GENERAL NOTES

A. PROVIDE ALL HEATING, VENTILATING AND AIR CONDITIONING ITEMS INDICATED ON THE DRAWINGS, DESCRIBED IN THIS SPECIFICATION, OR REQUIRED FOR A COMPLETE AND PROPER INSTALLATION. HVAC WORK INCLUDES THE FOLLOWING:

1. HVAC UNITS AND ACCESSORIES;
2. EXHAUST FANS;
3. DUCTS, FILTERS, DAMPERS, GRILLES, REGISTERS, DIFFUSERS;
4. CONTROLS, INCLUDING 24 VOLT CONTROL WIRING AND 120/24 VOLT TRANSFORMERS;
5. CONDUIT FOR LOW VOLTAGE WIRING;
6. INSULATION FOR DUCTS AS REQUIRED IN THIS SECTION;
7. CONDENSATE PIPING AND APPURTENANCES;
8. FLASHING FOR HVAC SYSTEMS THAT PENETRATE WALLS AND ROOFS;

B. FURNISH, WITHOUT EXTRA CHARGE, ANY ADDITIONAL MATERIAL AND LABOR REQUIRED TO COMPLY WITH THE ABOVE CODES AND STANDARDS, EVEN THOUGH THE WORK MAY NOT BE DESCRIBED IN THE CONTRACT DOCUMENTS. WHERE THE REQUIREMENTS OF THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THE ABOVE CODES AND STANDARDS, THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE.

C. AFTER AWARD OF CONTRACT AND BEFORE COMMENCING WORK, IF REQUESTED BY CIRCLE K PROJECT ENGINEER, SUBMIT SIX COPIES OF THE FOLLOWING TO THE ARCHITECT FOR APPROVAL. SUBMITTALS SHALL BE IN BROCHURE FORM WITH INDEX AND SELECTED ITEMS CLEARLY DESIGNATED AND REFERENCED TO THE APPROPRIATE EQUIPMENT TAG NUMBER:

1. COMPLETE MATERIALS LIST OF ALL ITEMS PROPOSED TO BE FURNISHED AND INSTALLED UNDER THIS SECTION;
2. CATALOG CUTS AND OTHER DATA REQUIRED TO DEMONSTRATE COMPLIANCE WITH THE CONTRACT DOCUMENTS.

D. COOPERATE WITH OTHER TRADES IN ORDER THAT ALL SYSTEMS IN THE WORK MAY BE INSTALLED IN THE BEST ARRANGEMENT.

E. EXAMINE THE AREAS AND CONDITIONS UNDER WHICH WORK OF THIS SECTION WILL BE INSTALLED. CORRECT CONDITIONS DETRIMENTAL TO THE PROPER AND TIMELY COMPLETION OF THE WORK. NOTIFY ARCHITECT OF ANY DISCREPANCIES. DO NOT PROCEED UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

F. AVOID INTERFERENCE WITH STRUCTURE, AND WITH WORK OF OTHER TRADES. INSTALL ALL EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS. INSTALL ACCESSIBLE PARTS, INCLUDING EQUIPMENT, COILS, VALVES, DAMPERS, CONTROLS, AND FILTERS WITH ADEQUATE CLEARANCE FOR INSPECTION,ADJUSTMENTS, REPAIR, AND REPLACEMENT.

G. ALL OTHER MATERIALS, NOT SPECIFICALLY DESCRIBED BUT REQUIRED FOR A COMPLETE AND PROPER INSTALLATION, SHALL BE AS SELECTED BY THE CONTRACTOR SUBJECT TO ACCEPTANCE BY THE ENGINEER.

H. ALL PIPING AND DUCTS IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN FURRED CHASES OR SUSPENDED CEILINGS, UNLESS OTHERWISE NOTED.

I. PROVIDE ACCESS PANELS OR DOORS IN UNACCESSIBLE CEILINGS AND/OR CHASES FOR ALL VALVES, TRAPS, DAMPERS, CLEANOUTS, COILS, FANS, CONTROLS, ETC. ACCESS DOOR RATING SHALL MATCH CLASSIFICATION OF WALL AND CEILING FIRE RATING.

J. COORDINATE THE LOCATION OF ALL DIFFUSERS, GRILLES, REGISTERS, ACCESS DOORS, ETC., WITH THE ARCHITECTURAL REFLECTED CEILING PLAN(S).

