAE), AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), AMERICAN SOCIETY OF TESTING MATERIALS (ASTM) AND OTHER NATIONAL STANDARDS AND CODES WHERE APPLICABLE. WHERE THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THE REFERENCED CODES, STANDARDS, ETC., THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE.

PROCURE AND PAY FOR PERMITS AND LICENSES REQUIRED FOR THE ACCOMPLISHMENT OF THE WORK HEREIN DESCRIBED. WHERE REQUIRED, OBTAIN, PAY FOR AND FURNISH CERTIFICATES OF INSPECTION TO OWNER. CONTRACTOR WILL BE HELD RESPONSIBLE FOR VIOLATIONS OF THE LAW.

15A PROTECTION OF EQUIPMENT AND MATERIALS

STORE AND PROTECT FROM DAMAGE EQUIPMENT AND MATERIALS DELIVERED TO JOB SITE. COVER WITH WATERPROOF, TEAR-RESISTANT, HEAVY TARP OR POLYETHYLENE PLASTIC AS REQUIRED TO PROTECT FROM PLASTER, DIRT, PAINT, WATER, OR PHYSICAL DAMAGE. EQUIPMENT AND MATERIAL THAT HAS BEEN DAMAGED BY CONSTRUCTION ACTIVITIES WILL BE REJECTED, AND CONTRACTOR IS OBLIGATED TO FURNISH NEW EQUIPMENT AND MATERIAL OF A LIKE KIND.

KEEP PREMISES BROOM CLEAN FROM FOREIGN MATERIAL CREATED DURING WORK PERFORMED UNDER THIS CONTRACT. PIPING, EQUIPMENT, ETC. SHALL HAVE A NEAT AND CLEAN APPEARANCE AT THE TERMINATION OF THE WORK.

PLUG OR CAP OPEN ENDS OF DUCTWORK AND PIPING SYSTEMS WHILE STORED AND INSTALLED DURING CONSTRUCTION WHEN NOT IN USE TO PREVENT THE ENTRANCE OF DEBRIS INTO THE SYSTEMS.

15A SUBSTITUTIONS

THE BASE BID SHALL INCLUDE ONLY THE PRODUCTS FROM MANUFACTURERS SPECIFICALLY NAMED IN THE DRAWINGS. ANY SUBSTITUTIONS OR ALTERATIONS WILL BE CONSIDERED PRIOR TO RECEIPT OF BIDS UNLESS WRITTEN REQUEST FOR APPROVAL TO BID HAS BEEN RECEIVED BY THE ENGINEER AT LEAST TEN CALENDAR DAYS PRIOR TO THE DATE FOR RECEIPT OF BIDS. EACH SUCH REQUEST SHALL INCLUDE THE NAME OF THE MATERIAL OR EQUIPMENT FOR WHICH IT IS TO BE SUBSTITUTED AND A COMPLETE LIST OF THE PROPOSED SUBSTITUTE INCLUDING DRAWINGS, CUTS, PERFORMANCE AND TEST DATA AND OTHER INFORMATION NECESSARY FOR AN EVALUATION. A STATEMENT SETTING FORTH CHANGES IN OTHER MATERIALS, EQUIPMENT OR OTHER WORK THAT INCORPORATION OF THE SUBSTITUTE WOULD REQUIRE SHALL BE INCLUDED. THE BURDEN OF PROOF OF THE MERIT OF THE PROPOSED SUBSTITUTE IS UPON THE PROPOSER. THE ENGINEER'S DECISION OF APPROVAL OR DISAPPROVAL TO BID OF A PROPOSED SUBSTITUTE SHALL BE FINAL.

THE TERMS "APPROVED," "APPROVED EQUAL," AND "EQUAL" REFER TO APPROVAL BY THE ENGINEER AS AN ACCEPTABLE ALTERNATE BID. NO SUBSTITUTIONS WILL BE CONSIDERED THAT ARE NOT BID AS AN ALTERNATE. NO MATERIAL SUBSTITUTIONS SHALL BE CONSIDERED FOR APPROVAL PRIOR TO AWARD OF CONTRACT.

COORDINATE AND VERIFY WITH OTHER TRADES WHETHER OR NOT THE SUBSTITUTED EQUIPMENT CAN BE INSTALLED AS SHOWN ON THE CONSTRUCTION DRAWINGS WITHOUT MODIFICATION TO ASSOCIATED SYSTEMS OR ARCHITECTURAL OR ENGINEERING DESIGN. INCLUDE ADDITIONAL COSTS FOR ARCHITECTURAL AND ENGINEERING DESIGN FEES IN BID IF DRAWING MODIFICATIONS ARE REQUIRED BECAUSE OF SUBSTITUTED EQUIPMENT.

