### MECHANICAL SPECIFICATIONS

### 1. GENERAL PROVISIONS:

- A. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, NECESSARY FOR THE COMPLETE INSTALLATION OF THE PLUMBING AND MECHANICAL SYSTEMS OUTLINED
- B. OBTAIN ALL PERMITS, FEES, LICENSES, INSPECTIONS, AND CERTIFICATES OF COMPLIANCE OR APPROVAL AS REQUIRED BY THE AUTHORITIES.
- C. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE LAWS, CODES AND REGULATIONS OF THE GOVERNMENTAL BODIES HAVING JURISDICTION OVER THE SITE.
- D. ALL TESTING REQUIRED BY AUTHORITIES SHALL BE CONSIDERED PART OF THIS WORK.
- E. DURING CONSTRUCTION, ALL FIXTURES, EQUIPMENT, PIPE, DUCT, ETC. SHALL BE COVERED, PLUGGED, OR CAPPED AS REQUIRED TO KEEP CLEAN AND UNDAMAGED. ALL DAMAGED ITEMS SHALL BE RESTORED TO ORIGINAL CONDITION OR REPLACED. ALL PROTECTIVE COVERING SHALL BE REMOVED BEFORE FINAL ACCEPTANCE
- F. PROVIDE ALL NECESSARY CUTTING AND PATCHING OF WALLS, FLOORS, CEILINGS, AND ROOFS AS NECESSARY. PATCH AROUND ALL OPENINGS SHALL MATCH ADJACENT AREA. COORDINATE ALL ROOFING WORK WITH OWNER OR RESPONSIBLE PARTY, SO THAT THE EXISTING ROOFING WARRANTY WILL BE MAINTAINED.
- G. CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS AGAINST DEFECTS FOR A PERIOD OF ONE YEAR FROM FINAL ACCEPTANCE.

### 2. OPERATION AND MAINTENANCE MANUALS:

- A. DURING THE COURSE OF CONSTRUCTION, COLLECT AND COMPILE OPERATING INSTRUCTIONS, WIRING DIAGRAMS, CATALOG CUTS, LUBRICATION AND PREVENTIVE MAINTENANCE INSTRUCTIONS, PARTS LISTS, ETC. FOR ALL EQUIPMENT FURNISHED UNDER THIS CONTRACT.
- B. ALL LITERATURE AND INSTRUCTIONS SHIPPED WITH THE EQUIPMENT SHALL BE SAVED FOR INCLUSION IN THE OPERATION AND MAINTENANCE MANUALS.
- C. ALL LITERATURE LISTED ABOVE AND ALL PAPERS LISTING WARRANTIES, ETC. SHALL BE BOUND IN A 3-RING BINDER AND LABELED WITH THE PROJECT NAME, ADDRESS, ARCHITECT, ENGINEER, CONTRACTORS, ETC.

### 3. MANUFACTURERS:

A. MANUFACTURERS, MODEL NUMBERS, ETC. INDICATED OR SCHEDULED ON THE DRAWINGS SHALL BE INTERPRETED AS HAVING ESTABLISHED A STANDARD OF QUALITY AND SHALL NOT BE CONSTRUED AS LIMITING COMPETITION. ARTICLES, FIXTURES, ETC. OF EQUAL QUALITY BY MANUFACTURERS SHALL BE ACCEPTABLE, SUBJECT TO STRUCTURAL AND ELECTRICAL CONSTRAINTS OF THE PROJECT DESIGN, UNLESS NOTED OTHERWISE

### 4. MOTORS:

A. PROVIDE THERMAL OVERLOAD PROTECTION FOR EACH MOTOR PROVIDED BY THIS WORK.

### 5. TESTING, BALANCING, AND CLEANING:

- A. ALL PIPING SHALL BE TESTED FOR LEAKS BEFORE BEING CONCEALED IN WALL CONSTRUCTION OR COVERED WITH INSULATION.
- B. SEWER AND VENT PIPING SHALL BE HYDROSTATICALLY TESTED WITH NO LESS THAN 10 FEET OF HEAD FOR A PERIOD OF NOT LESS THAN 15 MINUTES, PER THE LOCAL PLUMBING CODE, WITH NO LEAKS.
- C. DOMESTIC WATER PIPING SHALL BE HYDROSTATICALLY TESTED AT A PRESSURE OF NOT LESS THAN 1-1/2 TIMES THE OPERATING PRESSURE, BUT NOT LESS THAN 60 PSI, FOR A PERIOD OF NOT LESS THAN 2 HOURS WITH NO LEAKS.
- D. PROPANE GAS PIPING SHALL BE PNEUMATICALLY TESTED AT A PRESSURE OF NOT LESS THAN 1-1/2 TIMES THE OPERATING PRESSURE, BUT NOT LESS THAN 50 PSI, FOR A PERIOD OF NOT LESS THAN 2 HOURS, WITH NO LEAKS.
- E. DUCTWORK AND PIPING SHALL BE BALANCED BY QUALIFIED BALANCING PERSONNEL WHO HAVE PREVIOUS EXPERIENCE WITH BALANCING PROCEDURES.
- F. BEFORE DOMESTIC WATER PIPING IS PLACED IN SERVICE, ALL DOMESTIC WATER DISTRIBUTION SYSTEMS, INCLUDING THOSE FOR COLD WATER AND HOT WATER SYSTEMS, SHALL BE FLUSHED, STERILIZED AND CHLORINATED IN ACCORDANCE WITH HEALTH DEPARTMENT REGULATIONS. THE SYSTEMS SHALL BE THOROUGHLY FLUSHED OF ALL DIRT AND FOREIGN MATTER, THEN FILLED WITH WATER TREATED WITH 50 PPM OF CHLORINE. DURING THE FILLING PROCESS VALVES AND FAUCETS SHALL BE OPENED SEVERAL TIMES TO ASSURE TREATMENT OF THE ENTIRE SYSTEM. THE TREATED WATER SHALL BE LEFT IN THE SYSTEM FOR 24 HOURS AFTER WHICH TIME THE SYSTEM SHALL BE FLUSHED; IF THE RESIDUAL CHLORINE IS NOT LESS THAN 10 PPM. THE FLUSHING SHALL BE REPEATED. AFTER STERILIZATION. SAMPLES OF WATER IN THE SYSTEM SHALL BE APPROVED BY THE BOARD OF HEALTH.

### 6. PLUMBING

- A. PROVIDE AN APPROVED WATER HAMMER ARRESTOR FOR EACH PLUMBING FIXTURE SUPPLY AS REQUIRED BY FIXTURE MANUFACTURER.
- B. ALL EXPOSED WASTE PIPE SHALL BE CHROME PLATED BRASS PIPE, NO FERROUS PIPE.
- 2. PROVIDE CLEANOUTS AT EACH CHANGE OF DIRECTION AND AT 100 FOOT INTERVALS IN STRAIGHT RUNS.
- D. PROVIDE ACCESS PANELS FOR ALL CONCEALED VALVES AND TRAPS.

### E. CLEANOUTS:

- 1) VINYL TILE FLOOR: JR SMITH #4140, OR EQUAL.
- 2) QUARRY TILE FLOOR: JR SMITH #4200, OR EQUAL 3) CARPETED FLOOR: JR SMITH #4020-Y, OR EQUAL.
- 4) UNFINISHED FLOOR: JR SMITH #4020, OR EQUAL. 5) WALL: JR SMITH #4472, OR EQUAL, 24" ABOVE THE FLOOR.
- 6) GRADE: JR SMITH #4256, OR EQUAL, WITH HEAVY DUTY CAST IRON BODY AND COVER.
- F. PROVIDE DIELECTRIC UNIONS WITH APPROPRIATE END CONNECTIONS TO MATCH THE PIPE SYSTEM IN WHICH INSTALLED (SCREWED, SOLDERED, OR FLANGED). PROVIDE DIELECTRIC UNIONS ON ALL PIPING CONNECTIONS TO HOT WATER HEATERS AND EXPANSION TANKS.

