

HVAC SPECIFICATIONS

15510 GENERAL PROVISIONS

- A. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL A HEATING, VENTILATING AND AIR CONDITIONING SYSTEM, COMPLETE AS INDICATED ON THE DRAWINGS, AS REQUIRED BY CODE AND AS SPECIFIED HEREIN.
- B. WITHOUT RESTRICTING THE GENERALITY OF THE FIRST STATEMENT, THE WORK TO BE PERFORMED UNDER THIS DIVISION SHALL INCLUDE, BUT IS NOT LIMITED TO, THE FOLLOWING:
 - 1) HVAC WORK AS DESCRIBED IN SECTIONS 15510 THROUGH 15975.
- C. THE ELECTRICAL CONTRACTOR, UNLESS OTHERWISE NOTED IS TO PROVIDE POWER WIRING FOR EACH ITEM OF ELECTRICAL EQUIPMENT AND MAKE FINAL CONNECTION TO MOTORS.
- D. ALL FINISH PAINTING IS TO BE PERFORMED BY THE GENERAL CONTRACTOR, EXCEPT AS NOTED ELSEWHERE. THIS CONTRACTOR SHALL RESTORE TO ORIGINAL CONDITION ANY PAINTING DEFACED BY HIM AFTER ORIGINAL PAINTING.
- E. ALL WORK SHALL CONFORM TO CODES, RULES, AND REGULATIONS:
 - 1) NATIONAL ELECTRIC CODE.
 - 2) STANDARD FOR THE INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS, NFPA 90A.
 - 3) CODE FOR SAFETY TO LIFE FROM FIRE IN BUILDINGS AND STRUCTURES, NFPA 101.
 - 4) FEDERAL OCCUPATIONAL SAFETY AND HEALTH STANDARDS.
 - 5) STATE MECHANICAL CODE.
 - 6) STATE BUILDING CODE
 - 7) STATE INDUSTRIAL COMMISSION REQUIREMENTS.
 - 8) LOCAL BUILDING CODE REQUIREMENTS.
 - 9) BUILDING INSURING AGENCY REQUIREMENTS.
- F. ALL PERMITS REQUIRED BY LAWS, ORDINANCES AND BUILDING CODES HAVING JURISDICTION SHALL BE OBTAINED AT THE PROPER TIME BY AND AT THE EXPENSE OF THIS CONTRACTOR.
- G. THIS CONTRACTOR SHALL OBTAIN ALL INSPECTIONS REQUIRED BY ALL LAWS, ORDINANCES AND PUBLIC AUTHORITY HAVING JURISDICTION AND SHALL OBTAIN CERTIFICATES OF SUCH INSPECTIONS AND SUBMIT SAME TO THE ARCHITECT AND SHALL PAY ALL FEES, CHARGES, ASSESSMENTS AND OTHER EXPENSES IN CONNECTION THEREWITH.
- H. PIPING AND EQUIPMENT LAYOUT IS SCHEMATIC. EXACT LOCATIONS ARE DETERMINED BY STRUCTURAL AND OTHER CONDITIONS. DESIGN OF SYSTEM MAY NOT BE CHANGED, ONLY EXACT LOCATION OF PIPING AND DUCTS MAY BE REVISED TO SUIT CONSTRUCTION CONDITIONS AND AID IN COORDINATION WITH WORK OF OTHER CONTRACTORS.
- I. THE MATERIALS AND EQUIPMENT INSTALLED IN THE WORK SHALL MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND NO MATERIALS OR EQUIPMENT SHALL BE ORDERED UNTIL REVIEWED BY THE ENGINEER AND/OR ARCHITECT.
- J. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS PER THE DOCUMENTS PROVIDED BY THE OWNER/ARCHITECT/CONTRACTOR.
- K. CATALOG DATA FOR EQUIPMENT REVIEWED BY THE ARCHITECT SHALL NOT SUPERSEDE THE ENGINEER'S CONTRACT DOCUMENTS. THE REVIEW OF THE ENGINEER SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR DEVIATIONS FROM DRAWINGS OR SPECIFICATIONS, PROVIDING PROPER CLEARANCE, FABRICATION PROCESS AND COORDINATION WITH OTHER TRADES.
