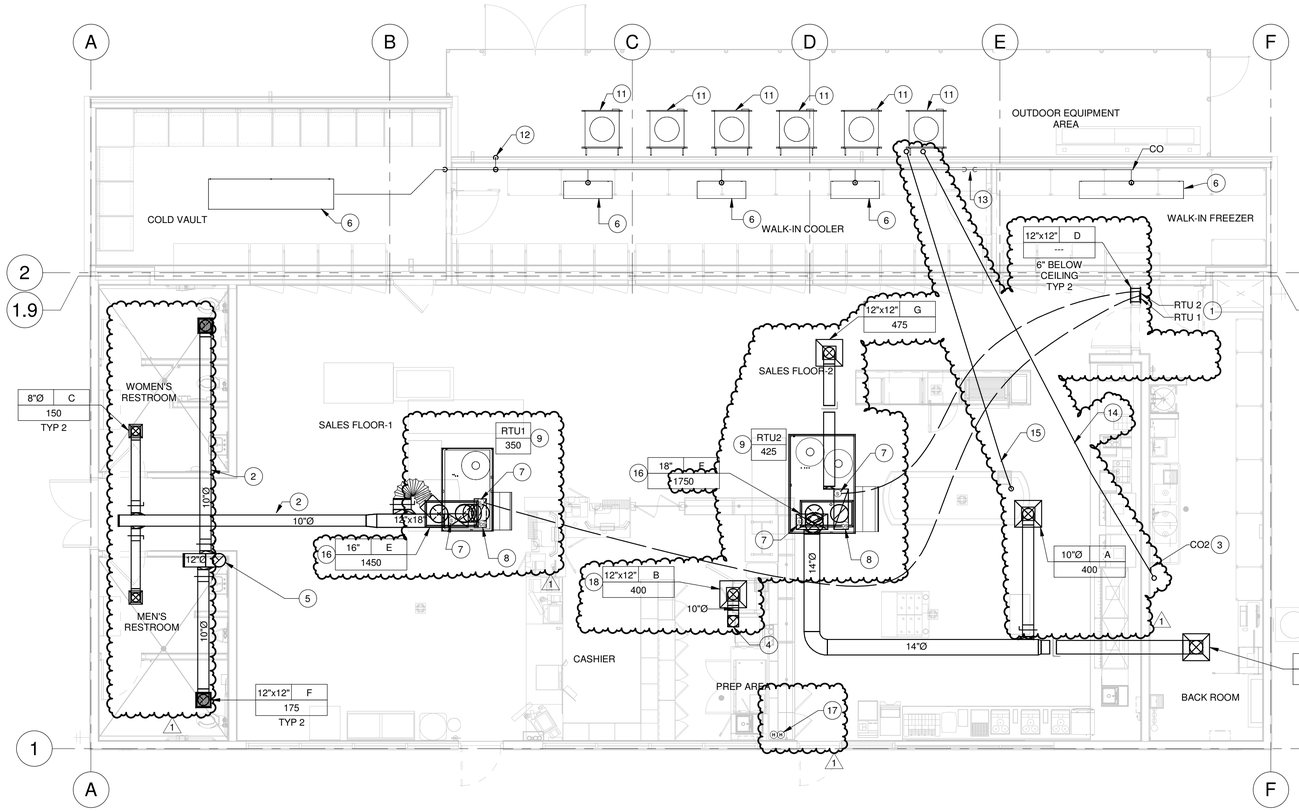

MECHANICAL FLOOR PLAN | 1

3/16" = 1'-0"

KEYNOTES

1 PROGRAMMABLE THERMOSTAT WITH REMOTE TEMPERATURE SENSORS. REF ENERGY MANAGEMENT SYSTEM DRAWING.
2 ROUTE ALL DUCTWORK WITHIN THE JOISTS UNLESS OTHERWISE SPECIFIED (TYPICAL).
3 PROVIDE CO2 DETECTOR AND ALARM. MOUNT 12" AFF. SEE SHEET M1.5 FOR DETAIL OF CO2 DETECTOR AND ALARM.
4 ROUTE DUCT UP TO ROOF MOUNTED EXHAUST FAN. ROOF OPENING SHALL BE 12.5"X12.5". SEE MECHANICAL - SCHEDULES SHEET FOR EXHAUST FAN INFO
5 12" EXHAUST DUCT UP THRU ROOF TO EXHAUST FAN
6 PROVIDE COPPER DRAIN LINES FROM COOLER/FREEZER EVAPORATORS. VERIFY LOCATIONS WITH REFRIGERATION PLANS (EVAPORATORS PROVIDED BY CK/OTHERS). DRAIN LINES IN FREEZER SHALL HAVE HEAT TRACE AND INSULATION. HEAT TRACE SHALL BE SELF REGULATING 120V, 5 W/FT RAY-CHEM XL-TRACE OR EQUIVALENT. REFER TO REFRIGERATION FOR POWER SUPPLY.
1 7 REMOTE TEMPERATURE SENSOR IN RTU SUPPLY AND RETURN DUCTWORK. REF ENERGY MANAGEMENT SYSTEM DRAWING.
8 SMOKE DETECTOR FOR UNIT SHUT-DOWN TO BE FACTORY INSTALLED BY MANUFACTURER.
9 FULL SIZE SUPPLY & RETURN AIR DUCTS DOWN THRU ROOF FROM ROOFTOP PACKAGE UNIT.
10 CO2 LOUVRED CABINET. SEE SHEET M1.4 FOR DETAIL.
11 CONDENSING UNIT FOR REFRIGERATION EQUIPMENT BY VENDOR SHOWN FOR REFERENCE ONLY.
12 COPPER DRAIN LINE FROM COOLERS AND FREEZER EVAPORATORS THRU WALL AT 12" AFF. ROUTE TO GRASSY AREA OR STORM DRAIN VIA AIR GAP AS APPROVED BY THE AHJ. PROVIDE TRAP AT TERMINATION. HEAT TRACE AND INSULATE PIPING EXPOSED TO FREEZING.
13 PROVIDE RUNNING TRAP IN COOLER.
14 PROVIDE PVC CHASE SIMILAR TO KEYNOTE DESCRIPTION FOR DELI CASE. TERMINATE IN BACKROOM
15 MECHANICAL CONTRACTOR SHALL INSTALL A 4" DIAMETER PVC PIPE, SCHEDULE 40, FROM TOP OF SLAB, DOWN BELOW SLAB, OVER TO DELI CASE AND TERMINATE AT SLAB WITH PULL STRING AS SHOWN. THE REFRIGERANT PIPING WILL BE INSTALLED IN THIS PIPE SLEEVE. CONTRACTOR SHALL PROVIDE LONG RADIUS TYPE SWEEP ELBOWS AS REQUIRED. MECHANICAL CONTRACTOR SHALL COORDINATE WITH GENERAL CONTRACTOR THE TIMING OF THIS INSTALLATION. PIPING SHALL BE CAPPED AT OPEN ENDS AS SOON AS IT IS INSTALLED TO PREVENT DIRT, DEBRIS, AND WATER FROM COLLECTING INSIDE OF PIPE. COORDINATE TERMINATION POINT AT SLAB WITH DELI CASE INSTALLATION INSTRUCTIONS. MECHANICAL CONTRACTOR SHALL COORDINATE ELEVATION OF PIPE BELOW SLAB WITH PLUMBING UTILITIES.
16 SUPPLY AND RETURN DUCT TO 24"X48" CONCENTRIC DIFFUSER. PROVIDE DAMPER ON RTU-2 RETURN DUCT TO BALANCE TO 1750 CFM.
17 HUMIDISTATS FURNISHED WITH RTUS. REF ENERGY MANAGEMENT SYSTEM DRAWING FOR WIRING AND FINAL CONNECTION REQUIREMENTS. COORDINATE FINAL LOCATION WITH OWNER.
1 18 INSTALL EXHAUST FAN THERMOSTAT ON EXHAUST DUCT WITH REMOTE SENSOR INSTALLED WITHIN EXHAUST GRILLE. REFER TO FAN SCHEDULE NOTES.

GENERAL NOTES

A. EQUIPMENT SHALL COMPLY WITH ASHRAE STANDARDS.

B. ALL WORK SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES, LAWS, ACTS, AND AUTHORITIES HAVING JURISDICTION.

C. THE COMPLETED INSTALLATION SHALL BE IN ACCORDANCE WITH ALL APPLICABLE INDUSTRY STANDARD OF GOOD PRACTICE AND SAFETY, AND THE MANUFACTURER'S STRICTEST RECOMMENDATIONS FOR EQUIPMENT AND PRODUCT APPLICATION AND INSTALLATION.

D. ALL WORK SHALL BE LOCATED TO PROVIDE ADEQUATE CLEARANCE FOR ARCHITECTURAL DESIGN AND PROPER OPERATION AND SERVICE OF EQUIPMENT.

E. ALL WORK SHALL BE LOCATED TO AVOID CONFLICTS WITH OTHER TRADES. CLOSELY COORDINATE ALL WORK WITH ALL OTHER TRADES. FAILURE OF THE CONTRACTOR TO COORDINATE WITH ALL OTHER TRADES SHALL RELIEVE THE OWNER/ENGINEER FROM ANY ADDED COSTS.

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1	OTB SET	01/05/24

NORTH CAROLINA PROFESSIONAL SEAL 055196 ENGINEER JASON M. SCATES

Jan 04, 2024

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PROJECT MANAGER
SAG

QUALITY CONTROL
JMS

DRAWN BY
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PROJECT NAME

CIRCLE K STORES, INC.