### G. WATER HEATERS:

- 1) BOTTOM FED WATER HEATERS AND TANKS CONNECT TO WATER HEATERS SHALL HAVE A VACCUM RELIEF VALVE INSTALLED, ANSI Z21.22. 2) STORAGE HEATERS OPERATING ABOVE ATMOSPHERIC PRESSURE SHALL HAVE AN APPROVED
- PRESSURE RELIEF VALVE AND/OR TEMPERATURE RELIEF VALVE. H. ALL SEWER PIPING LOCATED INSIDE THE BUILDING SHALL BE INSTALLED WITH THE FOLLOWING SLOPES.

### 1) INSTALL 2-1/2" AND SMALLER PIPE AT 1/4" PER FOOT FALL. 2) INSTALL 3" AND LARGER PIPE AT 1/8" PER FOOT FALL.

- I. ALL SEWER PIPING LOCATED EXTERIOR TO THE BUILDING SHALL BE INSTALLED WITH THE FOLLOWING SLOPES.
- 1) INSTALL 4" AND SMALLER PIPE AT A MINIMUM OF 2% SLOPE.

### 2) INSTALL 6" AND LARGER PIPE AT A MINIMUM OF 1% SLOPE.

### 7. PIPING:

- A. DOMESTIC COLD AND HOT WATER (ABOVEGROUND).
- 1) TYPE L HARD DRAWN COPPER TUBING, ASTM B-88. a) WROUGHT COPPER SOLDERED FITTINGS, ASTM B75 ALLOY C12200. ANSI B16.22. MSS SP-104. b) MECHANICAL PRESS COPPER FITTINGS FOR USE IN PLUMBING OR MECHANICAL APPLICATIONS. ASME B16.22,
- ASME B16.51, OF ASME B16.18. MECHANICAL PRESS COPPER FITTINGS SHALL CONFORM TO IAPMO PS-117 OR ASME B16.51. 2) PEX, HIGH-DENSITY CROSS-LINKED POLYETHYLENE TUBING SHALL BE MANUFACTURED TO THE
- REQUIREMENTS OF ASTM F876 AND MEET THE STANDARD GRADE HYDROSTATIC PRESSURE RATINGS FROM PLASTIC PIPE INSTITUTE IN ACCORDANCE WITH TR-4/03.
- (MUST BE INSTALLED PER THE MANUFACTURERS REQUIREMENTS FOR PLENUM USE)
- a) PEX-A AND PEX-B MEETING ANSI/NSF61 AND ANSI/NSF372 STANDARDS FOR POTABLE WATER SAFETY AND LEAD-FREE STANDARDS AND MUST BE MARKED WITH "PW-G", "NSF-61-G" OR OTHER NSF-APPROVED MARKING. ASTM F2023 FOR USE WITH CHLORINATED WATER.
- (MUST BE INSTALLED PER THE MANUFACTURERS REQUIREMENTS FOR PLENUM USE) b) PEX MECHANICAL, CRIMP/INSERT OR EXPANSION FITTINGS INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. PIPE SIZES GIVEN ON THE DRAWINGS ARE NOMINAL COPPER PIPE SIZE, INCREASE PEX PIPING SIZE TO EQUAL OR EXCEED COPPER PIPE INSIDE DIAMETER FOR SUPPLY MAINS. (MUST BE INSTALLED PER THE MANUFACTURERS REQUIREMENTS FOR PLENUM USE)

### 3) VALVES a) TO BE INSTALLED ON THE FIXTURE SUPPLY TO EACH PLUMBING FIXTURE.

- b) TO BE INSTALLED ON THE WATER SUPPLY SIDE TO EACH APPLIANCE OR MECHANICAL EQUIPMENT. c) TYPES:
- 1. GATE VALVE: JOMAR T/S-301G OR EQUAL. LEAD-FREE NSF 61, ANSI B1.20.1
- 2. GLOBE VALVE: JOMAR TGG OR EQUAL. 3. BALL VALVE: JOMAR JP100PXP OR EQUAL COMPACT LEAD FREE BRASS BALL VALVE.
- UL842, CSA 3371-12 & 3371-92, FM, CALIFORNIA CODE AB1953, NSF61 ANNEX G APPROVED. 4. BALL VALVE: JOMAR T-100NE OR EQUAL. UL842, FM, CSA, NSF 61-8, MSS SP-110

### B. DOMESTIC WATER SERVICE

- 1) TYPE K SOFT DRAWN COPPER TUBING, ASTM B-88. a) Cast Copper Alloy Fittings for Flared Copper Tube, ASME/ANSI B16.26:
- 2) HDPE, PIGMENTED BLUE THROUGHOUT, CTS SIZES 1"-2" AWWA C901 4710 DR9 PC250 IPS SIZES 2"-3". AWWA C901 4710 DR11 PC200
- MATERIAL AND INSTALLATION MUST CONFORM TO WATER DEPARTMENT REQUIREMENTS. C. LEAD CONTENT OF WATER SUPPLY PIPE AND FITTINGS:
- 1) PIPE AND PIPE FITTINGS, INCLUDING VALVES AND FAUCETS, UTILIZED IN THE WATER SUPPLY SYSTEM SHALL NOT HAVE MORE THAN 8% LEAD CONTENT.
- 2) PIPE, PIPE FITTINGS, JOINTS, VALVES, FAUCETS, AND FIXTURE FITINGS UTILIZED TO SUPPLY WATER FOR DRINKING OR COOKING PURPOSES SHALL COMPLY WITH NSF 372 AND SHALL HAVE A WEIGHTED AVERAGE LEAD CONTENT OF 0.25% OR LESS.

### D. SANITARY SEWER AND VENTS. (UNDERGROUND, INTERIOR TO THE BUILDING).

- 1) ABS SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DWV FITTING SYSTEM: PIPE AND 32222 FOR FITTINGS AS PER ASTM D 3965 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 628
- FITTINGS SHALL CONFORM TO ASTM D 2661. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2235. 2) PVC SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DWV FITTING SYSTEM: PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 11432 PER ASTM D 4396 FOR PIPE AND 12454 PER ASTM D 1784 FOR FITTINGS AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 891. INJECTION MOLDED FITTINGS SHALL CONFORM TO ASTM D 2665. FABRICATED FITTINGS
- SHALL CONFORM TO ASTM F 1866. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2564. 3) PVC SCHEDULE 40 SOLID WALL PIPE AND DWV FITTING SYSTEM: ASTM D 1784 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM D 1785 AND ASTM D 2665. INJECTION MOLDED FITTINGS SHALL CONFORM TO ASTM D 2665. FABRICATED FITTINGS SHALL CONFORM TO ASTM
- F 1866. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2564. 4) HUBLESS CAST IRON SOIL PIPE AND FITTINGS: HUBLESS CAST IRON PIPE AND FITTINGS SHALL BE 5) HUB AND SPIGOT CAST IRON SOIL PIPE AND FITTINGS: HUB AND SPIGOT CAST IRON PIPE AND FITTINGS
- SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 74. E. SANITARY SEWER AND VENTS.
- (ABOVE GROUND, INTERIOR TO THE BUILDING). 1) ABS SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DWV FITTING SYSTEM: PIPE AND 32222 FOR FITTINGS AS PER ASTM D 3965 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 628 FITTINGS SHALL CONFORM TO ASTM D 2661. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2235.
- (NOT FOR USE IN A RETURN AIR PLENUM) 2) PVC SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DWV FITTING SYSTEM: ASTM D 4396 FOR PIPE AND 12454 PER ASTM D 1784 FOR FITTINGS AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 891. INJECTION MOLDED FITTINGS SHALL CONFORM TO ASTM D 2665. FABRICATED FITTINGS SHALL CONFORM TO ASTM F 1866. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2564.
- (NOT FOR USE IN A RETURN AIR PLENUM) 3) PVC SCHEDULE 40 SOLID WALL PIPE AND DWV FITTING SYSTEM: PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 12454 PER ASTM D 1784 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM D 1785 AND ASTM D 2665. INJECTION (NOT FOR USE IN A RETURN AIR PLENUM)
- SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 74.