- L. WHEN SUBMITTED FOR THE ARCHITECT'S REVIEW, SHOP DRAWINGS SHALL BEAR THE CONTRACTOR'S CERTIFICATION THAT HE HAS REVIEWED, CHECKED AND APPROVED THE SHOP DRAWINGS, THAT THEY ARE IN HARMONY WITH THE REQUIREMENTS OF THE PROJECT AND WITH THE PROVISIONS OF THE CONTRACT DOCUMENTS AND THAT HE HAS VERIFIED ALL FIELD MEASUREMENTS AND CONSTRUCTION CRITERIA, MATERIALS, CATALOG NUMBERS AND SIMILAR DATA. CONTRACTOR SHALL ALSO CERTIFY THAT THE WORK REPRESENTED BY THE SHOP DRAWINGS IS RECOMMENDED BY THE CONTRACTOR AND THE CONTRACTOR'S GUARANTEE WILL FULLY APPLY.
- M. ALL CONTRACTORS SUBMITTING PROPOSALS FOR THIS WORK SHALL FIRST EXAMINE THE SITE AND ALL CONDITIONS THEREIN. ALL PROPOSALS SHALL TAKE INTO CONSIDERATION ALL SUCH CONDITIONS AS MAY AFFECT THE WORK UNDER THIS CONTRACT. THE SUBMITTING OF A BID AUTOMATICALLY IMPLIES THAT THIS EXAMINATION OF SITE HAS BEEN DONE.
- N. CONTRACTOR SHALL VERIFY LOCATION OF UTILITIES AND NOTE CONDITIONS WHICH WOULD AFFECT THE WORK. ALL DISCREPANCIES SHALL THEN BE REPORTED PRIOR TO THE BID AWARD.
- O. PROVIDE INSTRUCTION TO OWNER'S OPERATING PERSONNEL AS NECESSARY, SHOWING LOCATIONS AND PROPER OPERATION OF MAJOR ITEMS OF EQUIPMENT AND SYSTEM COMPONENTS AND REFERRING TO THE OPERATING INSTRUCTION MANUAL DESCRIBED BELOW AS A GUIDE.
- P. COMPILe WRITTEN MANUAL OF OPERATING INSTRUCTIONS INCLUDING COPIES OF SHOP DRAWINGS AND A LISTING OF EQUIPMENT SUPPLIERS. ASSEMBLE IN 8-1/2" X 11" HARD BACKED INDEXED BINDER. MATERIAL SHALL BE AS FOLLOWS:
 - 1) TITLE PAGE: TITLE OF JOB, OWNER, ADDRESS, DATE OF SUBMISSION, CONTRACTOR AND ENGINEER.
 - 2) INDEX
 - 3) LIST OF MAJOR EQUIPMENT USED IN PROJECT ACCOMPANIED BY CONTRACTOR PURCHASE ORDER NUMBERS AND SUPPLIERS NAMES AND ADDRESSES.
 - 4) ONE COPY OF EACH SHOP DRAWING GROUPED BY TYPES OF EQUIPMENT, I.E., ROOFTOP UNITS, FANS, ETC.
 - 5) SECTION FOR EACH SYSTEM INCLUDING:
 - A) BRIEF DESCRIPTION OF SYSTEM OPERATION WITH LOCATION OF MAJOR COMPONENTS.
 - B) HVAC SYSTEM MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS AND SCHEMATICS.
- Q. SUBMIT A COMPLETED COPY TITLED "HVAC OPERATING INSTRUCTION MANUAL" ON THE BINDING EDGE OF BINDER TO ARCHITECT FOR APPROVAL. AFTER ARCHITECT'S REVIEW AND ANY CORRECTIONS REQUIRED ARE COMPLETED, SUBMIT A COPY OF THE MANUAL TO THE OWNER.
- R. WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS OF THE ACTUAL INSTALLATION SHALL BE PROVIDED TO THE BUILDING OWNER. RECORD DRAWINGS SHALL INCLUDE AS A MINIMUM THE LOCATION AND PERFORMANCE DATA ON EACH PIECE OF EQUIPMENT. GENERAL CONFIGURATION OF DUCT DISTRIBUTION SYSTEM INCLUDING SIZES, AND THE AIR DESIGN FLOW RATES.