ANGIER, NC

9706 KENNEBEC CHURCH ROAD, ANGIER, NC 27501

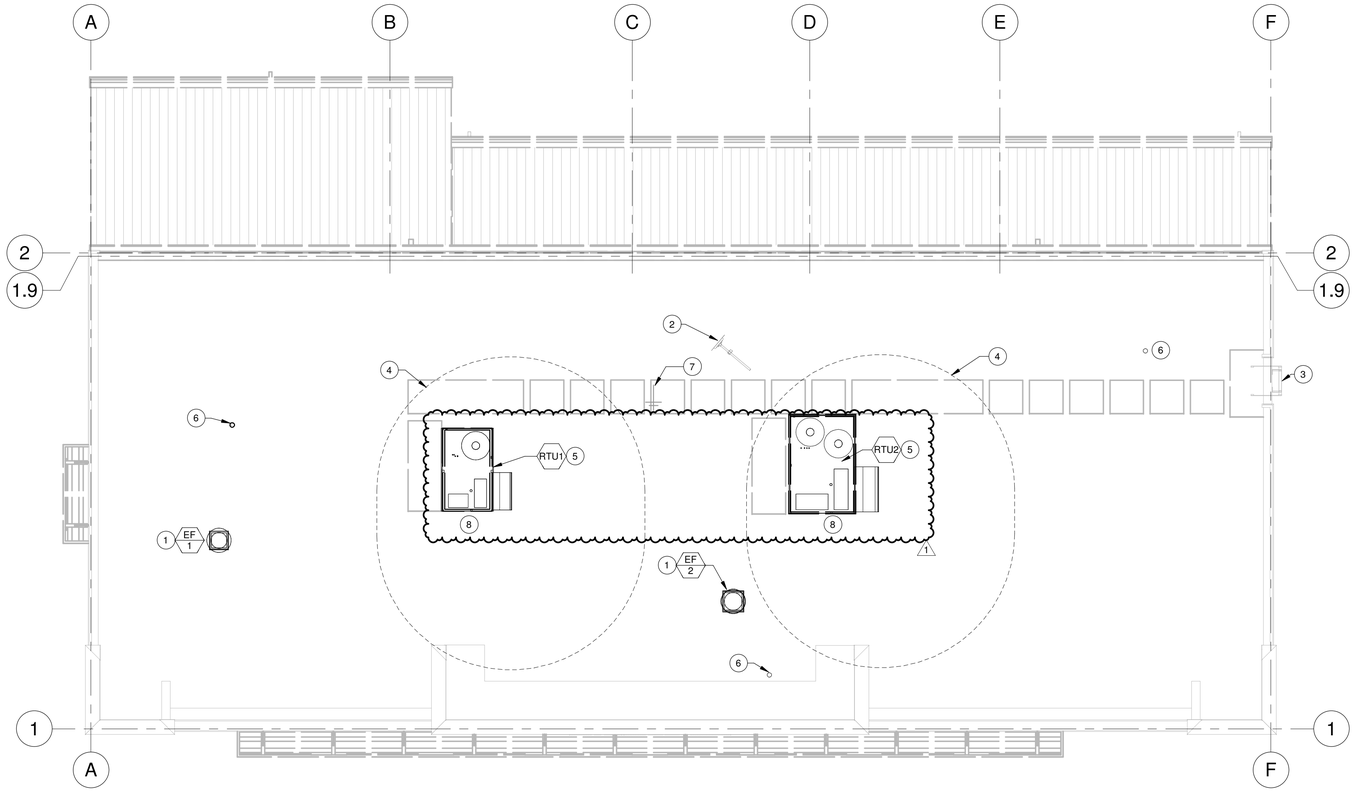
PROTOCYCLE# R1.2 12/XX/22

CIRCLE K STORE INC.

PROJECT NUMBER: 22130

MECHANICAL - FLOOR PLAN

M1.1



MECHANICAL ROOF PLAN | 1

3/16" = 1'-0"

GENERAL NOTES

A. EQUIPMENT SHALL COMPLY WITH ASHRAE STANDARDS.

B. ALL WORK SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES, LAWS, ACTS, AND AUTHORITIES HAVING JURISDICTION.

C. THE COMPLETED INSTALLATION SHALL BE IN ACCORDANCE WITH ALL APPLICABLE INDUSTRY STANDARD OF GOOD PRACTICE AND SAFETY, AND THE MANUFACTURER'S STRICTEST RECOMMENDATIONS FOR EQUIPMENT AND PRODUCT APPLICATION AND INSTALLATION.

D. ALL WORK SHALL BE LOCATED TO PROVIDE ADEQUATE CLEARANCE FOR ARCHITECTURAL DESIGN AND PROPER OPERATION AND SERVICE OF EQUIPMENT.

E. ALL WORK SHALL BE LOCATED TO AVOID CONFLICTS WITH OTHER TRADES. CLOSELY COORDINATE ALL WORK WITH ALL OTHER TRADES. FAILURE OF THE CONTRACTOR TO COORDINATE WITH ALL OTHER TRADES SHALL RELIEVE THE OWNER/ENGINEER FROM ANY ADDED COSTS.

KEYNOTES

1 ROOFTOP EXHAUST FAN INSTALLED ON FACTORY CURB ON ROOF.
2 SATELLITE DISH SHOWN FOR REFERENCE ONLY. REFER TO ARCHITECTURAL DRAWINGS FOR INFO.
3 EXTERIOR ROOF ACCESS SHOWN FOR REFERENCE ONLY. REFER TO ARCHITECTURAL DRAWINGS FOR MORE INFORMATION.
4 PROVIDE MINIMUM 10'-0" SEPARATION FROM OUTSIDE AIR INTAKES ON HVAC UNITS.
5 ROOFTOP HVAC UNIT INSTALLED ON FACTORY CURB ON ROOF.
6 VTR'S SHOWN FOR REFERENCE ONLY. REFER TO PLUMBING DRAWINGS FOR MORE INFORMATION. PROVIDE MINIMUM 10'-0" SEPARATION FROM OUTSIDE AIR INTAKES ON HVAC UNITS.
7 ROOF HOSE BIB REFERENCE PLUMBING SHEETS.
8 DISCHARGE RTU CONDENSATE ONTO ROOF. IF AHJ REQUIRES CONDENSATE TO BE PIPED, PROVIDE ASTM A 53, SCHEDULE 40 GALVANIZED STEEL WITH GALVANIZED MALLEABLE IRON OR GALVANIZED STEEL FITTINGS FOR EXTERIOR PIPING AND SCHEDULE 40 PVC OR TYPE L COPPER FOR INTERIOR PIPING. ROUTE TO AHJ APPROVED LOCATION.

1

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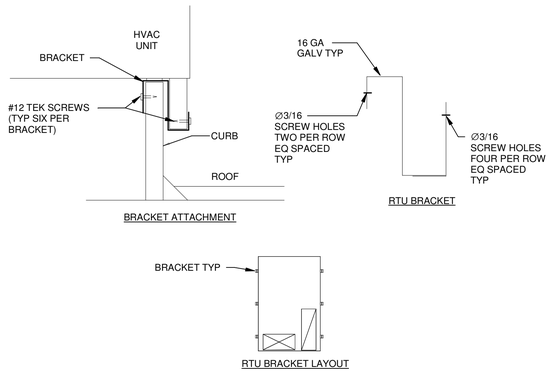
PROTOCYCLE# R1.2 12/XX/22

CIRCLE K STORE INC.

PROJECT NUMBER: 22130

MECHANICAL - ROOF PLAN

M1.1.1



BRACKET ATTACHMENT

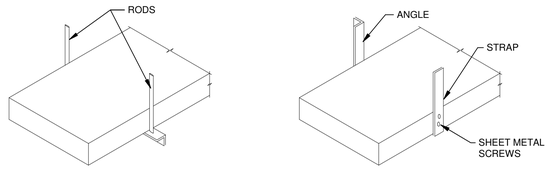
RTU BRACKET

RTU BRACKET LAYOUT

BRACKETS ARE FURNISHED WITH RTU. BRACKET CONSTRUCTION, QUANTITIES, AND SPACING SHOWN ON THIS DETAIL IS FOR GENERAL COORDINATION ONLY. INSTALL BRACKETS ACCORDING TO MANUFACTURER'S INSTALLATION INSTRUCTIONS. COORDINATE FINAL BRACKET LOCATIONS WITH EQUIPMENT. DO NOT OBSTRUCT OPENINGS OR UTILITY CONNECTIONS.

RTU ANCHOR BRACKET DETAIL | 9

N.T.S.

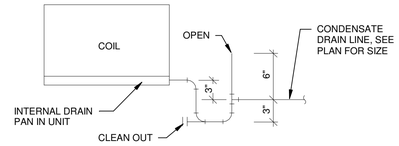


NOTE: USE EITHER ANGLE OR STRAP

REFER TO SMACNA HVAC DUCT CONSTRUCTION STANDARDS TABLE 4-1 FOR "RECTANGULAR DUCT HANGERS MINIMUM SIZE".

RECTANGULAR DUCT HANGER DETAIL | 6

N.T.S.

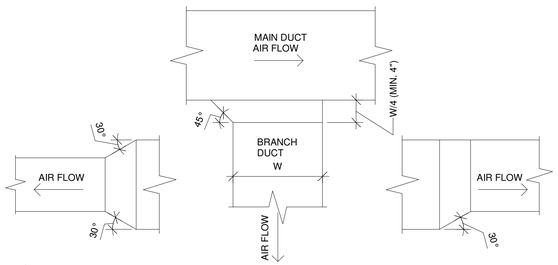


NOTES:

1. CONDENSATE DRAIN LINES SHALL BE GRADED CONTINUOUSLY AND UNIFORMLY TO POINT OF DISCHARGE. MINIMUM OF 1/8" PER FOOT.
2. CONDENSATE DRAIN LINES SHALL BE TYPE "M" HARD DRAWN COPPER TUBING ASTM B-88, UNO.
3. GENERAL CONTRACTOR TO SUPPLY AND INSTALL ALL CONDENSATE DRAINS PER MANUFACTURER'S RECOMMENDATIONS.
4. INSULATE PRIMARY COIL CONDENSATE INSIDE BUILDING IN ACCORDANCE WITH SHEET SPECIFICATIONS

CONDENSATE DRAIN TRAP DETAIL | 3

N.T.S.

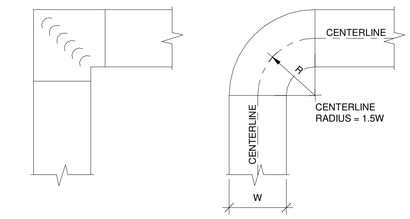


NOTE:

1. FABRICATE PER SMACNA DUCT CONSTRUCTION STANDARDS FIGURE #2-8.
2. DO NOT USE EXTRACTORS IN BRANCH DUCTWORK.

DUCT CONNECTION | 8

N.T.S.



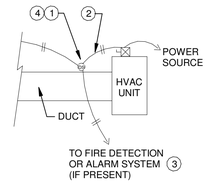
MITERED ELBOW WITH TURNING VANES

RADIUS ELBOW

NOTE: RADIUS ELBOWS WITH MITERED THROAT ARE NOT ALLOWED

DUCT ELBOW DETAILS | 5

N.T.S.