### F. SANITARY SEVER. (UNDERGROUND, EXTERIOR TO THE BUILDING).

- ABS SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DWV FITTING SYSTEM PIPE AND FITTINGS SHALL BE MANUFACTURED FROM ABS COMPOUND WITH A CELL CLASS OF 42222 FOR PIPE AND 32222 FOR FITTINGS AS PER ASTM D 3965 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 2680
- 2) PVC SCHEDULE 40 CELLULAR CORE (FOAM CORE) PIPE AND DWV FITTING SYSTEM: ASTM D 4396 FOR PIPE AND 12454 PER ASTM D 1784 FOR FITTINGS AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 891. INJECTION MOLDED FITTINGS SHALL CONFORM TO ASTM F 794. FABRICATED FITTINGS
- 3) PVC SCHEDULE 40 SOLID WALL PIPE AND DWV FITTING SYSTEM: ASTM D 1784 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE
- SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2564. 4) HUBLESS CAST IRON SOIL PIPE AND FITTINGS: HUBLESS CAST IRON PIPE AND FITTINGS SHALL BE
- 5) HUB AND SPIGOT CAST IRON SOIL PIPE AND FITTINGS: HUB AND SPIGOT CAST IRON PIPE AND FITTINGS
- COPPER DWV: DRAINAGE TUBE SHALL CONFORM TO ASTM B306, WROUGHT COPPER FITTINGS, ANSI B-16,29. 7) GALVANIZED STEEL PIPE, WITH MALLEABLE IRON, THREADED FITTINGS, DRAINAGE PATTERN FOR SEWERS
- SHALL CONFORM TO ASTM A 53. G. CONDENSATE DRAINS & INDIRECT WASTE (ABOVEGROUND)

### 1) DWV, WROUGHT COPPER, ANSI B-16.29 (CONDENSATE INSIDE BUILDING). H. REFRIGERANT.

- 1) ASTM B 280, TYPE ACR, HARD-DRAWN STRAIGHT LENGTHS, AND SOFT-ANNEALED COILS, SEAMLESS COPPER TUBING. 2) WROUGHT COPPER, ANSI B16.22, STREAMLINED PATTERN, FITTINGS. BRAZED JOINTS, AWS A 5.8,
- CLASSIFICATION BAG-1 (SILVER). 3) TUBING SHALL BE FACTORY CLEANED, READY FOR INSTALLATION, AND HAVE ENDS CAPPED TO
- PROTECT CLEANLINESS OF PIPE INTERIORS PRIOR TO SHIPPING. 4) SIZE AND INSTALLATION OF PIPE SHALL BE IN ACCORDANCE WITH MANUFACTURER'S

### . PROPANE GAS.

RECOMMENDATIONS.

- 1) BLACK STEEL PIPE, SCHEDULE 40, ASTM A53. a) PIPE 3" AND SMALLER; 150 LB. MALLEABLE IRON, THREADED FITTINGS.
- FOR USE WITH ASTM A53 SCHEDULE 40 BLACK IRON PIPE. c) PIPE 2-1/2" AND LARGER, WELDED.
- d) PLUG VALVE: ROCKWELL NORDSTROM FIGURE NO. 142 OR 143. e) BALL VALVE: JOMAR T-100NE. APPROVALS- UL842, FM, CSA, NSF 61-8, MSS SP-110 2) GAS PIPING PAINTING
- MATCH ADJACENT EXTERIOR WHERE LOCATED ON OR NEAR EXTERIOR WALL AND PAINTED SAFETY YELLOW WHERE LOCATED ON THE ROOF
- J. ALL PIPE HANGERS AND SUPPORTS SHALL BE STANDARD PRODUCTS OF GRINNELL, FEE AND MASON, OR ELCEN. HANGER SPACING SHALL BE IN ACCORDANCE WITH MSS-SP-69.

### K. SLEEVES

- 1) PROVIDE, SET, AND PROPERLY LOCATE PIPE SLEEVES AS REQUIRED FOR THIS WORK. ALL SLEEVES SHALL BE OF SUFFICIENT SIZE TO PERMIT PIPE MOVEMENT DUE TO EXPANSION AND CONTRACTION AND TO ACCOMMODATE PIPE INSULATION.
- 2) INTERIOR PARTITIONS: 16 GAGE GALVANIZED STEEL, PACK BETWEEN PIPE AND SLEEVE WITH FIRE SAFING AND CAULK AT EACH END WITH FIRE RESISTANT SEALANT.
- 3) ROOF: PROSET OR EQUAL, MANUFACTURED PVC SCHEDULE 40 PIPE SLEEVE WITH WATERPROOF SEAL.
- 4) PROTECTION AGAINST CONTACT: METALLIC PIPING, EXCEPT FOR CAST IRON, DUCTILE IRON AND GALVANIZED SHALL BE TWO SIZES GREATER THAN THE PIPE PASSING THOUGH THE WALL OR FOOTING.
- 5) PLUMBING VENTS: FLASH ROOF VENT INTO ROOFING SYSTEM AS REQUIRED BY THE ROOFING CONTRACTOR TO MAINTAIN EXISTING ROOF WARRANTY. ALL PLUMBING VENT TERMINALS SHALL TERMINATE A MINIMUM OF 12" ABOVE ROOF OR EQUAL TO HEIGHT OF PARAPET, WHICHEVER IS GREATER.
- L. PROVIDE CHROME PLATED ESCUTCHEONS ON ALL PIPE ENTERING FINISHED AREAS.

### MECHANICAL SPECIFICATIONS (CONTINUED)

# PIPE AND FITTINGS SHALL BE MANUFACTURED FROM ABS COMPOUND WITH A CELL CLASS OF 42222 FOR

PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 12454 PER

MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 888 AND CISPI STANDARD 301. HUBLESS COUPLINGS SHALL CONFORM TO CISPI STANDARD 310 AND BE CERTIFIED BY NSF® INTERNATIONAL.

PIPE AND FITTINGS SHALL BE MANUFACTURED FROM ABS COMPOUND WITH A CELL CLASS OF 42222 FOR

PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 11432 PER

MOLDED FITTINGS SHALL CONFORM TO ASTM D 2665. FABRICATED FITTINGS SHALL CONFORM TO ASTM F 1866. 10. DUCTWORK: SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2564. (WHERE APPROVED BY LOCAL JURISDICTIONS)

4) HUBLESS CAST IRON SOIL PIPE AND FITTINGS: HUBLESS CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 888 AND CISPI STANDARD 301. HUBLESS COUPLINGS SHALL CONFORM TO CISPI STANDARD 310 AND BE CERTIFIED BY NSF® INTERNATIONAL. HUB AND SPIGOT CAST IRON SOIL PIPE AND FITTINGS: HUB AND SPIGOT CAST IRON PIPE AND FITTINGS

FITTINGS SHALL CONFORM TO ASTM D 2680. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2235.

PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 11432 PER SHALL CONFORM TO ASTM F 1866. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2564.

PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 12454 PER SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM F 794. FITTINGS SHALL CONFORM TO ASTM F 794.

MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 888 AND CISPI STANDARD 301. HUBLESS COUPLINGS SHALL CONFORM TO CISPI STANDARD 310 AND BE CERTIFIED BY NSF® INTERNATIONAL. SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 74.

b) PIPE 4" AND SMALLER; VIEGA MEGAPRESS G FOR WATER AND GAS. CSA LC4, TSSA/ASME B31

a) ALL BLACK STEEL GAS PIPING LOCATED EXTERIOR TO THE BUILDING SHALL BE PRIMED AND PAINTED TO EITHER

COORDINATE WITH ROOFING CONTRACTOR AND FLASH AS REQUIRED TO MAINTAIN ROOF WARRANTY.

STEEL SHALL NOT BE PLACED IN DIRECT CONTACT WITH STEEL FRAMING MEMBERS, CONCRETE, OR CINDER WALLS AND FLOORS OR OTHER MASONRY. METALLIC PIPING SHALL NOT BE PLACED IN DIRECT CONTACT WITH CORROSIVE SOIL. SHEATHING USED TO PREVENT DIRECT CONTACT SHALL HAVE A THICKNESS OF GREATER THAN .008: AND THE SHEATHING SHALL BE MADE OF PLASTIC. ANY PIPE THAT PASSES THROUGH A FOUNDATION WALL OR FOOTING SHALL BE PROVIDED WITH A RELIEVING ARCH, OR A PIPE SLEEVE SHALL BE BUILT INTO THE FOUNDATION WALL. THE SLEEVE

# MECHANICAL SPECIFICATIONS (CONTINUED)

### 9. INSULATION AND DUCT LINING:

- A. ALL INSULATIONS AND ACCESSORIES SHALL HAVE A FIRE HAZARD CLASSIFICATION WITH A FLAME SPREAD RATING OF NOT OVER 25, A FUEL CONTRIBUTION RATING OF NOT OVER 50, AND A SMOKE DEVELOPED RATING OF NOT OVER 50 IN ACCORDANCE WITH NEPA
- B. PIPE INSULATION ABOVE GRADE:
- 1) THE PIPING INSULATION USED SHALL HAVE A THERMAL CONDUCTIVITY OF 0.27 Btu PER in/hr\*sqft\*F° OR LESS. 2) FIBERGLASS INSULATION WITH FACTORY APPLIED VAPOR BARRIER, ASJ JACKET, FACTORY APPLIED PRESSURE SEALING LONGITUDE LAP JOINT, NO STAPLES, ZESTON PREMOLDED PVC FITTING
- COVERS. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. 3) FLEXIBLE CLOSED CELL ELASTOMERIC THERMAL INSULATION, UNSLIT OR PRESLIT WITH PRESSURE SENSITIVE ADHESIVE SYSTEM FOR CLOSURE AND VAPOR SEALING, EQUAL TO ARMSTRONG AP ARMAFLEX OR ARMAFLEX 2000.
- 4) FOR NON CIRCULATING SYSTEMS, THE FIRST & FEET OF INLET AND OUTLET PIPING BETWEEN THE TANK AND THE HEAT TRAP (INCLUDING THE HEAT TRAP) MUST BE INSULATED.
- 5) FOR CIRCULATING SYSTEMS, ALL HOT WATER PIPING IN THE CIRCULATION LOOP MUST BE INSULATED AS SPECIFIED BELOW.
- 6) INSULATION SCHEDULE:
- a) DOMESTIC COLD WATER b) DOMESTIC HOT WATER c) REFRIGERANT SUCTION
- C. DUCTWORK: ACOUSTICAL INSULATION.
- 1) DUCT LINING: 2 LB/CF, THICKNESS AS SCHEDULED, AIR STREAM SIDE COATED, INSTALL PER SMACNA STANDARDS a) DUCT LINING SCHEDULE

1/2

3/4"

- (1) RECTANGULAR SUPPLY DUCT 1/2": THROUGHOUT THE FIRST 10 FEET OF DUCT. 1/2" : THROUGHOUT THE FIRST 10 FEET OF DUCT. (2) RETURN AIR DUCT
- D. DUCTWORK: THERMAL INSULATION
- 1) DUCT COVERING: 3/4 LB/CF, FIBERGLASS BLANKET WITH FACTORY APPLIED VAPOR BARRIER AND FACING, THICKNESS AS SCHEDULED, INSTALLATION IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
- a) DUCT COVERING SCHEDULE: MINIMUM R-6
- (1) ROUND SUPPLY DUCT (2) RECTANGULAR SUPPLY DUCT
- (3) OUTDOOR AIR / MAKE-UP AIR DUCT 2"
- A. ALL DUCTWORK, UNLESS OTHERWISE INDICATED, SHALL BE FABRICATED FROM GALVANIZED SHEET STEEL COMPLYING WITH ASTM A 527, LOCKFORMING QUALITY, WITH G 60 ZINC COATING IN ACCORDANCE WITH ASTM A 525; AND MILL PHOSPHATIZED FOR EXPOSED LOCATIONS.
- B. DUCTWORK, METAL GAUGES, REINFORCING, ETC. SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS," LATEST EDITION FOR A 2 INCH WATER GAUGE STATIC PRESSURE
- C. ALL FITTINGS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS," LATEST EDITION.
- D. SEAL ALL CONCEALED DUCTWORK JOINTS WITH NON-HARDENING, NON-MIGRATING MASTIC SEALANT, AS RECOMMENDED FOR SEALING SEAMS AND JOINTS IN DUCTWORK. OIL BASE CAULKING AND GLAZING COMPOUNDS SHALL NOT BE ACCEPTABLE. DUCTS SHALL BE SEALED TO THE CLASS LEVEL LISTED BELOW.

1) UNCONDITIONED SPACES	CLASS B	CLASS A	CLASS C	CLASS B
1) CONDITIONED SPACES (PLENUM)	CLASS C	CLASS B	CLASS B	CLASS C
	SUPPLY < 2" M.C.	SUPPLY > 2" W.C.	EXHAUST	RETURN

E. DUCT SIZES SHOWN ON THE DRAWINGS ARE SHEETMETAL SIZES, ALLOWANCE FOR DUCT LINER HAS BEEN MADE WHERE APPLICABLE

11. FLEXIBLE DUCT

- A. ATCO #086 (R-6), OR EQUAL.
- B. FACTORY APPLIED INSULATION AND VAPOR BARRIER, 1-1/2" THICK.
- C. MAXIMUM LENGTH OF 5'-O"
- 12 FLUES AND ACCESSORIES

A. FLUES SHALL BE DOUBLE WALL TYPE B EQUAL TO METALBESTOS. PROVIDE MANUFACTURER'S STANDARD FITTINGS AND ACCESSORIES (ROOF THIMBLE, STORM COLLAR, COUNTERFLASHING, ETC.) AS REQUIRED FOR A COMPLETE INSTALLATION.