15550 FIRESTOPPING

- A. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR FIRESTOPPING AROUND ALL OPENINGS FOR PIPES, DUCTS, CONDUITS ETC., INSTALLED BY HIM AT ALL FIRE WALLS. FIRESTOPPING SHALL BE PERFORMED BY AN INSTALLER WHO HAS BEEN TRAINED BY THE MANUFACTURER, OR MANUFACTURER'S REPRESENTATIVE IN THE INSTALLATION PROCEDURES BASED ON PUBLISHED UL TESTED FIRE STOP SYSTEMS.
- B. FIRESTOPPING SHALL MEET THE REQUIREMENTS OF ASTM E-814 OR UL 1479 FIRE TESTS BY A RECOGNIZED TESTING AGENCY. FIRESTOPPING SHALL ALSO CONFORM TO THE FOLLOWING GOVERNING CODES: OHIO BASIC BUILDING CODE, NFPA 101 - LIFE SAFETY CODE & NFPA 70 - NATIONAL ELECTRIC CODE.
- C. PENETRATION
 - 1) CLEAN PENETRATION HOLES OF DIRT, LOOSE MATERIALS AND FOREIGN MATTER WHICH MAY AFFECT BOND OR INSTALLATION.
 - 2) REMOVE COATINGS SUCH AS PAINT, CURING COMPOUNDS, WATER REPELLENT & SEALERS AS REQUIRED.
 - 3) INSTALL BACKING MATERIALS TO PREVENT LIQUID MATERIAL LEAKAGE.
- D. APPLICATION
 - 1) PREPARE AND APPLY PENETRATION SEALING SYSTEMS IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTRUCTIONS.
 - 2) EMPLOY INSTALLATION TECHNIQUES WHICH WILL ENSURE THAT FIRESTOPPING IS DEPOSITED TO FILL AND SEAL HOLES AND OPENINGS.
 - 3) TOOL EXPOSED SURFACES OF APPLIED SEALANT TO SMOOTH FINISH.
 - 4) PROTECT MATERIALS FROM DAMAGE ON SURFACES SUBJECTED TO TRAFFIC.
- E. PROVIDE INTUMESCENT SEALANTS AND COLLARS AT OPENINGS INVOLVING PLASTIC OR INSULATED PIPE SIMILAR TO THE METACALULK SERIES 880 AND 950.
- F. FIRESTOPPING BY DOW CORNING, 3M, HILTI OR METACALULK MAY FURNISHED AT THE CONTRACTOR'S OPTION.

15600 HVAC BASIC MATERIALS AND METHODS

- A. THIS CONTRACTOR IS TO BECOME INFORMED OF THE EXACT DIMENSIONS OF FINISHED WORK WHERE PIPES, DUCTS AND EQUIPMENT ARE TO BE PLACED AND WILL ARRANGE THE WORK ACCORDINGLY, ASSUMING ALL RESPONSIBILITY FOR PROPER LOCATION AND COORDINATION OF THE WORK.
- B. IN THE ERECTION OF THE DUCTWORK, SPECIAL CARE SHALL BE USED PROVIDING SUPPORT.
- C. ALL DUCTWORK SHALL BE PLACED SO AS TO AVOID INTERFERENCES WITH PLUMBING PIPES, ELECTRIC CONDUITS OR PIPES OF OTHER CONTRACTORS.
- D. ALL DUCTWORK MUST BE PROVIDED WITH SUFFICIENT DISTANCE FROM WALLS, PIPES, AND OTHER OBSTACLES TO PERMIT THE APPLICATION OF FULL THICKNESS OF INSULATION SPECIFIED.
- E. THIS CONTRACTOR SHALL PERFORM AN ACCURATE AND COMPLETE BALANCE OF AIR SYSTEMS AS A PART OF THIS CONTRACT, WHICH SHALL BE COMPLETED BEFORE FINAL ACCEPTANCE OF THE WORK OF THIS CONTRACT. AIR BALANCING SHALL BE SUBCONTRACTED TO A CERTIFIED MEMBER OF ASSOCIATED AIR BALANCE COUNCIL.