15A SHOP DRAWINGS

UPON BEING AWARDED A CONTRACT, SUBMIT TO THE ARCHITECT FOR APPROVAL, SIX (6) COPIES OF MANUFACTURER'S SHOP DRAWINGS FOR EQUIPMENT TO BE FURNISHED UNDER THIS CONTRACT, ITEMS REQUIRING COORDINATION BETWEEN CONTRACTORS AND SHEET METAL DUCTWORK FABRICATION DRAWINGS. BEFORE SUBMITTING SHOP DRAWINGS AND MATERIAL LISTS, THE CONTRACTOR SHALL SUBMIT A MUTUALLY COMPATIBLE AND SUITABLE FOR THE INTENDED USE, AND WILL FIT THE AVAILABLE SPACE AND ALLOW AMPLE ROOM FOR MAINTENANCE. HIGHLIGHT, MARK, LIST OR INDICATE THE MATERIALS, PERFORMANCE CRITERIA AND ACCESSORIES THAT ARE BEING PROPOSED. SUBMIT SHOP DRAWINGS AS EARLY AS REQUIRED TO SUPPORT THE PROJECT SCHEDULE. ALLOW FOR TWO WEEKS ENGINEER REVIEW TIME PLUS MAILING TIME PLUS A DUPLICATION OF THIS TIME FOR RESUBMITAL IF REQUIRED.

SUBMITTALS AND SHOP DRAWINGS SHALL NOT CONTAIN HE'S FIRM NAME OR LOGO, NOR SHALL IT CONTAIN THE HE'S ENGINEERS' SEAL AND SIGNATURE. THEY SHALL NOT BE COPIES OF HE'S WORK PRODUCT. IF THE CONTRACTOR DESIRES TO USE ELEMENTS OF SUCH PRODUCT, REFER TO PARAGRAPH "ELECTRONIC DRAWING FILES" FOR PROCEDURES TO BE USED.

THE ENGINEER'S CHECKING AND SUBSEQUENT APPROVAL OF SUCH SHOP DRAWINGS WILL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS IN DIMENSIONS, DETAILS, SIZE OF MEMBERS, QUANTITIES, OMISSIONS OF COMPONENTS OR FITTINGS; COORDINATION OF ELECTRICAL REQUIREMENTS; OR FOR COORDINATING ITEMS WITH ACTUAL BUILDING CONDITIONS. PROCEED WITH THE PROCUREMENT AND INSTALLATION OF EQUIPMENT ONLY AFTER RECEIVING APPROVED SHOP DRAWINGS RELATIVE TO EACH ITEM.

CATALOG DATA SHALL BE PROPERLY BOUND, IDENTIFIED, INDEXED AND TABBED IN A 3-RING BINDER. LABEL THE CATALOG DATA WITH THE EQUIPMENT IDENTIFICATION ACRONYM OR NUMBER AS USED ON THE DRAWINGS AND INCLUDE PERFORMANCE CURVES, CAPACITIES, SIZES, WEIGHTS, MATERIALS, FINISHES, WIRING DIAGRAMS, ELECTRICAL REQUIREMENTS AND DEVIATIONS FROM SPECIFIED EQUIPMENT OR MATERIALS. FOR EQUIPMENT WITH MOTOR STARTERS OR VFDS, INCLUDE SHORT CIRCUIT CURRENT RATINGS. MARK OUT INAPPLICABLE ITEMS. SHOP DRAWINGS WILL BE RETURNED WITHOUT REVIEW IF THE ABOVE MENTIONED REQUIREMENTS ARE NOT MET.

REFER TO DIVISION 1 FOR ACCEPTANCE OF ELECTRONIC SUBMITTALS FOR THIS PROJECT. FOR ELECTRONIC SUBMITTALS, CONTRACTOR SHALL SUBMIT THE DOCUMENTS IN ACCORDANCE WITH THE PROCEDURES SPECIFIED IN DIVISION 1. CONTRACTOR SHALL NOTIFY THE ARCHITECT AND ENGINEER THAT THE SHOP DRAWINGS HAVE BEEN POSTED. IF ELECTRONIC SUBMITTAL PROCEDURES ARE NOT DEFINED IN DIVISION 1, CONTRACTOR SHALL INCLUDE THE WEBSITE, USER NAME AND PASSWORD INFORMATION NEEDED TO ACCESS THE SUBMITTALS. FOR SUBMITTALS SENT BY E-MAIL, CONTRACTOR SHALL COPY THE ARCHITECT AND ENGINEER'S DESIGNATED REPRESENTATIVES. CONTRACTOR SHALL ALLOW THE ENGINEER REVIEW TIME AS SPECIFIED ABOVE IN THE CONSTRUCTION SCHEDULE. CONTRACTOR SHALL SUBMIT ONLY THE DOCUMENTS REQUIRED TO PURCHASE THE MATERIALS

AND/OR EQUIPMENT IN THE ELECTRONIC SUBMITTAL AND SHALL CLEARLY IDENTIFY THE MATERIALS, PERFORMANCE CRITERIA AND ACCESSORIES BEING PROPOSED. GENERAL PRODUCT CATALOG DATA NOT SPECIFICALLY NOTED TO BE PART OF THE SPECIFIED PRODUCT WILL BE REJECTED AND RETURNED WITHOUT REVIEW.