13. EXHAUST FANS:

- A. CENTRIFUGAL CEILING EXHAUSTERS SHALL BE ELECTRICALLY POWERED CENTRIFUGAL TYPE FAN SUITABLE FOR MOUNTING IN THE CEILING WITH A PERFORATED OFF-WHITE METAL GRILLE WITH A THUMBSCREW ATTACHMENT FOR EASY ACCESS TO FAN HOUSING. UNIT SHALL CONSIST OF A GALVANIZED STEEL HOUSING LINED WITH ACOUSTICAL INSULATION AND SHALL INCLUDE AN INTEGRAL BACKDRAFT DAMPER ON FAN DISCHARGE. MOTOR SHALL BE A PERMANENT SPLIT-CAPACITOR TYPE MOTOR, PERMANENTLY LUBRICATED, WITH THERMAL OVERLOAD PROTECTION. PROVIDE DISCONNECT SWITCH OR OTHER MEANS OF DISCONNECT AT MOTOR IN FAN HOUSING.
- B. PROPELLER WALL EXHAUSTERS SHALL BE ELECTRICALLY POWERED PROPELLER TYPE FAN SUITABLE FOR MOUNTING IN THE WALL WITH A METAL GRILLE WITH A THUMBSCREW ATTACHMENT FOR EASY ACCESS TO FAN HOUSING. UNIT SHALL CONSIST OF A GALVANIZED STEEL HOUSING LINED WITH ACOUSTICAL INSULATION AND SHALL INCLUDE AN INTEGRAL BACKDRAFT DAMPER ON FAN DISCHARGE. MOTOR SHALL BE A PERMANENT SPLIT-CAPACITOR TYPE MOTOR, PERMANENTLY LUBRICATED, WITH THERMAL OVERLOAD PROTECTION. PROVIDE WALL SLEEVE, WEATHER HOOD, OSHA SCREEN, AND DISCONNECT SWITCH OR OTHER MEANS OF DISCONNECT AT MOTOR IN FAN HOUSING.
- 14. AIR HANDLING UNIT AND HEAT PUMP CONDENSING UNIT:
- A. AIR HANDLING UNIT SHALL BE FACTORY ASSEMBLED, PRE-WIRED UNIT CONSISTING OF SHEETMETAL CASING, FILTER, SUPPLY FAN, ELECTRIC RESISTANCE HEATER, AND CONTROLS. CAPACITY SHALL BE AS SCHEDULED.
- 1) THE UNIT SHALL BE EQUIPPED WITH THE MANUFACTURER'S STANDARD CONTROLS INCLUDING 24 VOLT CONTROL TRANSFORMER, HIGH TEMPERATURE LIMIT SWITCH, AND FAN TIMED DELAY
- 2) RETURN AIR INLET ON UNIT SHALL BE PROVIDED WITH A 1" THROWAWAY TYPE FILTER AND SLIDE IN FRAME, MOUNTED ON THE UNIT.
- 3) FAN SHALL BE A DIRECT DRIVE MULTI-SPEED BLOWER, RESILIENTLY MOUNTED IN THE CASING. MOTOR SHALL BE PROVIDED WITH AUTOMATIC THERMAL OVERLOAD PROTECTION.
- 4) REFRIGERANT COIL: ALUMINUM FINS BONDED TO SEAMLESS COPPER TUBE BY MEANS OF MECHANICAL EXPANSION. AN EQUALIZING TYPE VERTICAL DISTRIBUTOR SHALL ENSURE EACH COIL CIRCUIT RECEIVES THE SAME AMOUNT OF REFRIGERANT.
- 5) ELECTRIC HEAT: ELECTRIC HEATER SHALL BE INSTALLED INTERNAL TO THE AIR HANDLING UNIT. HEATING ELEMENTS SHALL BE CONSTRUCTED OF HEAVY DUTY NICKEL CHROMIUM. EACH HEATER SHALL HAVE AUTOMATICALLY RESET HIGH LIMIT CONTROL OPERATING THROUGH HEATING ELEMENT CONTACTORS. EACH HEATER SHALL BE INDIVIDUALLY FUSED AND SHALL COMPLY WITH ALL NEC REQUIREMENTS. HEATERS SHALL BE UL LISTED.
- B. HEAT PUMP CONDENSING UNIT SHALL BE FACTORY-ASSEMBLED AND TESTED AIR-COOLED CONDENSING UNIT, CONSISTING OF COMPRESSOR, CONDENSER COIL, FAN, MOTOR, REVERSING VALVE, SOLID-STATE DEFROST CONTROL UTILIZING THERMISTERS, REFRIGERANT RESERVOIR, OPERATING CONTROLS, ETC. CAPACITY AND ELECTRICAL CHARACTERISTICS SHALL BE AS SCHEDULED.
- 1) HERMETICALLY SEALED COMPRESSOR WITH BUILT-IN OVERLOADS AND VIBRATION ISOLATION. COMPRESSOR MOTOR, SHALL HAVE THERMAL AND CURRENT SENSITIVE OVERLOAD DEVICES, INTERNAL HIGH-PRESSURE PROTECTION, HIGH AND LOW PRESSURE CUTOUT SWITCHES, START CAPACITOR AND RELAY, 2-POLE CONTACTOR, CRANKCASE HEATER, AND TEMPERATURE ACTUATED SWITCH AND TIMER TO PREVENT COMPRESSOR RAPID CYCLE.
- 2) COIL SHALL BE COPPER TUBING WITH ALUMINUM FINS: COMPLETE WITH LIQUID ACCUMULATOR AND LIQUID SUBCOOLER. EXTEND REFRIGERANT PIPING WITH BRASS SERVICE VALVES, FITTINGS, AND GAGE PORTS TO EXTERIOR OF CASING.
- 3) ALUMINUM PROPELLER FAN SHALL BE DIRECT DRIVEN, WITH PERMANENTLY LUBRICATED FAN MOTOR HAVING THERMAL OVERLOAD PROTECTION.
- 4) PROVIDE REVERSING VALVE, SUCTION LINE ACCUMULATOR, DISCHARGE MUFFLER, FLOW CONTROL CHECK VALVE, AND SOLID-STATE DEFROST CONTROL UTILIZING THERMISTERS.

### MECHANICAL SPECIFICATIONS (CONTINUED)

### 15. UNIT HEATERS:

A. UNIT HEATERS SHALL BE FACTORY ASSEMBLED, PRE-WIRED UNITS CONSISTING OF CASING, SUPPLY FAN, GAS FIRED HEAT EXCHANGER, AND CONTROLS.

B. MOTOR SHALL BE TOTALLY ENCLOSED, WITH BUILT-IN, AUTOMATIC THERMAL OVERLOAD PROTECTION. PROPELLER SHALL BE EQUIPPED WITH SAFETY FAN GUARD.

C. THE HEAT EXCHANGER SHALL BE ALUMINIZED STEEL CONSTRUCTION.

D. THE UNITS SHALL BE EQUIPPED WITH THE MANUFACTURER'S STANDARD CONTROLS INCLUDING 24 VOLT CONTROL TRANSFORMER, AUTOMATIC SPARK IGNITION, AUTOMATIC GAS VALVE WITH GAS TRAIN, SAFETY PILOT WITH 100% SHUTOFF, AND FAN TIMED DELAY RELAY.

E. UNIT HEATERS SHALL BE AGA APPROVED.

### 16. CONTROL WIRING:

A. ELECTRICAL WIRING AND WIRING CONNECTIONS REQUIRED FOR THE INSTALLATION OF THE TEMPERATURE CONTROL SYSTEM, SHALL BE PROVIDED BY THIS CONTRACTOR, UNLESS SPECIFICALLY SHOWN ON THE ELECTRICAL DRAWINGS OR SPECIFICATIONS.