K. ALL ROUND RUNOUTS AND DROPS TO DIFFUSERS SHALL BE THE SAME NOMINAL SIZE AS THE SCHEDULED DIFFUSER NECK SIZE.

L. THE FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED. ALL DUCT SIZES SHOWN ON DRAWINGS ARE NET INSIDE DIMENSIONS.

M. PROVIDE TURNING VANES IN ALL SQUARE ELBOWS. EXCEPT TRANSFER AIR SOUND ELBOWS.

N. THE CFM OF EACH DIFFUSER, REGISTER, ETC., IS INDICATED IN THE SYMBOL DESIGNATION ON THE DRAWINGS.

O. DO NOT CUT INTO OR REDUCE THE SIZE OF ANY STRUCTURAL MEMBER WITHOUT THE PERMISSION OF THE ARCHITECT.

P. CONTRACTOR SHALL COORDINATE ALL DUCTWORK, PIPING, PLUMBING AND FIRE PROTECTION PIPING WITH STRUCTURAL AND ELECTRICAL SYSTEMS AND SHALL PROVIDE NECESSARY OFFSETS TO AVOID CONFLICTS AND TO MAINTAIN EQUIPMENT ACCESS AND SERVICEABILITY.

Q. CONTRACTOR SHALL FURNISH ALL NECESSARY STRUCTURES, INSERTS, SLEEVES, AND HANGING DEVICES FOR INSTALLATION OF MECHANICAL AND PLUMBING EQUIPMENT, DUCTWORK AND PIPING, ETC. CONTRACTOR SHALL COORDINATE WITH GENERAL CONTRACTOR AND ALL BUILDING TRADES TO AVOID CONFLICTS AND TO MAINTAIN EQUIPMENT ACCESS AND SERVICEABILITY.

R. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY MISCELLANEOUS ANGLES, CHANNELS, UNISTRUT, ETC., AS MAY BE REQUIRED TO ADEQUATELY SUPPORT THE MECHANICAL PIPING, DUCTWORK, AND EQUIPMENT IN A MANNER APPROVED BY THE ARCHITECT WHICH WILL NOT OVERLOAD THE BUILDING STRUCTURAL SYSTEM.

S. CONTRACTOR SHALL PROVIDE RETURN AIR OR TRANSFER AIR OPENINGS IN FULL HEIGHT WALLS SIZED AT 500 FPM (UNLESS OTHERWISE SPECIFICALLY SHOWN ON THE DRAWINGS) TO CREATE AND/OR MAINTAIN A RETURN AIR PATH AS REQUIRED. FIRE DAMPERS AND/OR SMOKE DAMPERS SHALL BE PROVIDED IN SUCH OPENINGS WHERE REQUIRED BY NOTE "H".

T. SEAL ALL TRANSVERSE JOINTS, LONGITUDINAL SEAMS, DUCT WALL PENETRATIONS AND FITTING CONNECTIONS ON ALL DUCT SYSTEMS..

U. NOTIFY CIRCLE K PROJECT ENGINEER AT LEAST 24 HOURS PRIOR TO COVERING OR ENCLOSING WORK. DO NOT ALLOW OR CAUSE ANY OF THE WORK OF THIS SECTION TO BE COVERED UP OR ENCLOSED UNTIL IT HAS BEEN OBSERVED AND ACCEPTED BY THE CIRCLE K PROJECT ENGINEER AND BY ALL OTHER AUTHORITIES HAVING JURISDICTION.

V. THE ENTIRE SYSTEM SHALL BE WARRANTED FOR A PERIOD OF ONE (1) YEAR BEGINNING WITH OWNER'S ACCEPTANCE OF THE WORK. ALL LABOR AND MATERIALS NECESSARY TO REPAIR OR REPLACE THE SYSTEM, OR PORTIONS THEREOF, DURING THAT TIME SHALL BE WARRANTED FOR A PERIOD OF ONE (1) YEAR FROM THE REPAIR OR REPLACEMENT.