15700 HVAC AIR DISTRIBUTION AND RETURN SYSTEMS

- A. PROVIDE AND INSTALL DUCTWORK AND PLENUMS OF SIZE AND LOCATION AS SHOWN ON DRAWINGS. ALL DUCTS FOR AIR VELOCITIES LESS THAN 2000 FPM AND STATIC PRESSURE IN DUCT 2" OR LESS SHALL BE CONSTRUCTED OF GALVANIZED SHEET METAL. THE GAUGE OF STEEL USED IN ALL DUCTS SHALL BE AS FOLLOWS:
 - 1) WHERE GREATER RECTANGULAR DIMENSION IS 12" OR LESS USE 26 GAUGE.
 - 2) WHERE GREATER RECTANGULAR DIMENSION IS FROM 12" THROUGH 30" USE 24 GAUGE.
 - 3) WHERE GREATER RECTANGULAR DIMENSION IS FROM 31" THROUGH 54" USE 22 GAUGE.
 - 4) WHERE GREATER RECTANGULAR DIMENSION IS FROM 55" THROUGH 64" USE 20 GAUGE.
- B. TRANSVERSE JOINTS AND BRACING TO CONFORM TO "HVAC CURR CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" (CURRENT SMACNA).
- C. ALL DUCTS SHALL BE RIGID AND SHALL BE CROSS-BROKEN, PROPERLY STIFFENED WITH SUITABLE BRACES, TOES, OR ANGLES TO KEEP THEM TRUE TO SHAPE AND PREVENT BUCKLING. ALL VERTICAL DUCTS SHALL BE OF STRONG ENOUGH CONSTRUCTION TO CARRY 100 LBS. SUSPENDED LOAD FROM HANGERS WITHOUT BUCKLING. SOLDER ALL JOINTS WHERE NECESSARY TO INSURE TIGHT WORK. SEAMS OF ALL DUCTS AND JOINTS SHALL BE HAMMERED TO A SMOOTH SURFACE ON THE INSIDE. SEAMS ON OUTDOOR DUCTS SHALL BE MADE WATERTIGHT. LINE ALL SUPPLY AND RETURN RECTANGULAR AIR DUCTS WITH RIGID DUCT LINER WITHIN MINIMUM INSTALLED R-VALUE OF 5.0.
- D. CONSTRUCTION INCLUDING HANGERS AND SUPPORTING SYSTEMS OF ALL DUCTWORK SHALL ALSO BE IN ACCORDANCE WITH "HVAC CURR CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" (CURRENT SMACNA).
- E. FLEXIBLE CONNECTIONS SHALL BE INSTALLED ON THE OUTLET AND INTAKE OF AIR HANDLING UNITS AND FANS. THESE CONNECTIONS SHALL BE AT LEAST 6' LONG, MADE OF NFPA 90A APPROVED FLAMEPROOF FABRIC.
- F. FURNISH AND INSTALL VOLUME CONTROLLER AND EXTRACTOR AT ALL BRANCH TAKEOFFS IN SUPPLY AND RETURN FROM MAIN DUCTS TO ALL BRANCH DUCTS WHERE SHOWN. UNIT SHALL BE OF TWO GAUGES HEAVIER THAN THE DUCT.
- G. PROVIDE MANUAL ADJUSTING LEVER FOR EACH UNIT. UNITS SHALL MOVE FROM FULL OPEN TO FULLY CLOSED POSITION TO CONTROL AIR DIRECTION AND VOLUME.
- H. FURNISH AND INSTALL TURNING VANES IN ALL ELBOWS OF RECTANGULAR DUCTS. THE BLADES TO BE HOLLOW-FORMED DOUBLE THICKNESS VANES.
- I. FURNISH AND INSTALL SUPPLY, RETURN, AND EXHAUST REGISTERS, GRILLES AND DIFFUSERS AS SHOWN ON THE DRAWINGS AND SCHEDULE.
- J. FLEXIBLE SUPPLY AIR DUCTWORK WITH 1" THICK FIBERGLASS BLANKET INSULATION WITH METALIZED FILM VAPOR BARRIER OUTER JACKET. FLEXIBLE DUCT IN RETURN AIR PLENUM TO BE CLEARLY LABELED "CLASS 1" EVERY FOUR FEET. FLEXIBLE DUCT LENGTH MAY NOT EXCEED FIVE FEET.
- K. DUCT LINER SHALL BE 1-1/2 LB. ACOUSTICAL DUCT LINER. THE SURFACE FACING THE AIRSTREAM SHALL BE TREATED WITH A NON-COMBUSTIBLE COATING TO PREVENT AIR EROSION AND NOT SUPPORT MICROBIAL GROWTH.