B. INSTALL CONTROL WIRING, WITHOUT SPLICES BETWEEN TERMINAL POINTS, COLOR CODED. INSTALL IN NEAT WORKMANLIKE MANNER, SECURELY FASTENED. INSTALL IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE AND THE ELECTRICAL SPECIFICATIONS.

1) INSTALL CIRCUITS OVER 25 VOLT WITH COLOR CODED NUMBER 12 WIRE.

2) INSTALL CIRCUITS UNDER 25 VOLT WITH COLOR CODED NUMBER 18 WIRE WITH 0.031 INCH HIGH TEMPERATURE 105 DEGREES F PLASTIC INSULATION ON EACH CONDUCTOR AND PLASTIC SHEATH OVER

3) INSTALL ELECTRONIC CIRCUITS WITH COLOR CODED NUMBER 22 WIRE WITH 0.023 INCH POLYETHYLENE INSULATION ON EACH CONDUCTOR WITH PLASTIC JACKETED COPPER SHIELD OVER

4) INSTALL LOW VOLTAGE CIRCUITS, LOCATED IN CONCRETE SLABS AND MASONRY WALLS, OR EXPOSED IN OCCUPIED AREAS, IN ELECTRIC CONDUIT.

5) ALL WIRING IN AREAS USED AS AIR PLENUMS SHALL BE IN ELECTRIC CONDUIT EXCEPT THAT LOW VOLTAGE WIRING MAY BE TEFLON COATED, ALUMINUM SHEATHED CABLE OR OTHER WIRE SPECIFICALLY APPROVED FOR INSTALLATION IN AIR PLENUMS, WHERE ACCEPTABLE BY LOCAL

6) ALL WIRING IN AREAS NOT USED FOR AIR MOVEMENT SHALL BE IN ELECTRIC METALLIC TUBING EXCEPT LOW VOLTAGE WIRING MAY BE IN APPROVED SIGNAL CABLE WHERE ACCEPTED BY LOCAL CODES.

C. THERMOSTATIC CONTROLS TO HAVE A 5°F DEADBAND AND SETPOINT OVERLAP RESTRICTIONS. 1) TEMPERATURE CONTROLS SETBACK TO BE 55°F (HEAT) AND 85° (COOL), 2-HOUR OCCUPANT OVERRIDE, 10-HOUR BACKUP.





Signature Builders KC, LLC 2751 NE Douglas St. - Suite R Lee's Summit, Missouri 64064 Phone: (816) 215-0891

> Website: www.sb-kc.net

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PLUMBING PLAN NOTES:	(CON

INFORMATION.

### PLUMBING GENERAL NOTES:

- 1. INSTALL ALL PIPE. ETC. AS HIGH AS POSSIBLE.
- 2. COORDINATE ALL WORK WITH OTHER TRADES AND EXISTING CONDITIONS AS REQUIRED TO PROPERLY INSTALL ALL SYSTEMS AS INTENDED, WITHIN THE CONFINES OF THE SPACES AVAILABLE, AND WITHOUT INTERFERENCES.
- 3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS OF FIXTURES.
- 4. REFER TO ARCHITECTURAL & STRUCTURAL DRAWINGS FOR REQUIREMENTS FOR SUPPORTING PIPING, EQUIPMENT, ETC. FROM THE STRUCTURE. PROVIDE ADDITIONAL STEEL AS REQUIRED TO PROPERLY SUPPORT SYSTEMS FROM THE STRUCTURE.
- 5. NO PIPING SHALL BE ROUTED OVER THE TOP OF ELECTRICAL PANELS.
- 6. CONTRACTOR TO TEST WATER PRESSURE ON SITE AND PROVIDE PRESSURE REDUCING VALVE ON WATER SERVICE IF PRESSURE IS OVER 80 PSI.

### PLUMBING SYMBOLS

— <b>— —</b>	SOIL AND WASTE PIPING BELOW FLOOR/GRADE	
	SOIL AND WASTE PIPING ABOVE FLOOR/GRADE	
V	SANITARY VENT PIPING ABOVE GRADE	
	SANITARY VENT PIPING BELOW GRADE	PROVIDE REDUCING
	DOMESTIC COLD WATER PIPING	SUPPLY P
	DOMESTIC HOT WATER PIPING	
	DOMESTIC HOT WATER RECIRCULATION PIPING	
—_G—_	PROPANE GAS PIPING	
D	EQUIPMENT DRAIN LINE	
с+	PIPING TURNING DOWN	MAIN FLC
+O	PIPING TURNING UP	CONNECT TO EXISTING
, <b>I</b> ,	TEE TOP CONNECTION	WATER WITH TEE
—  <b> </b> ——-	UNION	
	BACKFLOW PREVENTER	
FD⊘	FLOOR DRAIN	
FCO 0	FLOOR CLEAN OUT	
WC0 I	WALL CLEAN OUT	
600	GRADE CLEAN OUT	ROOF
—-+ <b>▼</b> +—-	VALVE	
	BALANCING VALVE	
<b>i∳i</b>	SOLENOID VALVE	
<b>iv</b> i	PRESSURE REGULATOR	CEILING
Ø	CHECK VALVE	
	CONNECT TO EXISTING	
I.E.	INVERT ELEVATION OF PIPE	
$\langle A \rangle$	MATCH MARKS ON PLUMBING RISER DIAGRAM	
		UPPER FLOOR

PLUMBING FIXTURE BRANCH PIPING SCHEDULE									
FIXTURE	WASTE	VENT	CM	ΗМ					
WATER CLOSET (TANK TYPE)	З"	2"	1/2"						
LAVATORY	1-1/4"	1-1/4"	1/2"	1/2"					
SINK	1-1/2"	1-1/2"	1/2"	1/2"					
FLOOR DRAIN	2"	2"							
MOP BASIN	2"	2"	1/2"	1/2"					
NOTE: INDIVIDUAL VENTS FOR FIXTURES ON PL	ANS AN	D RISER							

DIAGRAMS HAVE BEEN INCREASED WHERE HORIZONTAL VENT LENGTH IS IN EXCESS OF THE MAXIMUM DISTANCE INDICATED BY THE CODE.

CEILING

ROOF

CEILING

FD MAIN FLOOR

### PLUMBING FIXTURE SCHEDULE: (OR EQUAL)

	HANDICAP WA ELONGATED E SIPHON-JET A CHROME PLA
<u>L1</u>	HANDICAP LAY FRONT OVERF OFFSET GRID P-TRAP WITH O STOPS AND R PROWRAP SE
<u>51</u>	SINK:ELKAY, # COMPLIANT, S SATIN FINISH A SPOUT, 1.0 GF P-TRAP WITH ( IN-SINK-ERAT(
MB	MOP BASIN: FI VINYL BUMPER BREAKER, INT HOSE.
HB	HOSE BIBB: M OPERATED, IN
FD	FLOOR DRAIN 6" NIKALOY ST
ENH1	ELECTRIC TAN
ENH2	ELECTRIC TAN
MV	MIXING VALVE FREE BRONZE COPPER ENCA STAINLESSSTE (SET TO 110°F
<u>RPZ</u>	REDUCED ZON BRONZE BOD REPLACEABLE VALVE TEST C

FCO/WCO VINYL TILE FLOOR: JR SMITH #4140, OR EQUAL. QUARRY TILE FLOOR: JR SMITH #4200, OR EQUAL. CARPETED FLOOR: JR SMITH #4020-Y, OR EQUAL. UNFINISHED FLOOR: JR SMITH #4020, OR EQUAL. WALL: JR SMITH #4472, OR EQUAL, 24" ABOVE THE FLOOR.