W. INSTRUCT OWNER'S REPRESENTATIVE IN THE OPERATION OF THE SYSTEMS.

X. PROVIDE ONE REPRODUCIBLE AS-BUILT DRAWING AND AN OPERATION AND MAINTENANCE MANUAL. AS A MINIMUM, THE MANUAL SHALL CONTAIN:

1. A COMPLETE LIST OF ALL EQUIPMENT AND APPURTENANCES WITH EQUIPMENT DESIGNATIONS (PER DRAWINGS), MANUFACTURERS, AND CATALOG NUMBERS.
2. COPIES OF MANUFACTURERS' BROCHURES AND INSTRUCTIONS FOR OPERATION AND MAINTENANCE OF ALL MECHANICAL EQUIPMENT, INCLUDING REPLACEMENT PARTS LISTS.
3. TYPED SYSTEM OPERATION AND MAINTENANCE INSTRUCTIONS, INCLUDING INSPECTION, LUBRICATION, AND SERVICE INSTRUCTIONS AND SCHEDULES.
4. LIST OF NAMES, ADDRESSES AND PHONE NUMBERS OF DISTRIBUTORS OF ALL EQUIPMENT AND APPURTENANCES.
5. MANUFACTURERS' WARRANTIES.

GAS PIPING NOTES

1. GAS PIPING SHALL BE SCHEDULE 40 GALVANIZED STEEL FOR PIPE SET OUTSIDE SPACE OR ON ROOF WITH MALLEABLE IRON SCREWED FITTINGS FOR ALL GAS PIPING 1-1/2" AND SMALLER. GAS LINES 2" AND LARGER AND ALL BURIED PIPING USE WELDED FITTINGS. USE FLANGES ON PIPING 2" AND LARGER AND UNIONS ON PIPING 1-1/2" OR SMALLER.
2. GAS PIPING SHALL BE SCHEDULE 40 BLACK STEEL FOR PIPE SET INSIDE THE SPACE OR IN CEILING SPACE WITH MALLEABLE IRON SCREWED FITTINGS FOR ALL GAS PIPING 1-1/2" AND SMALLER. GAS LINES 2" AND LARGER AND ALL BURIED PIPING USE WELDED FITTINGS. USE FLANGES ON PIPING 2" AND LARGER AND UNIONS ON PIPING 1-1/2" OR SMALLER.
3. GAS PIPING BELOW GRADE SHALL BE POLYETHYLENE BURIED 18" BELOW GRADE WITH 18 GAUGE COPPER TRACER WIRE, RISE TO 9" ABOVE GRADE SHALL BE MADE WITH AN APPROVED ANODELESS STEEL RISER AND TERMINATED AT EACH END OF PIPE.
4. ALL GAS PIPING UNDER ASPHALT OR CONCRETE PAVING ADJOINING BUILDINGS MUST BE SLEEVE IN A GAS-TIGHT VENTED PIPE.
5. GAS PIPING SHALL BE SUPPORTED AS FOLLOWS:
   A. 1/2" PIPE : SUPPORT @ 6 FEET INTERVALS.
   B. 3/4" OR 1" PIPE : SUPPORT @ 8 FEET INTERVALS.
   C. 1-1/4" PIPE : SUPPORT @ 10 FEET INTERVALS.

CODE INFORMATION

A. 2009 IBC, 2009 IMC, 2008 NEC AND 2009 IPC.

ALL SYSTEMS SHALL BE IN COMPLIANCE WITH THE ABOVE CODES AS ADOPTED BY THE CITY OF COLORADO SPRINGS AND 2011 PIKES PEAK REGIONAL BUILDING CODE.

B. OUTDOOR AIR VENTILATION PROVIDED AND BASED ON CHAPTER 4 OF 2009 IMC.

1. SEE SHEET M3.0 FOR VENTILATION CALCULATIONS.

C. ALL ROOFTOP EQUIPMENT SHALL BE PERMANENTLY IDENTIFIED AS TO THE AREA SERVED WITH A RUST-PROOF METAL NAMEPLATE PER 2009 IMC.

D. DUCT SMOKE DETECTORS REQUIRED PER SECTION 609 2009 IMC SHALL BE INSTALLED IN THE RETURN DUCTWORK AS SHOWN ON THE PLANS. IF A FIRE ALARM SYSTEM IS AVAILABLE, THAT THE DUCT SMOKE DETECTOR(S) SHALL BE CONNECTED TO THE FIRE ALARM SYSTEM AND IF A FIRE ALARM SYSTEM IS NOT AVAILABLE, PROVIDE A VISIBLE AND AUDIBLE SUPERVISORY SIGNAL AT A CONSTANTLY SUPERVISED LOCATION TRIGGERED BY THE ACTIVATION OF A DUCT SMOKE DETECTOR. INCLUDE THE AIR DUCT DETECTOR TROUBLE INDICATOR (LED AT THE CEILING BELOW THE DUCT DETECTOR).