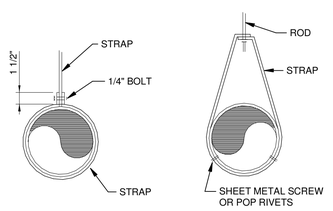


NOTES:

1. "LOW FLOW" TYPE DUCT SMOKE DETECTOR MOUNTED ON THE RETURN AIR DUCT WHERE SHOWN. FURNISHED, INSTALLED, AND CONTROL WIRING BY MECHANICAL CONTRACTOR UNLESS FACTORY INSTALLED IN RTU. POWER WIRING BY ELECTRICAL/FIRE ALARM CONTRACTOR. SEE PLANS FOR ALL LOCATIONS. PROVIDE REMOTE VISIBLE AND AN AUDIBLE SIGNAL ALONG WITH LED BELOW CEILING AS REQUIRED PER 2018 NC MECH CODE AND NFPA.
2. MECHANICAL CONTRACTOR SHALL FURNISH, INSTALL, AND PROVIDE WIRING TO HVAC UNIT TO SHUT DOWN UNIT UPON DETECTION OF SMOKE UNLESS FACTORY INSTALLED IN RTU. MECHANICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY RELAYS, CONTRACTORS, POWER MODULES, ETC. AS NECESSARY TO PROVIDE A COMPLETE OPERATIONAL SYSTEM. COORDINATE WITH ELECTRICAL/FIRE ALARM CONTRACTOR TO VERIFY VOLTAGE REQUIREMENTS, LOCATIONS, ETC.
3. ELECTRICAL/FIRE ALARM CONTRACTOR SHALL PROVIDE WIRING IF FIRE DETECTION OR ALARM SYSTEMS ARE PROVIDED FOR THE BUILDING, THE SMOKE DETECTORS SHALL BE SUPERVISED BY SUCH SYSTEMS.
4. SMOKE DETECTORS REQUIRED BY 2018 NCMC SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 72. DUCT SMOKE DETECTORS REQUIRE A REMOTE LED INDICATOR THRU THE CEILING LEVEL. NFPA 72 3-8.3. DUCT SMOKE DETECTORS SHALL ACTIVATE A VISIBLE AND AUDIBLE SIGNAL AT A NORMALLY OCCUPIED LOCATION AND SHALL BE MONITORED BY THE FACP AND REPORT AS A SUPERVISORY SIGNAL PER NFPA 72 AND THE 2018 NC MECH CODE . DUCT SMOKE DETECTORS TO PROVIDE SHUTDOWN IN 30 SECONDS OR LESS.

DUCT SMOKE DETECTOR CONNECTION DETAIL | 2

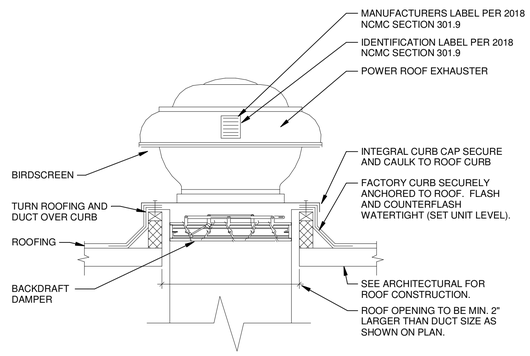
N.T.S.



REFER TO SMACNA HVAC DUCT CONSTRUCTION STANDARDS TABLE 4-2 FOR "MINIMUM HANGER SIZES FOR ROUND DUCT".

ROUND DUCT HANGER DETAIL | 7

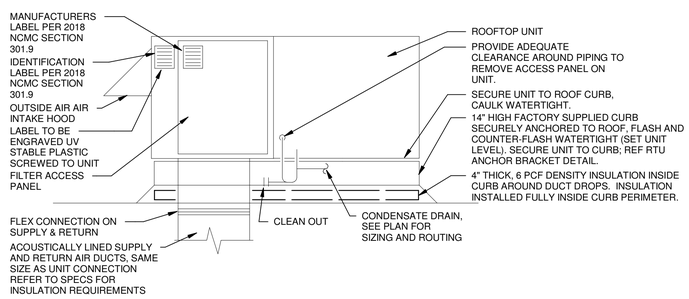
N.T.S.



NOTE: INSTALL EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS

POWER ROOF EXHAUSTER DETAIL | 4

N.T.S.



ROOF-TOP PACKAGE UNIT DETAIL | 1

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Jan 04, 2024

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PROJECT NAME

CIRCLE K STORES, INC.

ANGIER, NC

9706 KENNEBEC CHURCH ROAD, ANGIER, NC 27501

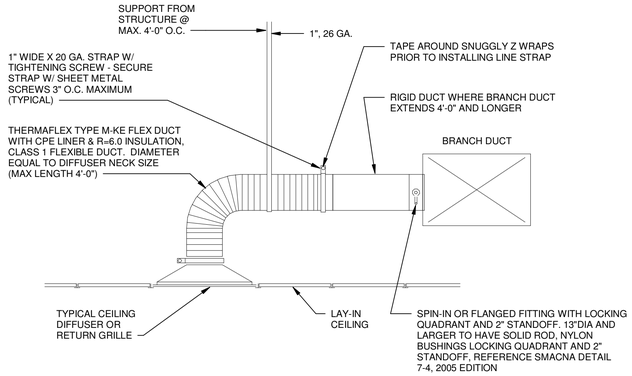
PROTOCYCLE# R1.2 12/XX/22

CIRCLE K STORE INC.

PROJECT NUMBER: 22130

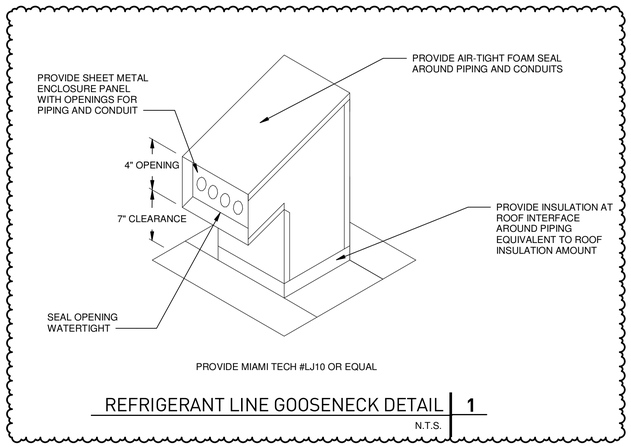
MECHANICAL - DETAILS (1 OF 2)

M1.2



DIFFUSER/GRILLE CONNECTION DETAIL | 2

N.T.S.



REFRIGERANT LINE GOOSENECK DETAIL | 1

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PROTOCYCLE# R1.2 12/XX/22

CIRCLE K STORE INC.

PROJECT NUMBER: 22130

MECHANICAL - DETAILS (2 OF 2)

M1.2.1

OUTSIDE AIR CALCULATION

OUTSIDE AIR REQUIREMENTS PER TABLE 403.3 AND 403.3.1.2, 2018 NCMC

NAME	AREA	# PEOPLE/ 1000 FT²	NUMBER OF PEOPLE	OUTDOOR AIR PER PERSON	OUTDOOR AIR PER AREA	PEOPLE LOAD REQUIRED (PLR) OSA	BUILDING LOAD REQUIRED (BLR) OSA	SYSTEM EFFICENCY VALUE	TOTAL OSA REQUIRED [(PLR+BLR)/SYSTEM EFFICENCY]
RTU1									
CASHIER	201 SF	15	3	7.5 CFM	0.12 CFM/SF	23 CFM	24 CFM	0.8	58 CFM
HALLWAY	60 SF	9	1	0.0 CFM	0.06 CFM/SF	0 CFM	4 CFM	0.8	5 CFM
MEN'S RESTROOM	131 SF		0	0.0 CFM	0.00 CFM/SF	0 CFM	0 CFM	0.8	0 CFM
SALES FLOOR-1	959 SF	15	14	7.5 CFM	0.12 CFM/SF	108 CFM	115 CFM	0.8	279 CFM
WOMEN'S RESTROOM	133 SF		0	0.0 CFM	0.00 CFM/SF	0 CFM	0 CFM	0.8	0 CFM
	1483 SF		18			130 CFM	143 CFM		341 CFM
RTU2									
BACK ROOM	279 SF	15	4	7.5 CFM	0.12 CFM/SF	31 CFM	33 CFM	0.8	81 CFM
PREP AREA	161 SF	15	2	7.5 CFM	0.12 CFM/SF	18 CFM	19 CFM	0.8	47 CFM
SALES FLOOR-2	979 SF	15	15	7.5 CFM	0.12 CFM/SF	110 CFM	117 CFM	0.8	284 CFM
	1418 SF		21			160 CFM	170 CFM		412 CFM
TOTALS	2902 SF		39			290 CFM	313 CFM		754 CFM

AIR BALANCE SCHEDULE

MARK	O.A.	E.A.	PRESSURE
EF 1	0	350 CFM	350 CFM
EF 2	0	300 CFM	300 CFM 1
RTU1	350	0 CFM	350 CFM
RTU2	425	0 CFM	425 CFM
TOTAL EXHAUST	775	650 CFM	125 CFM 1

2018 NCECC LOAD SUMMARY

AREA	COOLING LOAD CALCULATION (MBH)		PROVIDED EQUIPMENT COOLING CAPACITY (MBH)	
	SENSIBLE	TOTAL	SENSIBLE	TOTAL
RTU1	36	58	43.6	61
RTU2	59.7	94	61.7	88.5

NOTES:
1. CALCULATIONS WERE PERFORMED WITH TRANE TRACE 700 SOFTWARE PROGRAM IN COMPLIANCE WITH ASHRAE FUNDAMENTALS.
2. EQUIPMENT SIZING MEETS THE NCECC 403.2.2 REQUIREMENTS
3. ALL MECHANICAL AIR CONDITIONING EQUIPMENT TO HAVE MINIMUM EFFICIENCY RATING PER 2018 NCECC, TABLE C403.2.3. SUBMIT MECHANICAL AC EQUIPMENT TO OWNER OR ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ORDER.

ROOFTOP UNIT SCHEDULE

MARK	MANUFACTURER	MODEL	SUPPLY FAN CFM	SUPPLY FAN ESP (IN.)	SUPPLY FAN HP	COOLING CAPACITY	COOLING ENTERING DRY BULB TEMPERATURE	COOLING ENTERING WET BULB TEMPERATURE	OUTSIDE AIR CFM	WEIGHT (lb)	ELECTRICAL DATA VOLTS	PH	HZ	MCA	MOCP	ELEC HEAT KW	STAGES
RTU1	CARRIER	50FC	1,750	0.75	1.06	5.0 ton	80 °F	67 °F	350	511	208	3	60 Hz	64	70	15.8	1
RTU2	CARRIER	50FC	2,650	0.75	1.76	7.5 ton	80 °F	67 °F	425	743	208	3	60 Hz	98	100	24.0	2

NOTES:
1. SIZE ALL UNITS ON SUMMER AMBIENT TEMPERATURE: 95° F.
2. VERIFY VOLTAGE/PHASE WITH ELECTRICAL CONTRACTOR PRIOR TO ORDERING.
3. COOLING CAPACITY, MINIMUM HEAT CAPACITY AND CFM ARE MINIMUM OUTPUT REQUIRED. ALL UNITS SHALL HAVE NO LESS THAN 98% OF THESE CAPACITIES. COOLING CAPACITY IS GROSS COIL CAPACITY REQUIRED (FAN HEAT NOT DEDUCTED).
4. UNITS TO BE FURNISHED WITH FACTORY INSTALLED RETURN AIR SMOKE DETECTORS.
5. PROVIDE 14" ROOF MOUNTING CURB. VERIFY INSULATION HEIGHT. PROVIDE SEISMIC/WIND RESTRAINT BRACKETS.
6. PROGRAMMABLE THERMOSTAT WITH REMOTE SENSOR FOR RTU1 AND RTU2 BY EMS SUPPLIER. 1
7. PROVIDE RTU1 & RTU2 WITH AUXILIARY HEATER.
8. PROVIDE WITH HAIL GUARDS
9. PROVIDE FACTORY INSTALLED DISCONNECT.
10. PROVIDE WITH UNPOWERED GFCI CONVENIENCE OUTLET.
11. PROVIDE HUMIDI-MIZER OPTION INCLUDING HOT GAS REHEAT COIL AND MANUFACTURER'S HUMIDISTAT. 1
12. PROVIDE CONDENSATE OVERFLOW SHUTDOWN SWITCH.