15A ELECTRONIC DRAWING FILES

IN PREPARATION OF SHOP DRAWINGS OR RECORD DRAWINGS, CONTRACTOR MAY, AT HIS OPTION, OBTAIN ELECTRONIC DRAWING FILES IN AUTOCAD OR DXF FORMAT ON CD-ROM DISK, DVD DISK, FLASH DRIVE OR DIRECT DOWNLOAD, AS DESIRED, FROM THE ENGINEER FOR A SHIPPING AND HANDLING FEE OF \$200 FOR A DRAWING SET UP TO 12 SHEETS AND \$15 PER SHEET FOR EACH ADDITIONAL SHEET. CONTRACTOR SHALL CONTACT THE ARCHITECT FOR WRITTEN AUTHORIZATION AND ENGINEER FOR THE NECESSARY RELEASE AGREEMENT FORM AND TO SPECIFY SHIPPING METHOD AND DRAWING FORMAT. IN ADDITION TO PAYMENT, ARCHITECT'S WRITTEN AUTHORIZATION AND ENGINEER'S RELEASE AGREEMENT FORM MUST BE RECEIVED BEFORE ELECTRONIC DRAWING FILES WILL BE SENT.

15A OPERATION AND MAINTENANCE INSTRUCTIONS

DURING THE COURSE OF CONSTRUCTION, COLLECT AND COMPIL A COMPLETE BROCHURE OF EQUIPMENT FURNISHED AND INSTALLED ON THIS PROJECT. INCLUDE OPERATIONAL AND MAINTENANCE INSTRUCTIONS, MANUFACTURER'S CATALOG SHEETS, WIRING DIAGRAMS, PARTS LISTS, APPROVED SHOP DRAWINGS, AND DESCRIPTIVE LITERATURE AS FURNISHED BY THE EQUIPMENT MANUFACTURER. INCLUDE AN INSIDE COVER SHEET THAT LISTS THE PROJECT NAME, DATE, OWNER, ARCHITECT, CONSULTING ENGINEER, GENERAL CONTRACTOR, SUB-CONTRACTOR, AND AN INDEX OF CONTENTS.

SUBMIT THREE COPIES OF LITERATURE BOUND IN APPROVED BINDERS WITH INDEX AND TABS SEPARATING EQUIPMENT TYPES TO THE ARCHITECT AT THE TERMINATION OF THE WORK. PAPER CLIPS, STAPLES, RUBBER BANDS, AND MAILING ENVELOPES ARE NOT CONSIDERED APPROVED BINDERS. FINAL APPROVAL OF MECHANICAL SYSTEMS INSTALLED UNDER THIS CONTRACT WILL BE WITHHELD UNTIL THIS EQUIPMENT BROCHURE IS RECEIVED AND DEEMED COMPLETE BY THE ARCHITECT AND ENGINEER. INSTRUCT WORKMEN TO SAVE REQUIRED LITERATURE SHIPPED WITH THE EQUIPMENT ITSELF, FOR INCLUSION IN THIS BROCHURE.

PROVIDE "AS-BUILT" DRAWINGS (SEE DIVISION 1 AND GENERAL CONDITIONS).

15A SPARE PARTS

FURNISH TO OWNER, WITH RECEIPT, THE FOLLOWING SPARE PARTS FOR THE EQUIPMENT FURNISHED FOR THIS PROJECT:

- A. ONE SET OF SPARE FILTERS OF EACH TYPE REQUIRED FOR EACH UNIT. IN ADDITION TO THE SPARE SET OF FILTERS, INSTALL NEW FILTERS PRIOR TO TESTING, ADJUSTING, AND BALANCING WORK AND BEFORE TURNING SYSTEM OVER TO OWNER.
B. FURNISH ONE COMPLETE SET OF BELTS FOR EACH FAN.
C. FURNISH THREE OPERATING KEYS FOR EACH TYPE OF AIR OUTLET AND INLET THAT REQUIRE THEM.

15A WARRANTIES

WARRANT EACH SYSTEM AND EACH ELEMENT THEREOF AGAINST ALL DEFECTS DUE TO FAULTY WORKMANSHIP, DESIGN OR MATERIAL FOR A PERIOD OF 12 MONTHS FROM DATE OF SUBSTANTIAL COMPLETION UNLESS SPECIFIC ITEMS ARE NOTED TO CARRY A LONGER WARRANTY IN THE CONSTRUCTION DOCUMENTS OR MANUFACTURER'S STANDARD WARRANTY EXCEEDS 12 MONTHS. REMEDY ALL DEFECTS, OCCURRING WITHIN THE WARRANTY PERIOD(S), AS STATED IN THE GENERAL CONDITIONS AND DIVISION 1.