15792 SPLIT SYSTEM UNITS

- A. CONSTRUCTION. STEEL CABINET, FILTERS, GAS FIRED HEAT EXCHANGER, OPERATORS AND CONTROLS.
- B. BLOWER: EVAPORATOR BLOWER TO BE DIRECT DRIVE CENTRIFUGAL, DYNAMICALLY BALANCED, MULTI-BLADE, FORWARD CURVED, CLASS 1.
- C. DX SYSTEM: FULLY HERMETIC COMPRESSORS WITH CRANKCASE HEATERS, INTERNAL THERMAL OVERLOAD, SINGLE REFRIGERATION CIRCUIT AND HEAD PRESSURE CONTROLS. COMPRESSOR TO HAVE FIVE (5) YEAR WARRANTY.
- D. HIGH EFFICIENCY DIRECT VENT SEALED COMBUSTION, WITH A POLYPROPYLENE LAMINATED HEAT EXCHANGER. PROVIDE WITH HOT SURFACE IGNITER.
- E. HEATER AND OVER TEMPERATURE PROTECTION-PRIMARY SHALL BE BUILT IN AUTOMATIC RESET THERMAL CUTOFFS. SECONDARY SHALL BE AN INDEPENDENT MANUAL RESET THERMAL CUTOFFS. PROVIDE AIR FLOW SWITCH TO DEENERGIZE HEATER ON LOSS OF AIR FLOW. UL LISTED AND UL APPROVED.
- F. CONTROLS -
 - 1) CONTROLS - FACTORY INSTALLED AND WIRED. FAN ON-OFF CONTROL, MANUAL RESET HIGH LIMIT RESET.
 - 2) INDOOR FAN RELAY - FACTORY INSTALLED.
 - 3) PROVIDE WITH SLOW OPENING REDUNDANT GAS VALVE.
 - 4) PROVIDE AUXILIARY CONTACTS FOR REQUIRED INTERLOCKS.
 - 5) PROVIDE HONEYWELL THERMOSTAT WITH SEVEN DAY PROGRAMMING, AUTOMATIC CHANGEOVER, HEATING, COOLING AND CLEAR LOCKING COVER.
- G. LIFTING AND PLACING OF UNITS SHALL BE BY HVAC CONTRACTOR.
- H. WIRE HEATERS TO ENERGIZE ONLY WHEN HVAC UNIT FAN STARTER IS ENERGIZED.
- I. COORDINATE LOCATION OF CONDENSING UNITS WITH THE GENERAL CONTRACTOR. UNITS TO BE INSTALLED ON CONCRETE PADS PROVIDED BY THIS CONTRACTOR.
- J. INSTALL TRAPPED DRAIN LINE FROM DRAIN PANS TO NEAREST FLOOR DRAIN OR POP SINK.
- K. MOUNT AND WIRE UNIT CONTROLS.
- L. MOUNT SPLIT SYSTEM UNITS REFRIGERANT PIPING ON PIPE SUPPORTS NEATLY RACKED. SEAL WALL PENETRATIONS AIR AND WATER TIGHT.
- M. ROOF PENETRATIONS TO BE MADE WEATHERTIGHT.
- N. ELECTRICAL CONTRACTOR TO MAKE POWER CONNECTIONS TO UNITS.
- O. HVAC CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL CONTROLS, CONTROL WIRING AND TO MAKE OPERATIONAL.
- P. CONDENSING UNITS AND AIR HANDLER UNITS SHALL BE CARRIER. EQUAL UNITS BY TRANE, YORK, OR LENOX MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.

15793 COMPUTER ROOM UNIT

- A. INDOOR, WALL MOUNTED, DIRECT EXPANSION FAN COIL UNIT.
- B. FAN SHALL BE 3-SPEED CENTRIFUGAL, DIRECT DRIVE BLOWER TYPE WITH AIR INTAKE ON SIDE AND DISCHARGE AT THE BOTTOM.
- C. DX SYSTEM: FULLY HERMETIC COMPRESSORS WITH CRANKCASE HEATERS, INTERNAL THERMAL OVERLOAD, SINGLE REFRIGERATION CIRCUIT AND HEAD PRESSURE CONTROLS. COMPRESSOR TO HAVE FIVE (5) YEAR WARRANTY.
- D. CONTROLS -
 - 1) CONTROLS - FACTORY INSTALLED AND WIRED. FAN ON-OFF CONTROL, MANUAL RESET HIGH LIMIT RESET.
 - 2) INDOOR FAN RELAY - FACTORY INSTALLED.
 - 3) PROVIDE AUXILIARY CONTACTS FOR REQUIRED INTERLOCKS.
 - 4) PROVIDE WITH WALL MOUNTED THERMOSTAT BY MANUFACTURER.
- E. MOUNTING OF UNITS SHALL BE BY HVAC CONTRACTOR.
- F. COORDINATE LOCATION OF CONDENSING UNITS WITH THE GENERAL CONTRACTOR. UNITS TO BE INSTALLED ON CONCRETE PADS PROVIDED BY THIS CONTRACTOR. SECURE TO ROOF PER MANUFACTURER'S INSTRUCTIONS.
- G. INSTALL TRAPPED DRAIN LINE FROM DRAIN PANS TO NEAREST FLOOR DRAIN.
- H. MOUNT AND WIRE UNIT CONTROLS.
- I. SPLIT SYSTEM UNITS REFRIGERANT PIPING ON PIPE SUPPORTS NEATLY RACKED. SEAL ALL PENETRATIONS AIR AND WATER TIGHT.
- J. ROOF PENETRATIONS TO BE MADE WEATHERTIGHT.
- K. ELECTRICAL CONTRACTOR TO MAKE POWER CONNECTIONS TO UNITS.
- L. HVAC CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL CONTROLS, CONTROL WIRING AND TO MAKE OPERATIONAL.
- M. CONDENSING UNITS AND FAN COIL UNITS SHALL BE CARRIER. EQUAL UNITS BY TRANE, SANYO, OR MITSUBISHI MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.