AIR DEVICE SCHEDULE

MARK	DESCRIPTION	MANUFACTURER	MODEL	FRAME	MATERIAL-MODULE
A	SA	TITUS	TMSA	LAY-IN	STEEL 24X24
B	EA	TITUS	23R	LAY-IN	STEEL 24X24
C	SA	TITUS	TDC	SURFACE MOUNT	STEEL12X12
D	SA	TITUS	33RL	SURFACE MOUNT	STEEL12X12
E	SA,RA	RUSKIN	CDF-16	LAY-IN	ALUM 24X48
F	SA,RA	RUSKIN	CDF-18	LAY-IN	ALUM 24X48
F	EA	TITUS	23R	SURFACE MOUNT	STEEL12X12
G	RA	TITUS	23R	LAY-IN	STEEL 24X24

NOTE:
1. FIELD PAINT ALL DIFFUSERS AND GRILLES - COLOR WHITE
2. SA=SUPPLY AIR
3. EA=EXHAUST AIR
4. RA=RETURN AIR
5. TA=TRANSFER AIR
6. NO DESCRIPTION = CONCENTRIC DIFFUSER
   a. SUPPLY AND RETURN CONNECTIONS MATCH NECK SIZE. 1
7. PROVIDE VOLUME / BALANCE DAMPERS WHERE INDICATED ON PLANS.
   a. ROUND (MANUFACTURER / MODEL): RUSKIN / MDRS25, DAYTON / 21F (OR EQUIVALENT)
   b. RECTANGULAR (MANUFACTURER / MODEL): RUSKIN / MD25, DAYTON / 22CV (OR EQUIVALENT)
8. PROVIDE DEFLECTO DUCT CONNECTION TRANSITION AS PER PLANS. 1
9. PROVIDE MANUFACTURER'S SECTORIZING BAFFLES WHERE INDICATED BY FLOW ARROWS ON PLAN. USE A 4-WAY THROW IF NO THROW ARROWS ARE SHOWN.

EXHAUST FAN SCHEDULE

Mark	AREA SERVED	MANUFACTURER	MODEL	FLOW	ESP	MOTOR POWER	MOTOR VOLTAGE	MOTOR PH	MOTOR HZ	WEIGHT	DRIVE
EF 1	RESTROOMS	GREENHECK	G-090-E	350 CFM	0.20 in-wg	0.040 hp	120 V	1	60 Hz	22.00 lb	DIRECT
EF 2	PREP AREA	GREENHECK	CUE-080-E	300 CFM	0.25 in-wg	0.100 hp	120 V	1	60 Hz	33.00 lb	DIRECT

NOTES:
1. EF 1 SHALL BE PROVIDED WITH BACKDRAFT DAMPER, FACTORY ROOF CURB, AND SPEED CONTROLLER.
2. EF 2 SHALL PROVIDED WITH BACKDRAFT DAMPER, FACTORY ROOF CURB, SPEED CONTROLLER. FAN SHALL BE UL LISTED. INSTALL FAN LEVEL. FAN CONTROLLED FROM LINE VOLTAGE THERMOSTAT TEMPRO TP516 OR EQUIVALENT FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR, WIRING AND FINAL TERMINATIONS BY ELECTRICAL CONTRACTOR. LOCATE THERMOSTAT REMOTE SENSOR WITHIN CEILING EXHAUST GRILLE. INSTALL THERMOSTAT IN ACCESSIBLE LOCATION ON EXHAUST DUCT ABOVE CEILING. SET TO 90°F. 1
3. EF 1 TO RUN CONTINUOUSLY WHILE OCCUPIED.

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REVISIONS

△	ISSUE	DATE
	OTP	02/15/23
1	OTB SET	01/05/24

NORTH CAROLINA PROFESSIONAL SEAL 055196 ENGINEER JASON M. SCATES

Jan 04, 2024

PROFESSIONAL IN CHARGE
JMS

PROJECT MANAGER
SAG

QUALITY CONTROL
JMS

DRAWN BY
JBA

PROJECT NAME

CIRCLE K STORES, INC.

ANGIER, NC

9706 KENNEBEC CHURCH ROAD,
ANGIER, NC 27501

PROTOCYCLE# R1.2 12/XX/22

CIRCLE K STORE INC.

PROJECT NUMBER: 22130

MECHANICAL - SCHEDULES

M1.2.2

ABBREVIATIONS

ABBR	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
EMS	ENERGY MANAGEMENT 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
UNO	UNLESS NOTED OTHERWISE
V	VOLTS
VAC	VOLTS, ALTERNATING CURRENT
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VERT	VERTICAL
VTR	VENT THRU ROOF
WB	WET BULB
WCO	WALL CLEANOUT

ABBREVIATIONS

ABBR	DESCRIPTION
WH	WALL HYDRANT
Z	ZONE

PIPING FLOWSTREAM ID

SYMBOL	DESCRIPTION
D	DRAIN LINE
CD	CONDENSATE DRAIN
SCD	SECONDARY CONDENSATE DRAIN

PIPE FITTING SYMBOLS

SYMBOL	DESCRIPTION
	ANCHOR
	ANCHOR, WALL
	BLIND FLANGE
	DROP AT END
	DROP AT MID
	TOP CONNECTION, 45° OR 90°
	BOTTOM CONNECTION, 45° OR 90°
	TEE CONNECTION
	CAPPED OUTLET
	PIPE CAP
	RISE IN PIPE
	PIPE GUIDES
	PIPE PLUG
	FLEX CONNECTION
	FLEX PIPE
	PRESSURE GAGE W/O COCK
	PRESSURE GAUGE W/ COCK
	REDUCER OR INCREASER
	ECCENTRIC REDUCER
	STRAINER
	STRAINER, FLANGED
F	SWITCH, FLOW
P	SWITCH, PRESSURE
T|	SWITCH, TEMPERATURE
	TEST & PRESSURE (T&P) FITTING
	THERMOMETER
	UNION
	ORIFICE UNION
	FLANGED UNION
DN	SLOPE IN DIRECTION SHOWN (DOWN)
	DIRECTION OF FLOW
	NEW PIPING
	EXISTING PIPING TO REMAIN
	EXISTING PIPING TO BE REMOVED
	NEW PIPE CONNECTION TO EXISTING PIPING
	POINT OF NEW CONNECTION TO EXISTING

ANNOTATION SYMBOLS

SYMBOL	DESCRIPTION
?	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
	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
	POINT OF NEW CONNECTION TO EXISTING
	FLOW ARROWS
V12	OVAL SYMBOL INDICATES A CONTROL VALVE V-NUMBER REFERS TO A SPECIFIC VALVE IDENTIFIED IN THE CONTROL VALVE SCHEDULE

DUCTWORK SYMBOLS

SYMBOL	DESCRIPTION
12x8	RECTANGULAR DUCT, WIDTH x DEPTH (INCHES)
12Ø	ROUND DUCT (INCHES)
12xØ	OVAL DUCT (INCHES)
	FLEXIBLE DUCT
12x8 W/1"AL	ACOUSTICAL DUCT LINING
	FLEXIBLE CONNECTION
	SUPPLY DUCT - SECTION/ END VIEW
	RETURN DUCT - SECTION/ END VIEW
	EXHAUST DUCT - SECTION/ END VIEW
	CROSS SECTION THROUGH ROUND DUCT
	VANED ELBOW (PROVIDE ALL SQUARE OR RECTANGULAR ELBOWS WITH VANES EXCEPT TRANSFER AIR SOUND ELBOW)
	LARGE RADIUS ELBOW
	SMALL RADIUS ELBOW
	RETURN AIR CEILING GRILLE AND RETURN AIR CEILING GRILLE WITH SOUND BOOT
	CEILING DIFFUSERS (ARROWS DENOTE THROW PATTERN IF THROW IS SOMETHING OTHER THAN 4-WAY)
	EXHAUST CEILING REGISTER OR GRILLE
	LINEAR DIFFUSER
	ROUND DIFFUSER
	SIDEWALL EXHAUST OR RETURN AIR GRILLE
	SIDEWALL SUPPLY REGISTER
	DIFFUSER UNDER DUCT
1	POINT OF NEW CONNECTION TO EXISTING
T	ROOM THERMOSTAT
HUM HUMIDISTAT 1	
S	ROOM TEMPERATURE SENSOR
DS	DUCT SMOKE DETECTOR (DS)
	ACCESS DOOR
	MANUAL VOLUME DAMPER (VD)
	FIRE DAMPER (FD) THROUGH WALL/ FLOOR
	FIRE/SMOKE DAMPER (FSD) THROUGH WALL/ FLOOR
M	MOTOR OPERATED DAMPER
	CONNECT NEW DUCT TO EXISTING DUCT
	EXISTING DUCT
	EXISTING DUCT TO BE REMOVED
	30° RISE(R)/DROP(D) IN DUCTWORK IN DIRECTION OF ARROW
	CONCENTRIC DUCT REDUCER
	ECCENTRIC DUCT REDUCER
	DUCT TRANSITION FROM RECTANGULAR TO ROUND
	CONICAL TAP FITTING
	SHOE TAP FITTING
	DUCT OVER/UNDER ANOTHER DUCT

SINGLE LINE DUCTWORK

SYMBOL	DESCRIPTION
N	NEW
E	EXISTING
R	RELOCATED
	NEW/RELOCATED SUPPLY DIFFUSER, NECK SIZE, AND BALANCE AIR AS INDICATED (MATCH EXISTING)
	NEW/RELOCATED RETURN GRILLE WITH BOOT (MATCH EXISTING)
	EXISTING SUPPLY DIFFUSER
	EXISTING RETURN GRILLE WITH BOOT
	RELOCATED EXISTING GRILLE OR DIFFUSER
T R	RELOCATED ROOM THERMOSTAT, ELECTRIC
T E	EXISTING ROOM THERMOSTAT, ELECTRIC
	1-1/2 X BRANCH DUCT FROM SIDE OF MAIN
	SQUARE ELBOW WITH TURNING VANES
	RADIUS TYPE 90° ELBOW
	DUCT TRANSITION
	ACCESS PANEL (AP)
	EXISTING DUCTWORK
	EXISTING DUCT TO BE REMOVED
	FLEXIBLE DUCT

AIR TERMINAL SYMBOLS

SYMBOL	DESCRIPTION
X A CFM TYP #	MARK (AS SHOWN ON SCHEDULE) NECK SIZE (Ø DIA. OR H" x W" RECTANG.) CFM TYPICAL OF NUMBER SHOWN ON SYSTEM, OR INSTALL NOTE.