WARRANTIES SHALL INCLUDE LABOR AND MATERIAL. MAKE REPAIRS OR REPLACEMENTS WITHOUT ANY ADDITIONAL COSTS TO THE OWNER. PERFORM THE REMEDIAL WORK PROMPTLY, UPON WRITTEN NOTICE FROM THE ENGINEER OR OWNER.

AT THE TIME OF SUBSTANTIAL COMPLETION, DELIVER TO THE OWNER ALL WARRANTIES, IN WRITING AND PROPERLY EXECUTED, INCLUDING TERM LIMITS FOR WARRANTIES EXTENDING BEYOND THE ONE YEAR PERIOD, EACH WARRANTY INSTRUMENT BEING ADDRESSED TO THE OWNER AND STATING THE COMMENCEMENT DATE AND TERM.

15A CUTTING AND PATCHING

PERFORM CUTTING OF WALLS, FLOORS, CEILINGS, ETC. AS REQUIRED TO INSTALL WORK UNDER THIS SECTION. OBTAIN PERMISSION FROM THE ARCHITECT PRIOR TO CUTTING, DO NOT CUT OR DISTURB STRUCTURAL MEMBERS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT. CUT HOLES AS SMALL AS POSSIBLE. GENERAL CONTRACTOR SHALL PATCH WALLS, FLOORS, ETC. AS REQUIRED BY WORK UNDER THIS SECTION. PATCHING SHALL MATCH THE ORIGINAL MATERIAL AND CONSTRUCTION. REPAIR AND FINISH AREAS DISTURBED BY WORK TO THE CONDITION OF ADJOINING SURFACES IN A MANNER SATISFACTORY TO THE ARCHITECT.

15A ROUGH-IN

COORDINATE WITHOUT DELAY ROUGH-IN WITH GENERAL CONSTRUCTION. CONCEAL PIPING AND CONDUIT ROUGH-IN EXCEPT IN UNFINISHED AREAS AND WHERE OTHERWISE SHOWN.

15A PENETRATIONS

PROVIDE SLEEVES FOR PIPES PASSING THROUGH ABOVE GRADE CONCRETE OR MASONRY WALLS, CONCRETE FLOOR OR ROOF SLABS. SLEEVES ARE NOT REQUIRED FOR CORE DRILLED HOLES IN EXISTING MASONRY WALLS, CONCRETE FLOORS OR ROOFS. PROVIDE 10 GAUGE GALVANIZED STEEL SLEEVES FOR SLEEVES 6" AND SMALLER. PROVIDE GALVANIZED SHEET METAL SLEEVES FOR LARGER THAN 6". SCHEDULE 40 PVC SLEEVES ARE ACCEPTABLE FOR INSTALLATION IN AREAS WITHOUT RETURN AIR PLENUMS.

SEAL ELEVATED FLOOR, EXTERIOR WALL AND ROOF PENETRATIONS WATERTIGHT AND WEATHERTIGHT WITH NON-SHRINK, NON-HARDENING COMMERCIAL SEALANT. PACK WITH MINERAL WOOL AND SEAL BOTH ENDS WITH MINIMUM OF 1/2" OF SEALANT.

SEAL AROUND PENETRATIONS OF FIRE RATED ASSEMBLIES. COORDINATE FIRE RATINGS AND LOCATIONS WITH THE ARCHITECTURAL DRAWINGS. REFER TO ARCHITECTURAL SPECIFICATIONS FOR FIRE STOPPING. PROVIDE A PRODUCT SCHEDULE FOR EACH PENETRATION FIRE STOP SYSTEM.

EXTEND PIPE INSULATION FOR INSULATED PIPE THROUGH FLOOR, WALL AND ROOF PENETRATIONS, INCLUDING FIRE RATED WALLS AND FLOORS. THE VAPOR BARRIER SHALL BE MAINTAINED. SIZE SLEEVE FOR A MINIMUM OF 1" ANNULAR CLEAR SPACE BETWEEN INSIDE OF SLEEVE AND OUTSIDE OF INSULATION.

PROVIDE PREFABRICATED ROOF CURBS MANUFACTURED BY CUSTOM CURB, INC., PATE COMPANY, THYCURB OR APPROVED EQUAL. PROVIDE ROOF CURB WITH FACTORY INSTALLED WOOD NAILER; WELDED, 18 GAUGE GALVANIZED STEEL SHELL, BASE PLATE AND FLASHING; 1-1/2" THICK, 3 POUND RIGID INSULATION; FULLY MITERED 3-INCH RAISED RANT; COVER OF WEATHER-RESISTANT, WEATHER-PROOF MATERIAL AND PIPE COLLAR OF WEATHER-RESISTANT MATERIAL WITH STAINLESS STEEL PIPE CLAMPS.

PROVIDE BOX FRAMES FOR RECTANGULAR OPENINGS WELDED 12 GAUGE GALVANIZED STEEL ATTACHED TO FORMS AND OF A MAXIMUM DIMENSION ESTABLISHED BY THE ARCHITECT. NOTIFY THE GENERAL CONTRACTOR OR ARCHITECT BEFORE INSTALLING ANY BOX OPENINGS NOT SHOWN ON THE ARCHITECTURAL OR STRUCTURAL DRAWINGS.