15800 REFRIGERANT PIPING SYSTEM

- A. PIPE TYPE L-ACR HARD DEHYDRATED SCALE FREE COPPER TUBING. FITTINGS WROUGHT COPPER, SOLDER TYPE.
- B. SHUT-OFF VALVES IN REFRIGERANT LINES SHALL BE SIMILAR TO HENRY, BALANCED-ACTING DIAPHRAGM TYPE WITH BRASS BODY WITH SOLDER TYPE ENDS.
- C. PROPERLY CLEAN ENDS OF ALL TUBING BEFORE SOLDERING. ALL JOINTS SHALL BE MADE WITH "SILFOSS".
- D. DURING CONSTRUCTION, THIS CONTRACTOR SHALL TAKE PRECAUTION TO MINIMIZE CONTAMINATION OF SYSTEM BY DIRT, SCALE, MOISTURE OR OTHER FOREIGN MATTER. ALL FOREIGN MATERIAL AND MOISTURE IN THE SYSTEM SHALL BE REMOVED.
- E. THIS CONTRACTOR SHALL PROVIDE OIL FOR COMPRESSOR AND PROPER REFRIGERANT CHARGE FOR THE SYSTEM.

15905 AIR DISTRIBUTION DEVICES

- A. STEEL RETURN AIR OR EXHAUST REGISTER - STEEL GRILLE WITH 35 DEGREE LOUVERS PARALLEL TO LONG DIMENSION. GASKET, FLANGE, 3/4" LOUVER SPACING AND VOLUME CONTROL DAMPER. TITUS 350RL.
- B. SQUARE CEILING SUPPLY AIR DIFFUSER - STEEL SQUARE CEILING DIFFUSER, CONCENTRIC CONTROL DAMPER, CONCENTRIC CONTROL TABS, REMOVABLE INNER CONE ASSEMBLY, ROUND NECK, VOLUME CONTROL DAMPER, EQUALIZING GRID. TITUS TMS.
- C. STEEL SIDEWALL SUPPLY OR RETURN AIR REGISTER - STEEL GRILLE WITH 35 DEGREE LOUVERS PARALLEL TO LONG DIMENSION, GASKET, FLANGE, 3/4" LOUVER SPACING AND VOLUME CONTROL DAMPER. TITUS 300 FL.
- D. FINISHES - FURNISH ALL AIR DISTRIBUTION DEVICES WITH PRIME COATED AND WHITE BAKED ENAMEL FINISH COAT UNLESS SPECIFIED OTHERWISE.
- E. COORDINATE AIR DISTRIBUTION DEVICE LOCATIONS WITH ALL AFFECTED CONTRACTORS BEFORE INSTALLING DUCTWORK. SIGNIFICANT DEVIATIONS IN LOCATIONS FROM THOSE SHOWN ON THE DRAWINGS MUST BE APPROVED BY ARCHITECT BEFORE INSTALLATION.
- F. SUSPEND CEILING AIR DEVICES FROM STRUCTURE ON WIRE HANGERS OR FROM RIGID DUCTWORK. CEILING MUST NOT BE USED TO SUPPORT AIR DISTRIBUTION DEVICES.
- G. SECURELY FASTEN SIDE WALL AIR DEVICES TO RIGID DUCTWORK OR STRUCTURE.
- H. AIR DISTRIBUTION DEVICES SHALL BE TITUS. EQUAL PRODUCT BY METAL-AIRE, ANEMOSTAT, NAILOR, OR BARBER-COLEMAN MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.