E. EQUIPMENT AND APPLIANCES SHALL BE INSTALLED AS REQUIRED BY THE TERMS OF THEIR APPROVAL, IN ACCORDANCE WITH THE CONDITIONS OF THE LISTING, THE MANUFACTURERS INSTALLATION INSTRUCTIONS AND THIS CODE. MANUFACTURERS INSTALLATION INSTRUCTIONS SHALL BE AVAILABLE ON THE JOB SITE AT THE TIME OF INSPECTION PER 2009 IMC SECTION 304.1.

F. ACCESS TO ROOF MOUNTED EQUIPMENT COMPLIES WITH 2009 IMC . SEE ARCHITECTURAL DRAWINGS FOR ROOF ACCESS DETAILS.

MATERIALS SPECIFICATIONS

1. ALL DUCTWORK SHALL BE CONSTRUCTED FROM NEW HOT DIPPED GALVANIZED SHEET IRON OR STEEL, ASTM A-120, IN ACCORDANCE WITH THE IMC, ASHRAE GUIDE, AND SMACNA STANDARDS FOR GAGE AND REINFORCEMENT. ALL LOW VELOCITY AIR CONDITIONING SUPPLY AIR AND RETURN AIR DUCTWORK SHALL BE 2-INCH DUCT CONSTRUCTION. CONSTRUCT AND ERECT DUCTWORK IN ACCORDANCE WITH THE CURRENT ISSUES OF THE IMC, SMACNA STANDARDS AND ASHRAE HANDBOOKS. DUCTS SHALL CONFORM TO DIMENSIONS ON THE DRAWINGS UNLESS LOCATION OF STRUCTURAL MEMBERS PROHIBITS. IN CASE OF CHANGE IN DIMENSIONS, CROSS SECTIONAL AREAS SHALL BE MAINTAINED.
2. INSULATE THE FIRST 10 FEET OF ALL RECTANGULAR SUPPLY AIR AND ALL RECTANGULAR RETURN AIR SHEET METAL DUCTWORK INTERNALLY WITH JOHNS-MANVILLE LINACOUSTIC RC FIBERGLASS DUCT LINER WITH REINFORCED COATING SYSTEM, THICKNESS 1" (R=6.0) AND DENSITY 1-1/2 PCF. ALL OTHER RECTANGULAR SUPPLY AIR AND RIGID ROUND DUCTWORK SHALL BE INSULATED WITH 2" THICK (R=6.0) JOHNS-MANVILLE MICROLITE DUCT WRAP WITH FSK VAPOR BARRIER.
3. CONDENSATE DRAIN PIPING SHALL BE ASTM B-88, TYPE "M" HARD DRAWN COPPER WITH WROT COPPER FITTINGS AND SOLDERED JOINTS, 50/50 SOLDER. INSULATE WITH 1/2" THICK FLEXIBLE CLOSED CELL FOAMED PLASTIC PIPE INSULATION, ARMSTRONG ARAMFLEX, OR EQUAL FOR ENTIRE LENGTH. FITTINGS FIELD FABRICATED OF NESTING SIZES, SECURED WITH ADHESIVE. REFRIGERANT SUCTION LINES SHALL BE INSULATED TO 1" THICKNESS.
4. FLEXIBLE DUCTS SHALL BE THERMAFLEX II TYPE M-KE, FACTORY FABRICATED ASSEMBLY, SPIRAL CONSTRUCTION, FIBERGLASS BLANKET INSULATION (R=6.0), AND MYLAR SHEATH. FLEXIBLE DUCTS UL LISTED FOR CLASS 0 DUCT AND COMPLY WITH NFPA-90A.
5. PROVIDE APPROVED FIRE AND SMOKE RATED FLEXIBLE CONNECTIONS BETWEEN FANS AND DUCTS.
6. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS' INSTRUCTIONS AND RECOMMENDATIONS.
7. MAKE ALL DUCT ELBOWS RIGHT ANGLE TYPE WITH DOUBLE-THICKNESS TURNING VANES OR CONSTRUCT WITH A CENTERLINE RADIUS 1-1/2 TIMES THE DUCT WIDTH.
8. PROVIDE WEATHER-PROOF FLASHINGS AT ALL DUCT AND PIPE PENETRATIONS THROUGH THE BUILDING WALLS AND ROOF. AS A MINIMUM, FLASHINGS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH SMACNA STANDARDS. FLASHINGS SHALL BE GUARANTEED WEATHERPROOF FOR THE DURATION OF THE GUARANTEE.
9. SUPPORT ALL HVAC UNITS, DUCTWORK, PIPING AND OTHER APPURTENANCES. DO NOT SCREW OR DRIVE FASTENERS INTO NON-STRUCTURAL COMPONENTS SUCH AS ROOF DECKS OR WALLS.
10. THOROUGHLY CLEAN ALL COMPONENTS AND REMOVE ALL DIRT, SCALE, OIL, AND OTHER FOREIGN SUBSTANCES. PROVIDE CLEAN AIR FILTERS FOR ALL EQUIPMENT.
11. FURNISH ACCESS DOORS AND PANELS AT WALLS, CEILINGS AND DUCTWORK FOR ACCESS TO HARDWARE, CONTROLS, OPERATOR, DRIVE MECHANISMS AND VOLUME DAMPERS.