SEAL CONCRETE OR MASONRY EXTERIOR WALL PENETRATIONS BELOW GRADE WITH "WALL PIPES" AND MECHANICAL SLEEVE SEALS. PROVIDE CAST IRON "WALL PIPES" WITH INTEGRAL WATERSTOP RING MANUFACTURED BY JOSAM, JAY R. SMITH, WADE, WATTS OR ZURN. PROVIDE MODULAR MECHANICAL SLEEVE SEALS, MANUFACTURED BY THUNDERLINE / LINK SEAL, CALPICO, INC. AND METRAFLEX.

SEAL ELEVATED CONCRETE SLAB WITH WATER PROOF MEMBRANE PENETRATIONS WITH "WALL PIPES" AND WATER PROOF SEALANT. SECURE WATERPROOF MEMBRANE FLASHING BETWEEN "WALL PIPE" CLAMPING FLANGE AND CLAMPING RING. PROVIDE CAST IRON "WALL PIPES" WITH INTEGRAL WATERSTOP RING MANUFACTURED BY JOSAM, JAY R. SMITH, WADE, WATTS OR ZURN.

PROVIDE SLEEVES FOR HORIZONTAL PIPE PASSING THROUGH OR UNDER FOUNDATION. SLEEVES SHALL BE CAST IRON SOIL PIPE TWO NOMINAL PIPE SIZES LARGER THAN THE PIPE SERVED.

PROVIDE SCHEDULE 40 PVC PIPE SLEEVES FOR VERTICAL PRESSURE PIPE PASSING THROUGH CONCRETE SLAB ON GRADE. SLEEVES SHALL BE ONE NOMINAL PIPE SIZE LARGER THAN THE PIPE SERVED AND TWO PIPE SIZES LARGER THAN PIPE SERVED FOR DUCTILE IRON PIPES WITH RESTRAINING RODS. SEAL WATER-TIGHT WITH SILICONE CAULK.

PROVIDE 1/2" THICK CELLULAR FOAM INSULATION AROUND PERIMETER OF NON-PRESSURE PIPE PASSING THRU CONCRETE SLAB ON GRADE. INSULATION SHALL EXTEND TO 2" ABOVE AND BELOW THE CONCRETE SLAB.

15A ELECTRICAL WIRING

LINE VOLTAGE WIRING SHALL BE PROVIDED BY DIVISION 16. LINE VOLTAGE CONTROL AND INTERLOCK WIRING FOR MECHANICAL SYSTEMS SHALL ALSO BE PROVIDED BY DIVISION 16 CONTRACTOR. LOW VOLTAGE CONTROL WIRING SHALL BE PROVIDED BY THE DIVISION 15 CONTRACTOR. FURNISH WIRING DIAGRAMS TO THE DIVISION 16 CONTRACTOR AS REQUIRED FOR PROPER EQUIPMENT HOOKUP. COORDINATE WITH THE DIVISION 16 CONTRACTOR THE ACTUAL WIRE SIZING AMPS FOR MECHANICAL EQUIPMENT (FROM THE EQUIPMENT NAMEPLATE) TO ENSURE PROPER INSTALLATION.

15A FINAL TESTING AND ADJUSTMENTS

FINAL SYSTEM TESTING, BALANCING AND ADJUSTMENTS (TAB) SHALL BE PERFORMED BY A CONTRACTOR CERTIFIED BY THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB), ASSOCIATED AIR BALANCE COUNCIL (AABC) OR TESTING, ADJUSTING AND BALANCING (TAB). TAB SHALL BE PERFORMED IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE CERTIFIED AGENCIES PROCEDURAL STANDARD FOR TESTING, ADJUSTING AND BALANCING AND SHALL COMPLY WITH THE STRICTEST INTERPRETATION OF THAT STANDARD FOR EXECUTION AND REPORTING OF ALL TAB WORK. WORK SHALL INCLUDE BUT NOT BE LIMITED TO: PERFORM TEST READING ON FANS, UNITS, COILS, PUMPS, ETC. AND ADJUST EQUIPMENT TO DELIVER SPECIFIED AMOUNT OF AIR. PREPARE TESTING AND BALANCING REPORT LOG SHOWING AIR SUPPLY QUANTITIES, AIR ENTERING AND LEAVING TEMPERATURES AND PRESSURES AT DESIGN FLOW. [WATER FLOWS, WATER ENTERING AND LEAVING TEMPERATURES AND PRESSURES AT DESIGN FLOW] FAN AND UNIT TEST READINGS, MOTOR VOLTAGE AND AMP DRAWS, ETC., AND SUBMIT SIX COPIES OF THE FINAL COMPLETION OF DATA TO THE ARCHITECT FOR EVALUATION AND APPROVAL BEFORE FINAL INSPECTION OF THE PROJECT. BALANCE AIR SYSTEMS TO WITHIN PLUS OR MINUS 10 PERCENT FOR TERMINAL DEVICES AND BRANCH LINES AND PLUS OR MINUS 5 PERCENT FOR MAIN DUCTS AND AIR HANDLING EQUIPMENT OF THE AMOUNT OF AIR SHOWN ON THE DRAWINGS. TAB CONTRACTOR SHALL RECORD SPACE TEMPERATURES AND MAKE ADJUSTMENTS IN AIRFLOW TO EACH DIFFUSER TO OBTAIN UNIFORM TEMPERATURE (NO GREATER THAN +/- 3 F) IN SPACES. DOCUMENT TEMPERATURES AND ADJUSTMENTS IN TAB REPORT. [ADJUST BALANCING DEVICES TO PROVIDE WATER FLOWS WITHIN PLUS OR MINUS 5 PERCENT OF FLOW SPECIFIED ON DRAWINGS OR AS REQUIRED FOR PROPER SYSTEM OPERATION.] ADJUST EQUIPMENT TO OPERATE AS INTENDED BY THE SPECIFICATION. TAB REPORT SHALL INCLUDE A REPORT SUMMARY/REMARKS SECTION IN ACCORDANCE WITH THE PROCEDURAL STANDARD THAT PROVIDES BOTH SYSTEM SET UP AND A SUMMARY OF DEFICIENCIES AS DEFINED BY THE PROCEDURAL STANDARD.