15915 DAMPERS

- A. RECTANGULAR DUCT GALVANIZED STEEL MANUAL BALANCE AND MOTORIZED DAMPER 6" WIDE 16 GAUGE OPPOSED BLADES, CHANNEL FRAME WITH BRACED CORNERS, CONCEALED LINKAGE, TEFLON FILLED BEARINGS, 3/8" DIAMETER AXLE, 6" LONG CONTROL SHAFT, MOTORIZED DAMPER TO HAVE REPLACEABLE BUTYL RUBBER SEALS INSTALLED ALONG THE TOP, BOTTOM AND SIDES OF THE FRAME, AS WELL AS, ALONG ALL SIDES OF EACH BLADE.
- B. ROUND GALVANIZED STEEL MANUAL BALANCE DAMPER WITH SINGLE 16 GAUGE BLADE, CHANNEL FRAME, STAINLESS STEEL LABELED FLEXIBLE LINKS PRESSED INTO FRAME, 3/8" DIAMETER AXLE EXTENDED 6" FOR CONTROL SHAFT, BLADE STOP.
- C. EQUIP DAMPERS WITH LOCKING QUADRANTS.
- D. CHECK DAMPERS FOR PROPER OPERATION BEFORE AND AFTER INSTALLATION.
- E. INSTALL BALANCE DAMPERS WHERE SHOWN ON THE DRAWINGS AND ELSEWHERE AS NECESSARY TO OBTAIN PROPER SYSTEM BALANCE.
- F. DAMPERS SHALL BE RUSKIN. EQUAL PRODUCT BY AMERICAN WARNING AND VENTILATING, LCOVERS AND DAMPERS, OR PREFCO MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.
- G. FIRE DAMPERS SHALL BE FURNISHED WITH INTERLOCKING HINGED BLADES. ALL DAMPERS SHALL BE UL APPROVED AND LABELED AND SHALL MEET ALL REQUIREMENTS OF NFPA NO. 90A. FURNISH WITH UL LABELED FLEXIBLE LINKS WITH TEMPERATURE RANGES TO CONFORM TO NFPA REQUIREMENTS.
 - 1) ALL FIRE DAMPERS SHALL BE TYPE "B" WITH BLADES OUT OF THE AIRSTREAM AND RATED FOR USE IN DYNAMIC SYSTEMS.

15920 DRAIN AND CONDENSATION DRAIN PIPING

- A. FURNISH AND INSTALL A GRAVITY CONDENSATION DRAIN PIPING SYSTEM, TERMINATING AT THE NEAREST DRAIN.
- B. PIPING IS TO BE SCHEDULE 40 PVC WITH DRAINAGE PATTERN FITTINGS, BONDED ACCORDING TO THE MANUFACTURERS RECOMMENDATIONS.
- C. PIPING IS TO BE SECURED TO PIPE HANGERS, USING PROPER SPACING AND THE APPROPRIATE HEIGHT TO ALLOW THE PIPE TO PITCH PROPERLY.

15939 CEILING EXHAUST FANS

- A. CEILING EXHAUST FANS BASED ON COOK SHALL BE OF THE CENTRIFUGAL DIRECT DRIVE TYPE. THE FAN HOUSING SHALL BE CONSTRUCTED OF HEAVY GAUGE GALVANIZED STEEL. THE EXHAUST INTERIOR SHALL BE LINED WITH 1/2" ACOUSTICAL INSULATION. THE OUTLET DUCT COLLAR SHALL INCLUDE AN ALUMINUM BACKDRAFT DAMPER AND SHALL BE ADAPTABLE FOR HORIZONTAL DISCHARGE.
- B. THE ACCESS FOR WIRING SHALL BE EXTERNAL. THE MOTOR DISCONNECT SHALL BE INTERNAL AND OF THE PLUG TYPE.
- C. THE MOTOR SHALL BE MOUNTED ON VIBRATION ISOLATORS. THE FAN WHEEL SHALL BE OF THE FORWARD CURVED CENTRIFUGAL TYPE AND DYNAMICALLY BALANCED.
- D. ALL FANS SHALL BEAR THE AMCA CERTIFIED RATINGS SEAL FOR SOUND AND AIR PERFORMANCE AND SHALL BE U.L. LISTED AND C.S.A. APPROVED. CAPACITIES AS SHOWN ON THE DRAWINGS.
- E. WIRING BY THE ELECTRICAL CONTRACTOR.
- F. FANS SHALL BE LOREN COOK. EQUAL PRODUCT BY ACME, GREENHECK, PENN, BROAN, OR JENN-AIR MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.