SYMBOLS LIST NOTES

1. SYMBOLS LISTS, NOTES, ABBREVIATIONS, ETC. ARE FOR GENERAL REFERENCE ONLY. THE PRESENCE OF SYMBOLS, NOTES, ABBREVIATIONS, ETC. DOES NOT IMPLY ITS USE ON THIS PROJECT. REFER TO DRAWINGS FOR SPECIFIC SYMBOLS, NOTES, ABBREVIATIONS, ETC. USED.

DUCT SMOKE DETECTOR TESTING

TESTING AND INSPECTION OF SMOKE CONTROL DEVICES

A. PRIOR TO TESTING SMOKE CONTROL DEVICES:

1. VERIFY PROPER OPERATION OF EACH EXISTING SMOKE DETECTOR. ACTIVATION TESTING SHALL BE PERFORMED USING "CANNED SMOKE" ACCEPTABLE TO THE AUTHORITIES HAVING JURISDICTION.
2. VERIFY ACTIVATION OF THE EXISTING SMOKE DETECTOR SHUTS DOWN THE APPROPRIATE AIR-MOVING SYSTEM(S). VERIFY ACTIVATION OF THE SMOKE DETECTOR IS SHOWN BY THE FIRE ALARM SYSTEM WHERE MONITORING IS REQUIRED.

B. INSPECTION & TESTING OF SMOKE CONTROL DEVICES:

1. TESTING OF FIRE/SMOKE DAMPERS AND SMOKE DETECTORS SHALL BE ACCOMPANIED BY THE ELECTRICIAN AND/OR THE CONTROLS SYSTEM SUPPLIER. IF THE BUILDING HAS A FIRE ALARM SYSTEM, A REPRESENTATIVE OF THE MANUFACTURER MUST BE PRESENT DURING THE TESTING.

INSTALLATION NOTES

ALL AC UNITS TO BE MOUNTED ON FACTORY TYPE CURB, LEVEL PLATFORM UNITS AND MOUNTING SYSTEM TO BE SECURED SUBSTANTIALLY TO SUSTAIN VERTICAL AND HORIZONTAL LOADS.

PROVIDE FRESH AIR INTAKE (O.S.A. INTAKE) OF 15% UNLESS OTHERWISE NOTED ON PLANS OR EQUIPMENT SCHEDULE. INTAKE TO HAVE BUG SCREEN AND BACKDRAFT DAMPER.

ALL FRESH AIR INTAKES TO BE MINIMUM OF 10'-0" AWAY OR 3'-0" BELOW ALL EXHAUST OR PLUMBING VENTS.

ALL EXHAUST FANS BEING RUN THRU ROOF PROVIDE COVERED FLASHING WITH SCREEN SEALED WATERTIGHT AT ROOF PENETRATION.

ALL EXHAUST FANS, SUPPLY FANS AND FRESH AIR INTAKES SHALL HAVE AUTOMATIC OR GRAVITY DAMPERS THAT ARE CLOSED ON FAN SHUT DOWN.

ALL CONDENSATE DRAINS ABOVE ROOF TO BE 1" CU WITH "P" - TRAP AND VENT, HAVE 2 % MINIMUM SLOPE, AND DRAIN TO APPROVED RECEPTACLE, DRAIN OR LAVATORY TAIL PIECE. ALL CONDENSATES TO BE RUN TO MEET THE 2009 IBC, 2009 IMC, 2008 NEC AND 2009 IPC.