### **CONDENSATE DRAIN DETAIL** SCALE: NONE





SCALE: NONE



# PEX PIPING REQUIREMENTS

PIPE SIZES GIVEN ON THE DRAWINGS ARE NOMINAL COPPER PIPE SIZE. IF PEX PIPING IS USED, INCREASE PEX PIPING ONE SIZE ABOVE LISTED SIZES AS REQUIRED TO EQUAL OR EXCEED COPPER PIPE INSIDE DIAMETER.



- 3" VTR



-3" VTR

**PLUMBING RISER DIAGRAMS** SCALE: NONE

TER CLOSET: AMERICAN STANDARD 1.6 GALLON FLUSH 16-1/2" HIGH BOWL, FLOOR MOUNTED, FLOOR OUTLET, TANK TYPE, VITREOUS CHINA, ACTION, OPEN FRONT SEAT WITH CHECK HINGE AND LESS COVER. TED ANGLE STOP AND RISER. HANDLE ON WIDE SIDE OF FIXTURE.

VATORY, WALL HUNG: AMERICAN STANDARD, 20"X 18", VITREOUS CHINA, FLOW, FAUCET WITH SINGLE METAL LEVER HANDLE, O.5 GPM AERATOR, ELBOW DRAIN AND 1-1/4" TAILPIECE, CHROME PLATED CAST BRASS CLEANOUT (MOUNTED PARALLEL WITH WALL), CHROME PLATED ANGLE RISERS, INSULATE EXPOSED DRAIN, WATER SUPPLIES, AND VALVES WITH EAMLESS MOLDED CLOSED CELL VINYL INSULATION.

#LRAD-2222, 19"x16"x 6-1/2" DEEP BOWL,21-3/8"x 21-3/8" CUT-OUT, ADA SINGLE COMPARTMENT, SELF-RIMMING STAINLESS STEEL SINK WITH AND SOUND DAMPENING UNDERCOATING, #LK-1000CR FAUCET, SWING PM AERATOR, SINGLE LEVER HANDLE, CHROME PLATED CAST BRASS CLEANOUT, CHROME PLATED ANGLE STOPS AND RISERS, OR #BADGER 5 DISPOSAL, 1/2 HP, 120 VOLT.

FIAT, #MSB-2424, MOLDED STONE MOP BASIN, 2" DRAIN, 24"X 24" BASIN, R GUARD, STERN WILLIAMS #T-10-VB FAUCET, SPRING CHECKS, VACUUM TEGRAL STOPS, WALL BRACE & PAIL HOOK, WALL BRACKET WITH 30"

NOODFORD, #24, 3/4" HOSE NOZZLE OUTLET, BRASS FINISH, HANDWHEEL NTEGRAL VACUUM BREAKER.

N: JR SMITH, #2005-A, CAST IRON FLOOR DRAIN WITH ADJUSTABLE TOP, TRAINER. PROVIDE WITH #2692 QUAD CLOSE TRAP SEAL DEVICE.

NKLESS HOT WATER HEATER: EEMAX #HAO18240, 240 VOLT, 18.0 KW.

NKLESS HOT WATER HEATER: EEMAX #HAO18240, 240 VOLT, 18.0 KM.

E: WATTS, #LFUSG-B, THERMOSTATIC CONTROLLED MIXING VALVE, LEAD BODY, LOCKED TEMPERATURE ADJUSTMENT CAP (VANDAL RESISTANT). APSULATED THERMOSTAT ASSEMBLY WITH BRASS SHUTTLE. EEL SPRINGS, INTEGRAL CHECK VALVES ON HOT AND COLD INLETS =). ASSE 1070 LISTED.

NE PRESSURE BACKFLOW PREVENTOR: WATTS #LFOO9, LEAD FREE DY CONSTRUCTION, TWO, IN-LINE INDEPENDENT CHECK VALVES, E CHECK SEATS WITH AN INTERMEDIATE RELIEF VALVE, AND BALL COCKS.

CLEANOUT WITH PIPE CAP (TYPICAL)

DRAIN LINE SLOPE AS REQUIRED TO DRAIN CONNECTION. TERMINATE AT P-TRAP WITH AIR GAP

## **GAS CONNECTION DETAIL**





5720 Reeder Shawnee, Ks. 66203 (913)262-1772





Signature Builders KC, LLC 2751 NE Douglas St. - Suite R Lee's Summit, Missouri 64064 Phone: (816) 215-0891

> Website: www.sb-kc.net

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Scale

3/16" = 1'-0"



	HEAT PUMP CONDENSING UNIT SCHEDULE											
			COOLING			ELECTRICAL				GEER		
MARK	MFGR	MODEL NO.	TOTAL BTUH	AMB.	EVAP. EAT DB/WB	VOLT/Ф/HZ	MIN. MCA (AMPS)	MIN. MOCP (AMPS)	MODEL NO.	JEEK	NOTES	
CU-1	LENNOX	ML-14XPI-042	42,000	95	80/67	240/1/60	24.2	40	AHU-1	14	1,2,3,4	
CU-2	LENNOX	ML-14XPI-042	42,000	95	80/67	240/1/60	24.2	40	AHU-2	14	1,2,3,4	

NOTES: 1. PROVIDE TIME DELAY ON COMPRESSOR RE-START, CRANKCASE HEATER, AND COMPRESSOR LOCK-OUT WITH AMBIENT BELOW 35 °F. PROVIDE INDOOR COIL WITH THERMAL EXPANSION VALVE (TXV).

2. MECHANICAL CONTRACTOR SHALL COORDINATE ALL UNIT MOCP'S OF ACTUAL INSTALLED EQUIPMENT WITH ELECTRICAL CONTRACTOR.

3. PROVIDE CONCRETE OR PRE-MANUFACTURED POLYOLEFIN PAD FOR EACH UNIT. SCREENING OF UNIT NOT ALLOWED PER FAA REQUIREMENTS.

4. PROVIDE HAIL GUARDS FOR EACH UNIT.

	AIR HANDLING UNIT SCHEDULE												
					COOLING			HEATING	(ELECTRIC)	ELECTRICAL			
MARK	MFGR	MODEL NO.	CFM	E.S.P.			EVAP. EAT	(RESI:	STANCE)			AIR (CFM)	
				IN. MG.	NG. TOTAL BTUH	AMB.	DB/WB	KM	STAGES	VOL1/Ø/HZ	ΗP		
AHU-1	LENNOX	CBA25UH-042	1,400	0.5	42,000	95	80/67	15	2	240/1/60	1	305	
AHU-2	LENNOX	CBA25UH-042	1,400	0.5	42,000	95	80/67	15	2	240/1/60	1	285	

NOTES: 1. PROVIDE 1" THICK THROWAWAY TYPE FILTER FOR EACH UNIT.

2. PROVIDE EACH UNIT WITH 7-DAY PROGRAMMABLE HEAT/COOL/AUTO CHANGEOVER THERMOSTAT.

3. CONDENSING UNITS, AND AIR HANDLING UNITS SHALL ALL BE OF THE SAME MANUFACTURER.

4. MECHANICAL CONTRACTOR SHALL COORDINATE ALL UNIT MOCP'S OF ACTUAL INSTALLED EQUIPMENT WITH ELECTRICAL CONTRACTOR.

5. EXTERNAL STATIC PRESSURE LISTED REPRESENTS STATIC PRESSURE REQUIRED FOR DUCTWORK AND DIFFUSERS OUTSIDE THE HVAC UNIT COMPLETELY INDEPENDENT OF ANY PRESSURE DROP THROUGH THE HVAC EQUIPMENT INCLUDING BUT NOT LIMITED TO FILTERS AND COILS.