GENERAL NOTES

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

B. 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.

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

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

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

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

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

H. REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF ALL FIRE RATED AND/OR SMOKE RATED WALLS AND ASSEMBLIES. PROVIDE APPROVED FIRE AND FIRE/SMOKE DAMPERS IN ALL REQUIRED PENETRATIONS FOR DUCTWORK, GRILLES, REGISTERS AND DIFFUSERS. ALL PIPE AND DUCTWORK PENETRATIONS OF FIRE, SMOKE AND FULL HEIGHT WALLS SHALL BE CAULKED AIRTIGHT TO THE ADJACENT STRUCTURE BY MEANS OF U.L. APPROVED FIRE PROOF CAULKING MATERIAL.

I. 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.

J. 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.

K. 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.

L. 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".

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

CODE INFORMATION

2018 NORTH CAROLINA BUILDING CODE(NCBC), 2018 NORTH CAROLINA MECHANICAL CODE (NCMC), 2018 NORTH CAROLINA ENERGY CONSERVATION CODE (NCECC) AND 2018 NORTH CAROLINA PLUMBING CODE (NCPC).

ALL SYSTEMS SHALL BE IN COMPLIANCE WITH THE ABOVE CODES AS ADOPTED BY THE CITY OF ANGIER, NC.

OUTDOOR AIR VENTILATION PROVIDED AND BASED ON CHAPTER 4, SECTION 403.2 AND TABLE 403.3.

SEE SHEET M1.2.2 FOR VENTILATION CALCULATIONS.

ALL ROOFTOP EQUIPMENT SHALL BE PERMANENTLY IDENTIFIED AS TO THE AREA SERVED WITH A RUST-PROOF METAL NAMEPLATE PER 2018 NCMC.

DUCT SMOKE DETECTORS REQUIRED BY 2018 NCMC SECTION 606 SHALL BE INSTALLED IN THE RETURN DUCTWORK AS SHOWN ON THE PLANS PER NCMC 606.2.1, 606.2.2, 606.3, AND NFPA 72. IF A FIRE ALARM SYSTEM IS AVAILABLE, THAT THE DUCT SMOKE DETECTOR(S) SHALL BE CONNECTED TO THE FIRE ALARM SYSTEM (NCMC 606.4.1) 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) AS REQUIRED BY 2018 NCMC 606.4.1, EXCEPTION 2.

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 2018 NCMC SECTION 304.1.

ACCESS TO ROOF MOUNTED EQUIPMENT COMPLIES WITH 2018 NCMC. SEE ARCHITECTURAL DRAWINGS FOR ROOF ACCESS DETAILS.

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.

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 SECTION 403 (2018 NCMC SECTION 403.3).

2018 NCECC 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 20XX 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). 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.

M. WATER-HEATING EQUIPMENT AND HOT WATER STORAGE TANKS SHALL MEET THE REQUIREMENTS OF TABLE 404.2 OF THE 2018 NCECC. THE EFFICIENCY SHALL BE VERIFIED THROUGH DATA FURNISHED BY THE MANUFACTURER OR THROUGH CERTIFICATION UNDER AN APPROVED CERTIFICATION PROGRAM.

N. SERVICE WATER-HEATING EQUIPMENT MUST BE PROVIDED WITH CONTROLS THAT ALLOW THE USER TO SET WATER TEMPERATURE TO 100 DEGREES F FOR DWELLING UNITS AND 90 DEGREES F FOR OTHER OCCUPANCIES. CONTROL MUST LIMIT OUTPUT TEMPERATURES OF LAVATORIES IN PUBLIC FACILITY REST ROOMS TO 110 DEGREES F.

O. WATER-HEATING EQUIPMENT NOT PROVIDED WITH INTEGRAL HEAT TRAPS AND SERVING NON-CIRCULATING SYSTEMS SHALL BE PROVIDED WITH HEAT TRAPS ON THE SUPPLY AND DISCHARGE PIPING ASSOCIATED WITH THE EQUIPMENT.

P. FOR AUTOMATIC-CIRCULATING HOT WATER SYSTEMS, PIPING SHALL BE INSULATED WITH 1" OF INSULATION HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 BTU-IN/(H xFT2x°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 xFT2x°F).

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.

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△	ISSUE	DATE
	OTP	02/15/23
1	OTB SET	01/05/24

NORTH CAROLINA PROFESSIONAL SEAL 051196 ENGINEER JASON M. SCATES

Jan 04, 2024

PROFESSIONAL IN CHARGE
JMS

PROJECT MANAGER
SAG

QUALITY CONTROL
JMS

DRAWN BY
JBA

PROJECT NAME

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ANGIER, NC

9706 KENNEBEC CHURCH ROAD, ANGIER, NC 27501

PROTOCYCLE# R1.2 12/XX/22

CIRCLE K STORE INC.

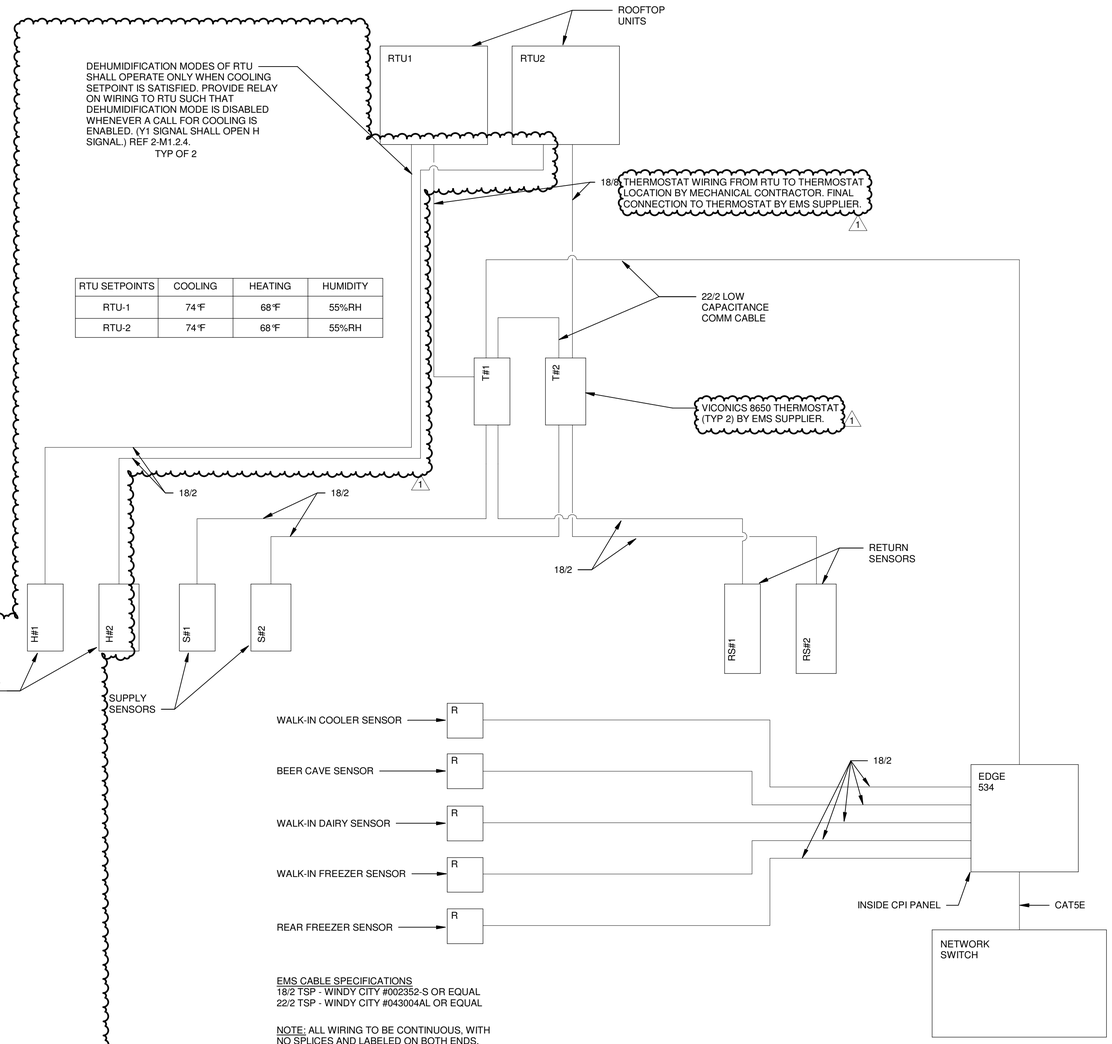
PROJECT NUMBER: 22130

MECHANICAL - NOTES

M1.2.3

GENERAL EMS NOTES

1. REFERENCE MECHANICAL NOTES SHEET AND MECHANICAL SPECIFICATIONS FOR CONTROLS INFORMATION.
2. TERMINATIONS SHALL BE MADE IN ACCORDANCE WITH EMS SUPPLIER INSTRUCTIONS. NO FOIL OR UNUSED WIRE(S) SHALL BE EXPOSED AFTER APPLICATION OF HEAT SHRINK.
3. MINOR CHANGES IN MATERIALS OR TERMINATION POINTS SHALL NOT INCREASE CONTRACT COST.
4. ROUTE EMS CONDUITS CONCEALED IN SALES AREA.