VERIFY PLACEMENT OF EQUIPMENT ON JOB SITE. COORDINATE PLACEMENT WITH GENERAL CONTRACTOR.

ALL AC UNITS WILL BE PERMANENTLY IDENTIFIED AS TO THE AREA THEY SERVE.

ALL MECHANICAL EQUIPMENT, DUCTWORK AND REGISTERS SHALL BE ANCHORED TO RESIST SEISMIC FORCES. THE SEISMIC BRACING / ANCHORAGE OF DUCTWORK AND EQUIPMENT SHALL BE IN ACCORDANCE WITH, "GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL AND PLUMBING SYSTEMS", PUBLISHED BY S.M.A.C.N.A. AND P.P.I.C., APPROVED BY O.S.A., AND ALL LOCAL AND I.B.C. CODES AND STANDARDS.

VENTILATION VERIFICATION

AN AIR BALANCE REPORT SHOWING FRESH AIR COMPLIANCE IS REQUIRED BY THE MECHANICAL INSPECTOR FOR FINAL INSPECTION APPROVAL. VENTILATION SYSTEMS SHALL BE BALANCED BY AN APPROVED METHOD. A BALANCE REPORT SHALL VERIFY THAT THE VENTILATION SYSTEM IS CAPABLE OF SUPPLYING AIRFLOW RATES REQUIRED BY CHAPTER 4 OF THE TO 2009 IMC.

2009 IECC COMPLIANCE NOTES

A. DESIGN HEATING AND COOLING LOADS FOR THE BUILDING HAVE BEEN CALCULATED USING CARRIER HAP USING PROCEDURES RECOMMENDED BY ASHRAE.

B. ALL EQUIPMENT AND SYSTEMS HAVE BEEN SIZED TO BE NO GREATER THAN NEEDED TO MEET CALCULATED LOADS.

C. HUMIDIFICATION SYSTEMS HAVE NOT BEEN PROVIDED ON THIS PROJECT.

D. EACH HEATING OR COOLING SYSTEM ZONE HAS BEEN PROVIDED WITH ITS OWN TEMPERATURE CONTROL DEVICE.

E. THE PROGRAMMABLE THERMOSTATS SHALL BE CAPABLE OF SETTING BACK TEMPERATURE TO 55 DEGREES F DURING HEATING AND SETTING UP TO 85 DEGREES F DURING COOLING, CAPABLE OF AUTOMATICALLY SETTING BACK OR SHUTTING DOWN SYSTEMS DURING UNOCCUPIED HOURS USING 7-DIFFERENT DAY SCHEDULES, HAVE A ACCESSIBLE MANUAL 2-HOUR OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS, HAVE A BATTERY BACK-UP CAPABLE OF MAINTAINING PROGRAMMED SETTINGS FOR AT LEAST 10 HOURS WITHOUT POWER. A SETBACK OR SHUTOFF CONTROL IS NOT REQUIRED ON THERMOSTATS THAT CONTROL SYSTEMS SERVING AREAS THAT OPERATE CONTINUOUSLY SUCH AS THE ELEVATOR EQUIPMENT ROOM AND ELECTRICAL ROOMS IF APPLICABLE.

F. OUTDOOR-AIR SUPPLY SYSTEMS WITH DESIGN AIRFLOW RATES GREATER THAN 3000 CFM AND ALL EXHAUST SYSTEMS MUST HAVE DAMPERS THAT ARE AUTOMATICALLY CLOSED WHILE EQUIPMENT IS NOT OPERATING IF APPLICABLE.

G. OUTSIDE VENTILATION HAS BEEN DESIGNED PER CHAPTER 4 OF THE 2009 IMC.

H. ALL SUPPLY AND RETURN AIR DUCTS MUST BE INSULATED WITH A MINIMUM OF R-6 (2" MINIMUM THICKNESS DUCT WRAP OR 1-1/2" WHEN DUCT IS LINED) PER SECTION 503.2.7 OF 2009 IECC. ALL DUCTS LOCATED OUTSIDE THE BUILDING MUST BE INSULATED WITH A MINIMUM OF R-8.