6. PROVIDE GALVANIZED WATERTIGHT DRAIN PAN AND CONDENSATE FLOAT SWITCH TO DE-ENERGIZE THE AHU IF THE DRAIN PAN FILLS WITH WATER. 7. PROVIDE MANUFACTURER'S UNIT STAND FOR SIDE RETURN.

8. PROVIDE SINGLE-POINT POWER CONNECTION.

	GAS FIRED UNIT HEATER SCHEDULE											
				HEATING	G (GAS)	ELECTRICA	×L					
MARK	MFGR	MODEL	CFM	BTUH INPUT	BTUH OUTPUT	VOLT/Ø/HZ HP		REMARKS				
UH-1	LENNOX	LF-25-200A	2,650	200,000	166,000	120/10/60	1/3	1,2,3				
UH-2	LENNOX	LF-25-200A	2,650	200,000	166,000	120/10/60	1/3	1,2,3				

NOTES: 1. PROVIDE EACH UNIT ELECTRONIC DIRECT SPARK IGNITION & ALUMINIZED STEEL HEAT EXCHANGER. 2. PROVIDE EACH UNIT WITH UNIT MOUNTED THERMOSTAT & CONTROL VOLTAGE TRANSFORMER.

3 PROVIDE WITH PROPANE CONVERSION KIT.

			I	EXHAUS	t fai	N SCHEI	JULE			
				EXTERNAL		ELECTRIC	AL			
MARK	MFGR	MODEL	CFM	STATIC P. IN. MG.	RPM	VOLT/Ø/HZ	PWR	FAN TYPE	CONTROLS	
EF-1	соок	GC-128	75	0.1	750	120/1/60	29 M	CEILING EXH.	SMITCH	1
EF-2	соок	GC-128	75	<i>O</i> .1	750	120/1/60	29 M	CEILING EXH.	SMITCH	1
EF-3	соок	12A17D	730	0.1	1725	120/1/60	1/4 HP	WALL PROP	SWITCH	2
NOTE	ES: 1. PROVIDE AND WAL	E CEILING GRIL LL CAP.	LE, INTEGI	RAL BACK D	RAFT D	AMPER, VAR	RI-SPEED	CONTROLLER (NEAR	R FAN AND ABOV	E CEILING)

2. PROVIDE WALL SLEEVE, REAR GUARD HOUSING, BACKDRAFT DAMPER, WEATHER HOOD, BIRD SCREEN.

### MECHANICAL GENERAL NOTES:

- 1. COORDINATE ALL WORK WITH OTHER TRADES AND EXISTING CONDITIONS AS REQUIRED TO PROPERLY INSTALL ALL SYSTEMS AS INTENDED, WITHIN THE CONFINES OF THE SPACES AVAILABLE, AND WITHOUT INTERFERENCES.
- 2. THIS CONTRACTOR SHALL PERFORM ALL WORK INDICATED AND/OR AS REQUIRED FOR THE PROPER INSTALLATION AND OPERATION OF THE MECHANICAL SYSTEMS.
- 3. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF DIFFUSERS.
- 4. INSTALL ALL DUCT, PIPE, ETC. AS HIGH AS POSSIBLE.
- 5. DUCT SIZES SHOWN ARE ACTUAL SHEET METAL SIZES AND INCLUDE AN ALLOWANCE FOR DUCT LINER WHERE APPLICABLE.
- 6. PROVIDE FLEXIBLE CONNECTION BETWEEN DUCTWORK AND AIR HANDLING UNITS, EXHAUST FANS, AND OTHER MOTORIZED EQUIPMENT.
- 7. NO DUCT SHALL BE ROUTED OVER THE TOP OF ELECTRICAL PANELS.
- 8. ALL MECHANICAL SYSTEMS SHALL BE BALANCED BY A CERTIFIED BALANCING CONTRACTOR. REFER TO SPECIFICATIONS FOR DETAILS.

# NOTES 1,2,3,4,5,7,8 1,2,3,4,5,6,7,8

DIFFUSER SCHEDULE										
MARK	MF	GR	MODEL	NECK SIZE	FACE SIZE	FINISH		NOTES		
SR-1	TIT	US	300RS	12"x6"	-	NH	ITE	W/ 0.B.D.		
5R-2			300RS	8"×6"	-			W/ O.B.D.		
5R-3			300RS	16"×6"	-			W/ O.B.D.		
TG-1			350RL	14"x8"	-			-		
RG-1	1		PAR/3	22"×22"	24"×24"			W/ TRM		

NOTES

Area (sqft)	OCCUPANCY CLASSIFICATION	Occupant Density #/1000 sqft	People outdoor airflow rate in breathing zone, (Rp) cfm/person	Area outdoor airflow rate in breathing zone, (Ra) cfm/sqft
	Offices			
260	Conference rooms	50	5	0.06
610	Office spaces	5	Б	0.06
480	Break Room	25	Б	0.06
	Public spaces			
350	Corridors	0	0	0.06
60	Toilet rooms public	0	0	0
	Offices			
445	Conference rooms	50	5	0.06
650	Office spaces	5	5	0.06
			1	

UNIT

AHU-1

OUTDOOR AIR CALCULATIONS

AHU-2	60	Break Room	25	ທ	0.06	
		Public spaces				
	350	Corridors	0	0	0.06	
	60	Toilet rooms public	0	0	0	50/70
	•					
		Storage				
⊑г-3	9700	Warehouses	0	0	0.06	

MEC	HANICAL SYMBOLS
$\bowtie$	NEW SUPPLY DIFFUSER
$\square$	NEW RETURN AIR GRILLE
	EXHAUST GRILLE/FAN
Ō	THERMOSTAT, MOUNTED AT 48" AFF
<u></u> M	MOTORIZED DAMPER/LOUVER
<u>+</u> +	NEW DUCTWORK
32"x14"	SIZE OF RECTANGULAR DUCT
6"Ф	SIZE OF ROUND DUCT
	FLEXIBLE DUCTWORK
	FLEXIBLE CONNECTION TO FAN
3	FLOOR PLAN NOTE DESIGNATION
S.A.	SUPPLY AIR
R.A.	RETURN AIR
EXH.	EXHAUST AIR
	TRANSITION IN DUCT SIZE
Key	ELBOW WITH TURNING VANES
2	MANUAL VOLUME DAMPER
	MANUAL VOLUME DAMPER
	MOTORIZED CONTROL DAMPER
	SPLITTER DAMPER WITH HORIZONTAL REGULATOR
	SUPPLY AIR DUCT UP/DOWN

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RTU-1

RETURN AIR DUCT UP/DOWN EXHAUST AIR DUCT UP/DOWN CHANGE IN ELEVATION UP (UP) DOWN (DN) IN DIRECTION OF FLOW

SCHEDULED MECHANICAL EQUIPMENT

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t te	Breathing zone outdoor airflow (Vbz)	Zone air distribution effectivene ss (Ez)	Zone outdoor airflow (cfm)
	81	0.8	101
	52	0.8	65
	89	0.8	111
	21	0.8	26
	0	0.8	0
		Total	303
	138	0.8	172
	ເກ ເກ	0.8	69
	11	0.8	14
	21	0.8	26
	0	0.8	0
		Total	282
	582	0.8	728
		Total	728





5720 Reeder Shawnee, Ks. 66203 (913)262-1772



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mgspencer@sbcglobal.net

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