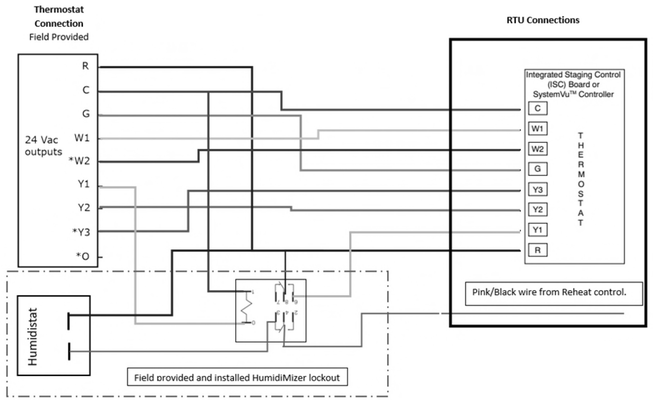
RTU SETPOINTS	COOLING	HEATING	HUMIDITY
RTU-1	74°F	68°F	55%RH
RTU-2	74°F	68°F	55%RH

EMS CABLE SPECIFICATIONS
18/2 TSP - WINDY CITY #002352-S OR EQUAL
22/2 TSP - WINDY CITY #043004AL OR EQUAL

NOTE: ALL WIRING TO BE CONTINUOUS, WITH NO SPLICES AND LABELED ON BOTH ENDS.

EMS RISER | 1
N.T.S.

Electro-mechanical W/ HumidiMizer Lockout



CARRIER ELECTROMECHANICAL W/ HUMIDIMIZER LOCKOUT | 2
N.T.S.

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ENERGY MANAGMENT SYSTEM

M1.2.4

SECTION	MECHANICAL SPECIFICATIONS
15010 BASIC MECHANICAL REQUIREMENTS	1. ALL WORK TO BE DONE AND MATERIALS FURNISHED COMPLYING WITH APPLICABLE LAWS, AND RESOLUTIONS, INCLUDING THE CURRENTLY ENFORCED VERSIONS OF THE INTERNATIONAL MECHANICAL CODE (IMC), INTERNATIONAL PLUMBING CODE (IPC), INTERNATIONAL BUILDING CODE (IBC), AND LOCAL, STATE, AND FEDERAL FIRE SAFETY CODES (NFPA). 2. ALL MATERIALS USED SHALL BE NEW AND UNDAMAGED. 3. ALL WORK PERFORMED SHALL BE IN ACCORDANCE WITH CURRENT CONSTRUCTION INDUSTRY STANDARDS AND WORKMANSHIP. 4. PRIOR TO SUBMITTING A PROPOSAL, THE CONTRACTOR SHALL VISIT THE SITE AND THOROUGHLY INSPECT ALL EXISTING CONDITIONS TO ENSURE THAT THE WORK REPRESENTED ON THE DRAWINGS AND THESE SPECIFICATIONS CAN BE INSTALLED AS INDICATED. 5. AT SUBSTANTIAL COMPLETION OF THE CONSTRUCTION, FURNISH AS-BUILT PLANS TO ARCH/ENGINEER FOR APPROVAL BEFORE THEY ARE TURNED OVER TO OWNER. 6. ALL MANUFACTURED EQUIPMENT, ACCESSORIES AND MATERIALS SHALL BE USED AS INTENDED BY THE MANUFACTURER, IN STRICT ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS. 7. THE MECHANICAL CONTRACTOR SHALL PROVIDE, IN ADDITION TO ANY OTHER WARRANTIES SPECIFIED, A ONE(1) YEAR FULL LABOR AND MATERIAL WARRANTY ON ALL WORKMANSHIP, MATERIAL AND EQUIPMENT FURNISHED FOR THIS PROJECT. THE CONTRACTOR SHALL REPLACE ALL DEFECTIVE WORKMANSHIP, EQUIPMENT, AND MATERIALS WITHOUT ADDITIONAL CHARGES, INCLUDING ALL REFRIGERANT CAUSED TO BE LOST BY REPAIR OF DEFECTIVE WORK OR MATERIALS. 8. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR INSTRUCTING THE OWNER IN PROPER OPERATION AND MAINTENANCE OF THE EQUIPMENT. A WIRING DIAGRAM WITH INSTRUCTIONS FOR THE OPERATION, INSTALLER'S NAME, PHONE NUMBER, MODEL, AND MAKE OF EQUIPMENT PROVIDED, ETC., SHALL BE FURNISHED TO OWNER. AT A TIME DESIGNATED, PROVIDE AN ENGINEER OR MECHANIC TO GO OVER SYSTEM WITH OWNER'S REPRESENTATIVE TO THOROUGHLY FAMILIARIZE HIM WITH THE OPERATION AND MAINTENANCE OF THE SYSTEM. 9. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL OPENINGS AND REQUIRED LINTELS NEEDED FOR GENERAL CONTRACTOR FOR THE INSTALLATION OF MECHANICAL EQUIPMENT. 10. SAWCUTS, LINTELS, HEADERS, AND STRUCTURAL MODIFICATIONS TO THE BUILDING STRUCTURE NEEDED FOR THE INSTALLATION OF MECHANICAL EQUIPMENT SHALL BE APPROVED BY THE GENERAL CONTRACTOR, BEFORE INSTALLATION. 11. IN GENERAL, OPENINGS AND REQUIRED LINTELS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING DETAILS AND TEMPLATES OF ALL OPENINGS NECESSARY FOR MECHANICAL EQUIPMENT INSTALLATION INCLUDING: HOUSING, ACCESS DOORS, INSPECTION DOORS, AND PASSAGE WAYS FOR MECHANICAL EQUIPMENT. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR SEALING CRACKS AND FINISHING ROUGH EDGES LEFT FOLLOWING MECHANICAL INSTALLATION. 12. THE USE OF THE MECHANICAL EQUIPMENT FOR HEATING, COOLING, OR DRYING DURING CONSTRUCTION IS PROHIBITED, UNLESS APPROVED BY WRITTEN DOCUMENTATION BY THE OWNER. 13. ALL OTHER MANUFACTURERS BESIDES THE SPECIFIED PRODUCT MUST BE PRE-APPROVED PRIOR TO BIDDING. SUBMIT DETAILED EQUIPMENT CUT-SHEETS AND CLEARLY IDENTIFY ANY DIFFERENCES FROM THE SPECIFIED PRODUCT. ANY EQUIPMENT SUBMITTED DURING THE REGULAR SUBMITTAL PROCESS THAT WAS NOT PRE-APPROVED WILL BE AUTOMATICALLY BE REJECTED. 14. PERMITS AND INSPECTIONS: MECHANICAL CONTRACTOR IS RESPONSIBLE TO OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND LICENSES. WHEN REQUIRED BY CODE, ALL WORK MUST BE INSPECTED AND APPROVED BY LOCAL AUTHORITIES. PRIOR TO FINAL APPROVAL, FURNISH THE ARCHITECT/OWNER WITH CERTIFICATES OF INSPECTION AND APPROVALS BY LOCAL AUTHORITIES. 15. PRIOR TO SUBMITTING BID, THE MECHANICAL CONTRACTOR SHALL CAREFULLY EXAMINE THE PLANS FOR THE PROPER FITTING OF THE MATERIAL AND APPARATUSES INTO THE BUILDING. ARRANGE WORK SCHEDULE FOR MINIMUM INTERFERENCE WITH THE WORK OF OTHER TRADES. SHOULD THE PARTICULAR EQUIPMENT PROPOSED FOR INSTALLATION REQUIRE OTHER ARCHITECTURAL, STRUCTURAL, PLUMBING, OR ELECTRICAL CONDITIONS THAT THOSE SHOWN, ARRANGE FOR SUCH SPACE BEFORE SUBMITTING BID. ALL CHANGES NECESSITATED BY THE FAILURE TO COMPLY WITH THIS CLAUSE, SHALL BE MADE AT NO ADDED EXPENSE TO THE OWNER. 16. WITHIN 10 DAYS AFTER AWARD OF CONTRACT, SUBMIT (4) COPIES OF A COMPLETE WRITTEN LIST OF ALL MAJOR ITEMS OF EQUIPMENT AND MATERIALS AS WELL AS ADDITIONAL COPIES, THAT THE CONTRACTOR MAY NEED RETURNED. THE SUBMITTAL SHALL DEFINITELY AND CLEARLY STATE WHERE SUBMITTED EQUIPMENT DOES NOT AGREE WITH THE CONTRACT DOCUMENTS, AND LIST DEVIATIONS IN COLOR OTHER THAN RED. SUBMIT ALL ITEMS AT ONE TIME AND IN A NEAT AND ORDERLY MANNER. PARTIAL LISTS WILL NOT BE ACCEPTABLE. SUBMITTALS SHALL INCLUDE MANUFACTURER'S SPECIFICATIONS, PHYSICAL DIMENSIONS AND RATINGS OF ALL EQUIPMENT SUBMITTED. SUBMITTALS SHALL BE INDEXED, SEPARATED BY DIVIDERS, AND BOUND IN LOOSE LEAF RING BINDERS.
15140 SUPPORTS AND ANCHORS	1. FURNISH PIPE AND DUCT HANGERS, WHERE REQUIRED, FIRMLY SUPPORTED FROM BUILDING STEEL, CONCRETE OR MASONRY STRUCTURE. 2. SUPPORT PIPING SYSTEMS SECURELY WHILE ALLOWING FOR PIPE AND BUILDING EXPANSION AND CONTRACTION. PROVIDE COPPER PLATED HANGERS FOR COPPER PIPE. USE ADJUSTABLE STEEL BAND HANGERS. MAXIMUM SPACING SHALL BE 5' FOR 1/2" PIPING, 7' FOR 3/4" TO 1-1/4" PIPING, AND 9' FOR 1-1/2" PIPING. 3. FURNISH MECHANICAL EQUIPMENT SUPPORTS AS DETAILED OR AS REQUIRED TO SAFELY AND PERMANENTLY CARRY THE WEIGHT OF THE EQUIPMENT.
15250 MECHANICAL INSULATION	1. INSULATE ALL METAL SUPPLY AND RETURN DUCTWORK WITH 2" FOIL BACKED FIBERGLASS INSULATION. IN UNHEATED ATTICS OR IN AREAS LOCATED ABOVE THE LINE OF BUILDING INSULATION, INSULATE ALL DUCTWORK, INCLUDING RETURN AIR AND EXHAUST AIR DUCTWORK, WITH 3" FOIL-BACKED INSULATION, AND REQUEST THAT GENERAL CONTRACTOR BLOW ATTIC INSULATION OVER THE TOP OF THE INSULATED DUCTWORK, EXPOSED SPIRAL DUCTWORK, OR DUCTWORK LOCATED WITHIN A HEATED SPACE DOES NOT REQUIRE INSULATION. 2. LINE ALL SUPPLY AND RETURN DUCTWORK WITHIN FIFTEEN (15) FEET OF SUPPLY FAN WITH 1/2" DUCT LINER TO REDUCE SOUND. 3. ALL INSULATION MATERIALS TO HAVE A FLAME SPREAD RATING OF 25 OR LESS AND SMOKE DEVELOPMENT RATING OF 50 OR LESS AS TESTED BY ASTM E-84, UL-723, NFPA 90A-90-B.
15782 ROOF-TOP UNITS	1. THE OWNER SHALL FURNISH AND GENERAL CONTRACTOR SHALL INSTALL PACKAGED ROOF-TOP UNIT(S) AS SHOWN AND SCHEDULED. THE UNIT(S) SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS, AND SHALL PERFORM AT THE CONDITIONS SCHEDULED. 2. THE MECHANICAL CONTRACTOR SHALL PROVIDE TWO (2) SETS OF FILTERS FOR EACH UNIT AND SHALL BE RESPONSIBLE FOR CHANGING FILTERS WITHIN TWO (2) WEEKS OF START-UP. 3. THE MECHANICAL CONTRACTOR SHALL PROVIDE A SINGLE POWER SOURCE CONNECTION DISCONNECT AND A 15 AMP DUPLEX, WEATHERPROOF CONVENIENCE OUTLET BOX FOR EACH ROOF TOP UNIT INSTALLED.
15783 CONDENSATE AND COOLER DRAINS	1. 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. 2. ALL PIPING SHALL CONFORM TO ASTM B88-72. 3. FITTINGS SHALL WROUGHT COPPER, DRAINAGE TYPE FOR LINES 1-1/4" AND LARGER. SOLDER WITH 50/50 SOLDER.