I. ALL JOINTS, LONGITUDINAL AND TRANSVERSE SEAMS, AND CONNECTIONS IN DUCTWORK MUST BE SECURELY SEALED USING WELDMENTS, MECHANICAL FASTENERS WITH SEALS, GASKETS, OR MASTICS, MESH AND MASTIC SEALING SYSTEMS, OR TAPES. TAPES AND MASTICS MUST BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A OR UL 181B.

J. MECHANICAL FASTENERS AND SEALS, MASTICS, OR GASKETS MUST BE USED WHEN CONNECTING DUCTS TO FANS AND OTHER AIR DISTRIBUTION EQUIPMENT, INCLUDING MULTIPLE-ZONE TERMINAL UNITS.

K. OPERATOR AND MAINTENANCE DOCUMENTATION MUST BE PROVIDED TO THE OWNER THAT INCLUDES EQUIPMENT INPUT AND OUTPUT CAPACITY AND REQUIRED MAINTENANCE ACTIONS, EQUIPMENT OPERATION AND MAINTENANCE MANUALS, HVAC SYSTEM CONTROL MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCE DESCRIPTIONS. DESIRED OR FIELD DETERMINED SET POINTS MUST BE PERMANENTLY RECORDED ON THE CONTROL DRAWINGS, AT CONTROL DEVICES, OR, FOR DIGITAL CONTROL SYSTEMS, IN PROGRAMMING COMMENTS. A COMPLETE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE.

L. EACH SUPPLY AIR OUTLET OR DIFFUSER MUST HAVE ITS OWN BALANCING DEVICE. ACCEPTABLE BALANCING DEVICES INCLUDE ADJUSTABLE DAMPERS LOCATED WITHIN THE DUCTWORK AND SUPPLY AIR DIFFUSERS.

WATER-HEATING EQUIPMENT AND HOT WATER STORAGE TANKS SHALL MEET THE REQUIREMENTS OF TABLE 504.2 OF 2009 IECC. THE EFFICIENCY SHALL BE VERIFIED THROUGH DATA FURNISHED BY THE MANUFACTURER OR THROUGH CERTIFICATION UNDER AN APPROVED CERTIFICATION PROGRAM.

M. FOR AUTOMATIC-CIRCULATING HOT WATER SYSTEMS, PIPING SHALL BE INSULATED WITH 1" OF INSULATION HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 BTU-IN/(H xFT^2x°F). THE FIRST 8'-0" OF PIPING IN NON-CIRCULATING WATER HEATING SYSTEMS SERVED BY EQUIPMENT WITHOUT INTEGRAL HEAT TRAPS SHALL BE INSULATED WITH 1/2" PIPE INSULATION OF MATERIAL HAVING CONDUCTIVITY NOT EXCEEDING 0.27 BTU-IN/(H xFT^2x°F).

ABBREVIATIONS

ABBREVIATION	DESCRIPTION
AC	AIR CONDITIONING UNIT
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AL	ACOUSTICAL LINING
AMP	AMPERE (AMPS)
AP	ACCESS PANEL
BF	BELOW FLOOR
BHP	BRAKE HORSE POWER
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
BD	BACKDRAFT DAMPER
C	CELSIUS
CI	CAST IRON
CFM	CUBIC FEET PER MINUTE
CO	CLEANOUT
CONT.	CONTINUATION
D	DRAIN
Db	DECIBEL
DB	DRY BULB
DBT	DRY BULB TEMPERATURE
DIA.	DIAMETER
DX	DIRECT EXPANSION
EFF	EFFICIENCY
ENT	ENTERING
EXH	EXHAUST
EMCS	ENERGY MANAGEMENT CONTROL SYSTEM
°F	DEGREES FAHRENHEIT
FB	FLAT BOTTOM
FCO	FLOOR CLEANOUT
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FD	FIRE DAMPER
F.G.	FILTER GAUGE
FLEX	FLEXIBLE
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FS	FLOOR SINK
FT	FLAT TOP
FT.	FEET
FSD	FIRE/SMOKE DAMPER
GA	GAUGE
GAL	GALLONS
GPM	GALLONS PER MINUTE
GPH	GALLONS PER HOUR
HB	HOSE BIBB
HD	HAND DAMPER (VOLUME DAMPER)
HORZ	HORIZONTAL
HP	HORSEPOWER
HR	HOUR(S)
IN	INCHES
KVA	KILOVOLT-AMPERE
KW	KILOWATT
KWH	KILOWATT HOUR
LBS	POUNDS
MAX	MAXIMUM
MA	MAIN AIR (CONTROLS)
MCC	MOTOR CONTROL CENTER
MIN	MINIMUM
N/A	NOT APPLICABLE
NC.	NOISE CRITERIA
NIC	NOT IN CONTRACT
#,NO.	NUMBER (QUANTITY)
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PD	PRESSURE DROP
QTY	QUANTITY
QUAD	QUADRANT
RA	RETURN AIR
REQ	REQUIRED
RH	RELATIVE HUMIDITY
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SCD	SMOKE CONTROL DAMPER
S.DPR.	SMOKE DAMPER
SP	STATIC PRESSURE (INCHES OF WATER)
SPEC	SPECIFICATION
SQ	SQUARE
SDVV	SINGLE DUCT VARIABLE VOLUME
ST	SOUND TRAP
TEMP	TEMPERATURE
TSTAT	THERMOSTAT
TP	TOTAL PRESSURE (INCHES OF WATER)
TYP	TYPICAL
UC	UNDERCUT
V	VOLTS
VAC	VOLTS, ALTERNATING CURRENT
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VERT	VERTICAL
VTR	VENT THRU ROOF
WB	WET BULB
WCO	WALL CLEANOUT
WH	WALL HYDRANT
Z	ZONE