TAB CONTRACTOR SHALL BE RESPONSIBLE TO CALIBRATE, SET, AND ADJUST AUTOMATIC TEMPERATURE CONTROL SENSORS, ACTUATORS AND CONTROL DEVICES. CHECK PROPER SEQUENCING OF INTERLOCK SYSTEMS, AND OPERATION OF SAFETY CONTROLS, ADJUST THERMOSTATS, AND CONTROL SETPOINTS, LIMITS AND TIME BASED ADJUSTMENT TO OPERATE IN ACCORDANCE WITH THE PERFORMANCE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS. ADJUST PUMPS, FANS, ETC. FOR PROPER AND EFFICIENT OPERATION. CERTIFY TO ARCHITECT THAT ADJUSTMENTS HAVE BEEN MADE AND THAT SYSTEM IS OPERATING SATISFACTORYLY. CALIBRATE, SET, AND ADJUST AUTOMATIC TEMPERATURE CONTROLS. CHECK PROPER SEQUENCING OF INTERLOCK SYSTEMS, AND OPERATION OF SAFETY CONTROLS.

MECHANICAL CONTRACTOR SHALL ALIGN BEARINGS AND REPLACE BEARINGS THAT HAVE DIRT OR FOREIGN MATERIAL IN THEM WITH NEW BEARINGS WITHOUT ADDITIONAL COST TO THE OWNER.

15A EQUIPMENT FURNISHED BY OTHERS

PROVIDE NECESSARY EQUIPMENT AND ACCESSORIES THAT ARE NOT PROVIDED BY THE EQUIPMENT SUPPLIER OR OWNER TO COMPLETE INSTALLATION OF COOKING EQUIPMENT, WASHING EQUIPMENT, ETC., FURNISHED BY OTHERS, IN LOCATIONS AS INDICATED ON THE DRAWINGS AND/OR DESCRIBED IN THE GENERAL NOTES TO THIS CONTRACT. EQUIPMENT AND ACCESSORIES NOT PROVIDED BY THE EQUIPMENT SUPPLIER MAY INCLUDE FLUES, VENTS, INTAKES, ASSOCIATED ROOF JACKS AND CAPS TO OUTDOORS, DAMPERS, IN-LINE FANS, ROOF FANS, CONTROL INTERLOCKS, ETC. AS REQUIRED FOR PROPER OPERATION OF THE COMPLETE SYSTEM IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECT ROUGH-IN DIMENSIONS, AND SHALL VERIFY SAME WITH ARCHITECT AND/OR EQUIPMENT SUPPLIER PRIOR TO SERVICE INSTALLATIONS.

15A MISCELLANEOUS REMODELING WORK

REMOVE ALL UNUSED EQUIPMENT, DUCTWORK, PIPING AND ASSOCIATED SUPPORTS. CAP DUCTWORK AND PIPING AT MAINS AND SEAL AIR AND WATER TIGHT.

PROVIDE ITEMS OF HVAC SYSTEMS MODIFICATION REQUIRED BECAUSE OF BUILDING REMODELING, AS NOTED ON THE DRAWINGS OR NECESSARY FOR PROPER OPERATION. MATCH EXISTING MATERIALS AND CONSTRUCTION TECHNIQUES WHEN MODIFYING EXISTING SYSTEMS UNLESS SPECIFIED OTHERWISE. COORDINATE ADDITIONAL REQUIREMENTS WITH GENERAL CONTRACTOR AND ARCHITECT.