SECTION	MECHANICAL SPECIFICATIONS
15853 POWERED VENTILATORS	1. THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL VENTILATOR(S) AND/OR EXHAUST FAN(S) AS SHOWN AND SCHEDULED. THE UNIT(S) SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS, AND SHALL PERFORM AT THE CONDITIONS SCHEDULED. 2. INSTALL VENTILATOR(S) AND/OR EXHAUST FAN(S) WITH CLEARANCES FOR SERVICE AND MAINTENANCE. 3. THE MECHANICAL CONTRACTOR SHALL PROVIDE ONE (1) BACKDRAFT DAMPER FOR EACH VENTILATOR AND/OR EXHAUST FAN, OR SHALL VERIFY A BACKDRAFT DAMPER HAS BEEN FACTORY INSTALLED. 4. THE MECHANICAL CONTRACTOR SHALL ADJUST DAMPER LINKAGES FOR PROPER OPERATION.
15891 METAL DUCTWORK SYSTEMS	1. ALL DUCTWORK SHALL BE CONSTRUCTED FROM HOT NEW DIPPED GALVANIZED SHEET IRON OR STEEL, ASTM A-120, IN COMPLIANCE WITH 20XX I.M.C. CHAPTER 6, AND SMACNA HVAC DUCT CONSTRUCTION STANDARDS FOR GAGE AND REINFORCEMENT. ALL DUCTWORK SHALL BE SEALED AND INSULATED IN ACCORDANCE WITH NCECC. 2. 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. 3. ROUND FLEX DUCT SHALL BE USED FOR DIFFUSER-GRILL CONNECTIONS ABOVE LAY-IN CEILINGS. FLEXDUCT MAY BE USED IN OTHER AREAS WHERE THE DUCT AND GRILLE ARE PERMANENTLY AND REASONABLY ACCESSIBLE. MAXIMUM FLEX DUCT LENGTH IS 5'-0" AND THE DUCTWORK SHALL BE PRE-LINED WITH 1" INSULATION. PERFORMANCE OF FLEXIBLE DUCT SHALL MEET OR EXCEED THE RIGID DUCTWORK. 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. PAINT ALL DUCTWORK, TURNING VANES, INSULATION ECT., THAT IS VISIBLE THROUGH GRILLES, REGISTERS, OR CEILING DIFFUSERS FLAT BLACK. 6. TAPE ALL JOINTS IN SHEET METAL DUCTWORK WITH ARABOL AND CANVAS OR EQUAL ADHESIVE. 7. FLEXIBLE CONNECTIONS SHALL BE 30 OUNCE, CLOSELY WOVEN, NEOPRENE COATED GLASS FABRIC THAT IS FIRE RETARDENT, WEATHERPROOF AND AIRTIGHT, A MINIMUM OF 6" WIDTH. 8. FABRICATE ALL SHEET METAL DUCTS OF PRIME GRADE, LOCKING FORMING QUALITY GALVANIZED STEEL SHEETS USING GAUGES OF METAL AND REINFORCING BETWEEN JOINTS AS FOLLOWS A. 12" AND SMALLER (LONGEST SIDE)-24 GAUGE B. 13"-18" (LONGEST SIDE) - 24 GAUGE. C. 19"-30" (LONGEST SIDE) - 24 GAUGE, WITH 1"x1"x1/8" ANGLES AT 5 FT. ON CENTER D. 31"-42" (LONGEST SIDE) - 22 GAUGE, WITH 1"x1"x1/8" ANGLES AT 5 FT. ON CENTER 9. DUCT LINER SHALL HAVE A FLAME SPREAD AND SMOKE DEVELOPMENT 25 OR LESS AND 50 OR LESS WHEN TESTED BY ASTM E-84 (NFPA 255) METHOD. 10. 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.
15910 DUCT ACCESSORIES	1. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING VOLUME DAMPERS, TURNING VANES, ACCESS DOORS, VIBRATION ISOLATORS, ETC. 2. THE ACCESSORIES SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
15975 TEMPERATURE CONTROLS	1. THE OWNER SHALL FURNISH OR CONTRACT A TEMPERATURE CONTROL CONTRACTOR TO FURNISH ALL MOTORS, DRIVES, CONTROLLERS INTEGRAL TO THE MECHANICAL EQUIPMENT SYSTEM, AND FACTORY MOUNTED CONTROLS FOR ALL MECHANICAL EQUIPMENT. 2. THE MECHANICAL CONTRACTOR OR CONTRACTED TEMPERATURE CONTROL CONTRACTOR SHALL FURNISH AND INSTALL ALL SWITCHES, FIRE STATS, FREEZE STATS, THERMOSTATS, TIMERS, CONTROL CABINETS, AND OTHER SPECIALIZED EQUIPMENT PERTAINING TO MECHANICAL CONTROL. 3. THE ROOF MOUNTED UNITS (RTU) SHALL BE CONTROLED BY PROGRAMMABLE THERMOSTAT WITH REMOTE TEMPERATURE SENSORS. A. THE TEMPERATURE CONTROLS SHALL BE ELECTRONIC, 7 DAY PROGRAMMABLE WITH FUNCTION: AUTO, MANUAL, AND FAN ONLY, UNLESS SPECIFICALLY REQUESTED BY THE OWNER, AND SHALL BE PROVIDED BY THE CONTRACTED TEMPERATURE CONTROL CONTRACTOR. B. DEHUMIDIFICATION SYSTEMS SHALL BE CONTROLLED BY MANUFACTURER'S HUMIDISTAT. C. ALL CONTROL WIRING SHALL BE IN CONDUIT. CONDUIT SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE ELECTRICAL CONTRACTOR FOR LOCATION FOR CONDUITS. THE CONTRACTOR RESPONSIBLE TO INSTALL THE CONTROLS SHALL BE RESPONSIBLE TO PULL THE CONTROL WIRE. D. THE ROOF TOP UNIT SHALL UTILIZE TEMPERATURE CONTROL SYSTEM FURNISHED AS PART OF THE UNIT, OR SPECIFIED TO BE PROVIDED AS OPTIONS OR ACCESSORIES BY THE MANUFACTURER BY OF THE UNIT. ALL WIRING WILL BE DONE IN ACCORDANCE WITH APPROVED SHOP DRAWINGS FURNISHED BY THE MANUFACTURER. 4. ELECTRICAL WIRING: ALL WIRING AND STARTERS ARE INCLUDED IN THE ELECTRICAL DIVISION OF THIS PROJECT, BUT ALL CONTROLS, RELAYS, ETC., ARE INCLUDED UNDER THIS DIVISION. ROOM THERMOSTATS AND CONTROL SWITCHES SHALL BE LOCATED AS SHOWN OR DIRECTED, AND ALL CONTROLS, RELAYS, STARTERS AND WIRING SHALL CONFORM TO THE CURRENTLY ENFORCED VERSION OF THE NATIONAL ELECTRICAL CODE (NEC). ALL CONTROLS SHALL BE FURNISHED AND PROPERLY IDENTIFIED, WITH INSTRUCTIONS FOR PROPER ELECTRICAL CONNECTIONS. RESPONSIBILITY FOR PROPER CONNECTIONS AND OPERATION IS INCLUDED HEREIN.
15990 TESTING, ADJUSTING, AND BALANCING	1. THE MECHANICAL CONTRACTOR SHALL SUBCONTRACT AN AIR BALANCER TO BALANCE THE SYSTEMS DESCRIBED BELOW. 2. THE BALANCING SHALL BE COMPLETED BY AN INDEPENDENT AIR BALANCER WHO IS NOT AN EMPLOYEE OF THE MECHANICAL CONTRACTOR. 3. THE BALANCING SHALL BE DONE BY A QUALIFIED AIR BALANCER THAT HAS AT LEAST (3) YEARS OF DOCUMENTED AIR BALANCING EXPERIENCE. 4. PER COMPLIANCE WITH NCECC, THE BALANCER SHALL SUBMIT AN AIR BALANCE REPORT TO THE ENGINEER AND CITY INSPECTOR. 5. THE BALANCE REPORT SHALL SHOW PROOF THAT THE SYSTEM HAS BEEN BALANCED TO +/- 5% OF THE DESIGNED AIRFLOW. IT IS THE MECHANICAL CONTRACTOR AND AIR BALANCER'S DUTY TO PROVIDE ACCURATE DATA, SO AREAS OF INCORRECT FLOW MAY BE DISCLOSED TO THE ENGINEER, INSPECTOR, AND OWNER. 6. ALL AIRSIDE SYSTEMS, COMPONENTS, ETC. INCLUDING SUPPLY, RETURN, OUTDOOR, AND EXHAUST AIR SYSTEMS SHALL BE BALANCED. THE BALANCER SHALL PROVIDE SHEAVES AND BELTS AS NEEDED TO PROPERLY BALANCE EQUIPMENT TO +/- 5% OF THE DESIGNED AIRFLOWS. ALL DIFFUSERS, REGISTERS, GRILLES, AND LOUVERS SHALL BE INDIVIDUALLY BALANCED AND LISTED IN THE BALANCE REPORT. ALL AIRSIDE EQUIPMENT, SUPPLY, RETURN, AND OUTDOOR AIR FLOWRATES SHALL BE LISTED IN THE BALANCE REPORT.

rdc.

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PROFESSIONAL SEAL

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JOB NO.: 29894
DESIGNED BY: JBA

REVISIONS

△	ISSUE	DATE
	OTP	02/15/23
1	OTB SET	01/05/24

NORTH CAROLINA PROFESSIONAL SEAL 055196 ENGINEER JASON M. SCATES

Jan 04, 2024

PROFESSIONAL IN CHARGE
JMS

PROJECT MANAGER
SAG

QUALITY CONTROL
JMS

DRAWN BY
JBA

PROJECT NAME

CIRCLE K STORES, INC.