ANNOTATION SYMBOLS

SYMBOL	DESCRIPTION
X	KEYED NOTE
XXX	ROOM NUMBER
* / * / *	SYMBOL INDICATES NEW EQUIPMENT NUMBER REFERS TO SPECIFIC EQUIPMENT OUTSIDE AIR CFM REQUIRED
XX / XX	HEX SYMBOL INDICATES NEW EQUIPMENT NUMBER REFERS TO SPECIFIC EQUIPMENT IDENTIFIED IN EQUIPMENT SCHEDULE
X	REVISION TRIANGLE REVISION NUMBER
XXX / XXX	DETAIL NUMBER DETAIL SYMBOL DRAWING WHERE DETAIL APPEARS
X	SECTION LETTER SECTION CUT SYMBOL
X / XXX	SECTION LETTER SECTION CUT SYMBOL DRAWING WHERE SECTION APPEARS
	NORTH ARROW

DUCTWORK SYMBOLS

SYMBOL	DESCRIPTION
12x8	RECTANGULAR DUCT, WIDTH x DEPTH (INCHES)
12ø	ROUND DUCT (INCHES)
	FLEXIBLE DUCT
	CONCENTRIC DUCT REDUCER
	SUPPLY DUCT - SECTION/ END VIEW
	RETURN DUCT - SECTION/ END VIEW
	EXHAUST DUCT - SECTION/ END VIEW
	CROSS SECTION THROUGH ROUND DUCT EXHAUST AIR DUCT
	RADIUS ELBOW 90°
	RETURN AIR CEILING GRILLE
	CEILING DIFFUSERS
	EXHAUST CEILING REGISTER OR GRILLE
T	ROOM THERMOSTAT
S	ROOM TEMPERATURE SENSOR
	DUCT SMOKE DETECTOR (DSD)
	MANUAL VOLUME DAMPER (VD)
	CEILING MOUNTED EXHAUST FAN
	ROOF MOUNTED EXHAUST FAN
	CONTINUATION OF DUCT OR PIPE

DIFFUSER,REGISTER + GRILLE SYMBOLS

SYMBOL	DESCRIPTION
X XX / XXX	SYMBOL (AS SHOWN ON SCHEDULE) NECK SIZE (DIA.) CFM

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ISSUE/REVISION RECORD

DATE	DESCRIPTION
01/19/15	PERMIT SET

PROFESSIONAL SEAL

COLORADO LICENSED ERIC MICHAEL WOLF PE 0048635 PROFESSIONAL ENGINEER

Signed: 01/19/15

PROFESSIONAL IN CHARGE
ERIC WOLF

PROJECT MANAGER
ALEX ADAIR

QUALITY CONTROL
DARCY HASBERRY

DRAWN BY
ALEX ADAIR

PROJECT NAME

CIRCLE K STORES, INC.

COLORADO SPRINGS COLORADO

E. FOUNTAIN BLVD & ACADEMY PARK LOOP

CIRCLE K STORES INC.

PROJECT NUMBER
20130780

SHEET TITLE
NOTES AND LEGEND - MECHANICAL

SHEET NUMBER
M1.0-CS