SEAL AIRTIGHT EXISTING DUCTWORK REQUIRED TO BE ABANDONED IN PLACE OR NOT IN USE AT THE TERMINATION OF THE WORK.

CAP AND SEAL WEATHERTIGHT EXISTING ROOF CURBS AND ROOF OPENINGS TO BE ABANDONED IN PLACE AS A RESULT OF EQUIPMENT REMOVAL.

CLEAN AND REBALANCE EXISTING DUCTWORK, DIFFUSERS, REGISTERS, AND GRILLES INTENDED FOR REUSE AS REQUIRED OR AS INDICATED ON DRAWINGS.

CLEAN AND REFURBISH EXISTING HVAC EQUIPMENT INTENDED FOR REUSE AS REQUIRED FOR PROPER OPERATION INCLUDING REPLACEMENT OF FILTERS, BELTS, MOTORS, REMOTE CONTROLS, AND SAFETY INTERLOCKS.

15A BUILDING OPERATION

COMPLY WITH THE SCHEDULE OF OPERATIONS AS OUTLINED IN THE ARCHITECTURAL PORTIONS OF THIS SPECIFICATION. BUILDING SHALL BE IN CONTINUOUS OPERATION. COMPLETE ALL WORK REQUIRED INCLUDING INTERUPTION OF BUILDING OPERATION AT A TIME WHEN THE BUILDING IS NOT IN OPERATION, AND ONLY WITH WRITTEN APPROVAL OF BUILDING OWNER AND/OR TENANT. COORDINATE INTERRUPTION OF BUILDING OPERATION WITH THE OWNER AND/OR TENANT A MINIMUM OF SEVEN DAYS IN ADVANCE OF WORK.

15A DUCTWORK, ACCESSORIES, AND FANS

15A DUCTWORK

PROVIDE GALVANIZED STEEL DUCTWORK AND HOUSINGS AS SHOWN ON DRAWINGS. CONSTRUCT DUCTWORK INCLUDING FITTINGS AND TRANSITIONS IN CONFORMANCE WITH CURRENT SMACNA STANDARDS RELATIVE TO GAUGE, BRACING, JOINTS, ETC. MINIMUM THICKNESS OF DUCT SHALL BE 26-GAUGE SHEET METAL. SUPPORT HORIZONTAL RUNS OF DUCT FROM STRAP IRON HANGERS ON CENTERS NOT TO EXCEED 8'-0". DO NOT SUPPORT CEILING GRID, CONDUITS, PIPES, EQUIPMENT, ETC. FROM DUCTWORK. COVER JOINTS OF DUCTWORK WITH GASKETS WITH WRITTEN APPROVAL OF CONTRACTORS SUCH THAT PIPING, ELECTRICAL CONDUIT, AND ASSOCIATED SUPPORTS ARE NOT ROUTED THROUGH THE DUCTWORK.

CONSTRUCT EXHAUST DUCTWORK DOWNSTREAM OF FANS TO MEET SMACNA POSITIVE PRESSURE OF 1" W.G.

PROVIDE MILL PHOSPHATIZED OR GALVANEATED FINISH FOR EXPOSED DUCTWORK TO BE FIELD PAINTED. SHOP TREATED SHEET METAL SHALL HAVE GALVANIZED METAL PRIMER APPLIED IN THE SHOP AFTER FABRICATION AND PRIOR TO SHIPPING.

SEAL DUCTWORK WITH HEAVY LIQUID SEALANT, HARDCAST IGRONRIP 601, DESIGN POLYMER DP 1010, UNITED MCGILL DUCT SEALER OR APPROVED EQUAL, APPLIED ACCORDING TO SEALANT MANUFACTURER'S INSTRUCTIONS. TAPES AND MASTICS SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A. FOR EXHAUST DUCTS OPERATING UNDER POSITIVE PRESSURE SEAL JOINTS AND PENETRATIONS TO MEET SMACNA SEAL CLASS A.

PROVIDE RADIUS ELBOWS, TURNS, AND OFFSETS WITH A MINIMUM CENTERLINE RADIUS OF 1-1/2 TIMES THE DUCT WIDTH. WHERE SPACE DOES NOT PERMIT FULL RADIUS ELBOWS, PROVIDE SHORT RADIUS ELBOWS WITH A MINIMUM OF TWO CONTINUOUS SPLITTER VANES. VANES SHALL BE THE ENTIRE LENGTH OF THE BEND. PROVIDE MITERED ELBOWS WHERE SPACE DOES NOT PERMIT RADIUS ELBOWS, WHERE SHOWN ON THE DRAWINGS, OR AT THE OPTION OF THE CONTRACTOR WITH THE ENGINEER'S APPROVAL. MITERED ELBOWS LESS THAN 45 DEGREES SHALL NOT REQUIRE TURNING VANES. MITERED ELBOWS 45-DEGREES AND GREATER SHALL HAVE SINGLE THICKNESS TURNING VANES. MITERED ELBOWS 45-DEGREES AND GREATER SHALL HAVE SINGLE THICKNESS TURNING VANES OF SAME GAUGE AS DUCTWORK, RIGIDLY FASTENED WITH GUIDE STRIPS IN DUCTWORK. VANES FOR MITERED ELBOWS SHALL BE PROVIDED IN ALL EXHAUST DUCTWORK.