15975 INSULATION

- A. DUCT INSULATION AND APPURTENANCES SHALL HAVE A FLAME SPREAD RATING NOT EXCEEDING TWENTY-FIVE (25) AND A SMOKE DEVELOPED RATING NOT EXCEEDING FIFTY (50).
- B. CONCEALED ROUND DUCTWORK - FLEXIBLE FIBERGLASS DUCT WRAP LAMINATED TO FOIL REINFORCED KRAFT VAPOR BARRIER FACING WITH 2" STAPLING FLANGE, 1.0 PCF DENSITY, K-0.27. OWENS-CORNING COMMERCIAL GRADE FIBERGLASS DUCT WRAP TYPE 100.
- C. INSULATION THICKNESS

DUCT TYPE	THICKNESS	R-VALUE
BELOW THERMAL BARRIER	2"	5.0
ABOVE THERMAL BARRIER	2"	7.4

PIPE TYPE	THICKNESS	R-VALUE
CONDENSATION	1"	6.5
- D. INSULATION SHALL NOT BE APPLIED UNTIL THE GENERAL CONSTRUCTION HAS PROGRESSED SUFFICIENTLY TO INSURE AGAINST PHYSICAL OR MOISTURE DAMAGE TO THE INSULATION. ALL INSULATION DAMAGED THROUGH FAILURE TO OBSERVE THIS DIRECTIVE SHALL BE REPLACED AT HVAC CONTRACTOR'S EXPENSE.
- E. HANGER RODS MUST BE PERPENDICULAR TO DUCTWORK BEFORE INSULATION IS INSTALLED.
- F. INSTALL ALL INSULATION ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
- G. INSULATION SHALL BE APPLIED OVER FLANGES, JOINTS AND SEAMS IN PIPING AND DUCTWORK.
- H. ALL JOINTS AND SEAMS IN INSULATION SHALL BE PROPERLY SEALED TO MAINTAIN VAPOR BARRIER INTEGRITY.
- I. INSULATION SHALL HAVE A MINIMUM INSTALLED R-VALUE OF 5 AND A MINIMUM THICKNESS OF 2". INSULATION INSTALLED OUTSIDE THE BUILDING THERMAL BARRIER SHALL HAVE A MINIMUM R-VALUE OF 7.4 AND A MINIMUM THICKNESS OF 2".
- J. INSULATION SHALL BE OWENS-CORNING. EQUAL PRODUCT BY ARMSTRONG, CERTAINTED, SCHULLER OR KNAUF MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.

15975 BALANCING

- A. ALL AIR DISTRIBUTION SYSTEMS ARE TO BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS, SUCH AS THE ASSOCIATED AIR BALANCE COUNCIL (AABC). DUCTED AIR RATES ARE TO BE MEASURED AND ADJUSTED TO DELIVER FINAL FLOW RATES WITHIN 10% OF DESIGN RATES.

brandpartners

SPECIFICATIONS
BrandPartners Group, Inc.
10 Main Street
Rochester, NH 03839
Phone: 603.335.1400
Fax: 603.335.1765

ENGINEER



SHREMSHOCK
ENGINEERING, INC.

6130 S. Sunbury Road
Westerville, OH 43081
(614)545-4550 p
(614)545-4555 f
info@shremshock.com
www.shremshock.com

SAI 07239

TITLE

HVAC

SCALE

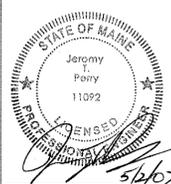
NONE

CLIENT

UNIVERSITY
CREDIT UNION

1071 BRIGHTON AVENUE
PORTLAND, ME 04102

SIGNATURE
DATE



INFO

PATH:

ISSUE DATE: 05-01-07

DRAWN BY: WRG

CHECKED BY: JTP

REVISION:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.

© 2005 BrandPartners Inc. All rights reserved. Information, material, and designs in this document are proprietary to and owned by BrandPartners Inc. and may not be disclosed to any third party, reproduced, posted on a global computer information network, or distributed in any way without the written consent from BrandPartners Inc.

H6.1