DUCTS SHALL BE CONNECTED TO FANS, FAN CASINGS AND FAN PLENUMS BY MEANS OF FLEXIBLE CONNECTORS. FLEXIBLE CONNECTORS SHALL BE NEOPRENE COATED GLASS CLOTH CANVAS CONNECTIONS, DURO-DYNE, ELGEN, VENTFABRIC OR EQUAL. FLEXIBLE CONNECTORS SHALL HAVE A FLAME SPREAD OF 25 OR LESS AND SMOKE DEVELOPED RATING NOT HIGHER THAN 50. MAKE AIRTIGHT JOINTS AND INSTALL WITH MINIMUM 1-1/2" SLACK.

ROUND OR OVAL DUCTWORK SHALL BE SEMCO, UNITED, WESCO OR EQUAL, SHEETMETAL, WITH SMOOTH INTERIOR SURFACE, WITH LOW PRESSURE (DUCT PRESSURE CLASS UP TO AND INCLUDING 2" W.G.) ROUND DUCTWORK GAUGES PER THE FOLLOWING TABLE:

Table with 3 columns: SIZE 14" & UNDER, DUCT GAUGE 26, FITTING GAUGE 24

LINDAB SIROSAFE, LEWIS & LAMBERT OR APPROVED EQUAL FACTORY-MANUFACTURED ROUND DUCTWORK AND FITTINGS MAY BE SUBSTITUTED FOR SPECIFIED ROUND BRANCH DUCTWORK, AT CONTRACTORS OPTION. HEAVY LIQUID JOINT SEALANT MAY BE OMITTED ON FACTORY-MANUFACTURED ROUND DUCTWORK.

LOW PRESSURE (DUCT PRESSURE CLASS UP TO AND INCLUDING 2" W.G.) FITTINGS 24" IN DIAMETER AND LESS SHALL BE PREFABRICATED, SPOTWELDED AND INTERNALLY SEALED. FITTING GAUGE SHALL BE 22 GAUGE FOR 36" FITTINGS AND UNDER. SEAL LONGITUDINAL AND TRANSVERSE DUCTWORK JOINTS AIRTIGHT WITH HEAVY LIQUID SEALANT APPLIED ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

15A LOUVERS, PLENUMS, SCREENS

PROVIDE EXHAUST AIR LOUVERS BY RUSKIN MODEL ELF375X OR EQUAL GREENHECK, AMERICAN WARMING & VENTILATING, CESCO, INDUSTRIAL LOUVERS OR LOUVERS & DAMPERS AS SCHEDULED ON THE DRAWINGS. COORDINATE EXACT SIZE AND LOCATION WITH ARCHITECTURAL DRAWINGS. LOUVERS SHALL BE STATIONARY, WITH MILL FINISH. LOUVERS SHALL HAVE EXTRUDED ALUMINUM BLADES, 0.080" WALL THICKNESS, 45 DEGREE BLADE ANGLE, BLADES ON 5" CENTERS; FRAME SHALL BE EXTRUDED ALUMINUM, 0.080" WALL THICKNESS, WITH EXPANDED FLATTENED ALUMINUM BIRDSCREEN. PROVIDE LOUVERS WITH A MINIMUM FREE AREA OF 45 PERCENT, WITH A MAXIMUM AIR PRESSURE DROP OF 0.1" AT SCHEDULED AIRFLOW.

CONSTRUCT PLENUMS WITH GALVANIZED STEEL FRAMING MEMBERS AND GALVANIZED SHEETMETAL, BRACED WITH GALVANIZED STEEL. BRACES AND BRACING SHALL CONFORM TO SMACNA RECOMMENDATIONS FOR DUCTWORK OF LIKE SIZES. WHERE ACCESS DOORS ARE SHOWN, PROVIDE HINGED DOORS WITH #202 VENTLOK LATCH. MAKE WATER TIGHT CONNECTIONS TO LOUVERS, SLOPING BOTTOM OF PLENUM TO DRAIN WATER TO WEEPHOLES IN BOTTOM OF LOUVER.

PROVIDE SCREENS ON LOUVERS AS SCHEDULED AND/OR NOTED ON THE DRAWINGS. BIRD SCREENS SHALL BE 0.041-INCH, 1/2-INCH MESH GALVANIZED STEEL WIRE.

15A SHOP EXHAUST HOODS

PROVIDE GALVANIZED STEEL EXHAUST HOODS AS DETAILED ON THE DRAWINGS. HOODS SHALL BE 18 GAUGE MATERIAL, RIGIDLY BRACED AND SUPPORTED SO AS TO PREVENT VIBRATION OR BENDING.

Table with 2 columns: Revision, Date

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