ANGIER, NC

9706 KENNEBEC CHURCH ROAD, ANGIER, NC 27501

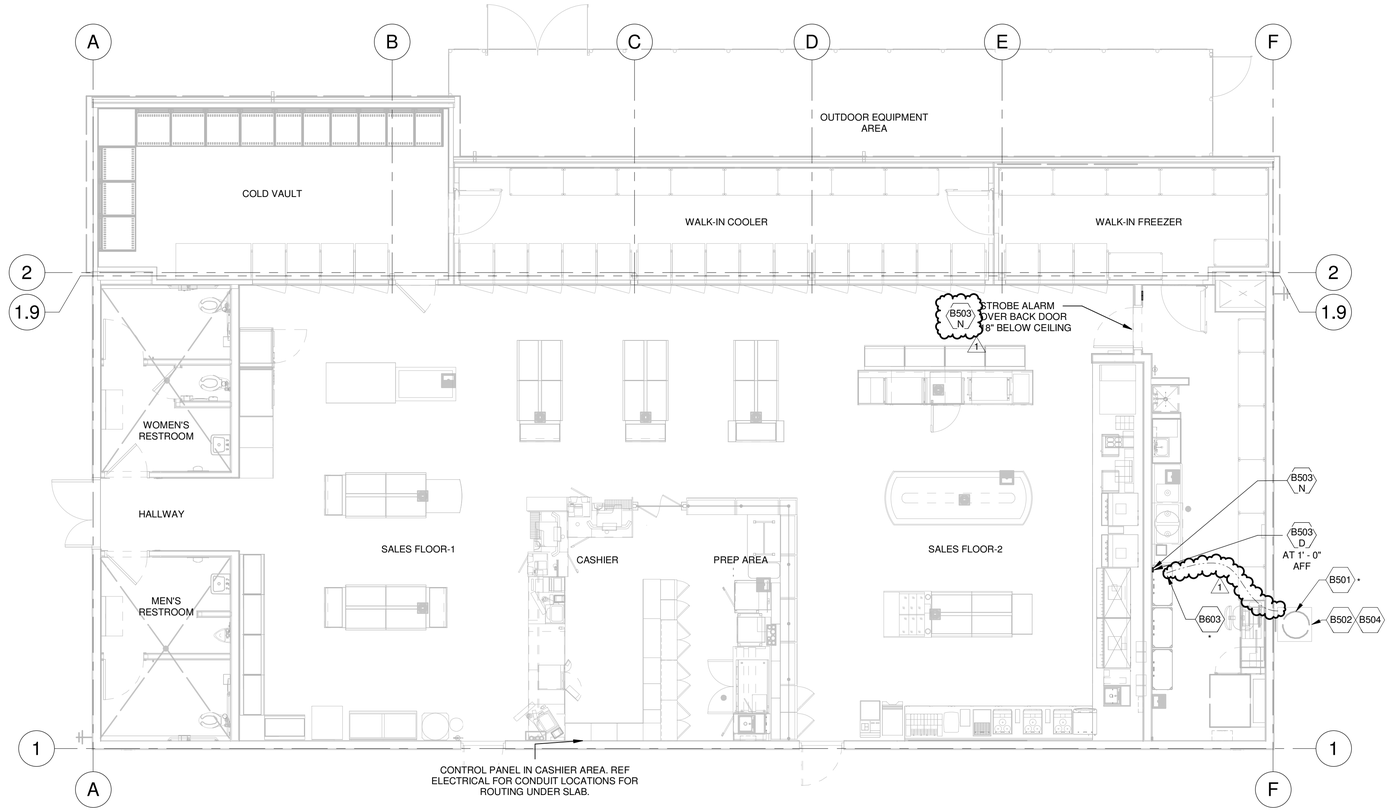
PROTOCYCLE# R1.2 12/XX/22

CIRCLE K STORE INC.

PROJECT NUMBER: 22130

MECHANICAL - SPECIFICATIONS

M1.3



CO2 LAYOUT PLAN (FOR REFERENCE ONLY) | 1

3/16" = 1'-0"

B603 - POINT OF USE (BAG IN THE BOX)

B501 - CO2 TANK

B503 D - DETECTION DEVICE

B503 N - NOTIFICATION DEVICE (REPEATER)

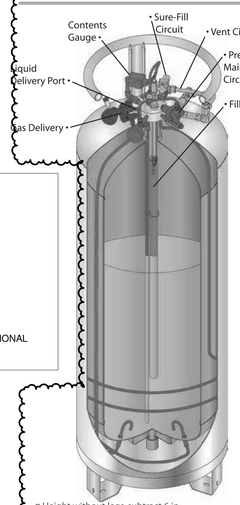
B504 - CO2 SIGN, SEE DETAIL 2/A9.1

B502 - CO2 TANK CABINET

NOTE: SEE ALSO SHEET A1.5 & A3.2 FOR ADDITIONAL INFORMATION

CARBO-MIZER® 450

HIGH CAPACITY BULK CO_2



Product Advantages:

- Proprietary vacuum regeneration system for convenient, on-site maintenance
- Safe, low operating pressure
- Easy-to-read gauges for contents and tank pressure
- Efficient gas withdrawal system supplies CO_2 gas up to 10 pounds per hour (4.5 kg)
- Fully automated system requiring no electricity
- Optional 6" (15.2 cm) welded uni-body legs
- Optional collection ring ensures quality CO_2 gas delivery

SPECIFICATIONS

Dimensions		
Diameter	20 in	50.8 cm
Height (with legs)¤	71.875 in	162.6 cm
Empty Weight	273 lb	123.8 kg
Full Weight	750 lb	340.2 kg
Design criteria		
Code	ASME*	
MAWP	300 psig	20.7 bar
Insulation Type	SI †	
Certifications*		
Capacity		
Gross Volume	52 gal	196.8 ltr
Net Storage Volume	48 gal	182 ltr
Storage Capacity at 125 psig	477 lb	216.4 kg
Performance		
Evaporation Rate §	2.5 lb/day	1.1 kg/day
CO_2 Gas Delivery (Continuous)#	5.5 lb/hr	2.5 kg/hr
Peak Flow Rate‡	10 lb/hr	4.5 kg/hr
Components		
ASME Relief Valve Setting	300 psig	20.7 bar
Secondary RV Setting	450 psig	31.0 bar
Gas Use Connection	1/4 in 45° Flare	
Fill Line Connection	5/8 in Male 45° Flare	
Vent Connection	1/2 in OD Tubing	
Construction		
Inner Vessel Material	Stainless Steel	
Outer Vessel Material	Stainless Steel	
Liquid Level Gauge°	Differential Pressure	

¤ Height without legs, subtract 6 in
* ASME Boiler and Pressure Vessel Design Section VIII, Div.1
† Super Insulation/High Vacuum
§ No loss in normal applications
# 12 consecutive hours at room temperature
‡ Four consecutive hours at room temperature
° Float gauge available upon request
* Meets NSF International Standards & European Union Regulation (EC) No 1935/2004

Your Local Representative

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P/N 12889441

ROYSTON®

CO2 CABINET

Royston's Outdoor CO2 Cabinet allows you to securely store your bulk CO2 tanks

SAFE AND SECURE STORAGE

Our attractive, aluminum CO2 Cabinet allows you to store and protect your bulk CO2 tanks in outdoor installations safely and securely. The cabinet features a lockable, piano-hinged door with key-only access for employees. Anchor points on all four legs allow secure attachment to concrete. Pre-punched penetrations for lines allow for easy access, and a louvered door and sides provide natural cross ventilation. The cabinet is finished in a neutral, exterior-grade powder coat paint but can be custom-colored to blend with any surrounding environment. For uninterrupted fountain drink service, keep your CO2 tanks properly protected.

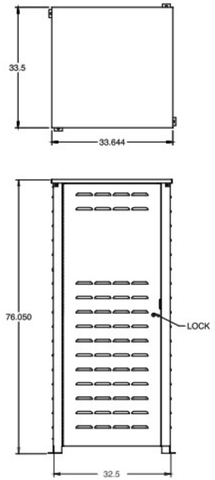
Royston quality, a one-year warranty and a 20- to 30-year life expectancy make this the go-to CO2 Cabinet nationwide.

STANDARD FEATURES

- Lockable door
- Full-length, stainless steel, piano-hinged door for easy access
- Anchor points at all four legs for secure installation
- Pre-punched penetrations for lines
- Louvered door and sides for natural cross ventilation
- Formed, pitched roof to allow for drainage

UPGRADES

- Custom color options include dark grey, black, blue, red or white to blend with surrounding environment



Keep Out: Lockable door

Simple Setup: Pre-punched penetrations for lines

Stays Steady: Points at all four legs for secure installation

Royston LLC One Pickroy Road Jasper, GA 30143 800.334.1766 770.735.3456 770.735.4017fax roystonllc.com

122216

NOTES

1. PRESSURED RELIEF DEVICES SHALL BE PIPED TO THE OUTDOORS WHERE THE DISCHARGE WILL NOT IMPINGE ON THE STRUCTURE, PERSONNEL, OR MEANS OF EGRESS AND WILL NOT CREATE A HAZARDOUS CONCENTRATION OF CARBON DIOXIDE. (NFPA 55, 13.1.1.2). THE TERMINATION OF THE PRESSURE RELIEF VENT DISCHARGE PIPING SHALL BE OUT DOORS AND A MINIMUM OF 10 FEET FROM THE OPENING INTO THE BUILDING.
2. CONTAINERS, CYLINDERS, AND TANKS SHALL BE PROVIDED WITH A PRESSURE GAUGE AND A LEVEL GAUGE OR DEVICE FOR INDICATING THE QUANTITY OF LIQUID CARBON DIOXIDE. (NFPA 55, 13.1.2.1)
3. ROOMS OR AREAS WHERE CONTAINER SYSTEMS ARE FILLED AND USED INDOORS OR IN ENCLOSED OUTDOOR LOCATIONS SHALL BE PROVIDED WITH A GAS DETECTION AND ALARM SYSTEM THAT IS CAPABLE OF DETECTING AND NOTIFYING THE BUILDING OCCUPANTS OF A GAS RELEASE THAT CREATES CARBON DIOXIDE VAPORS IN EXCESS OF ITS PEL. (NFPA 55, 13.2.2)
4. CARBON DIOXIDE GAS DETECTION SHALL BE AS FOLLOWS:
   A. PRE-ALARM (1500 PPM) NOTIFYING AY INCLUDE, BUT NOT LIMITED TO THE BUILDING OWNER, WORKING SUPERVISOR, OR MAINTENANCE COMPANY.
   B. ALARM (30,000 PPM) NOTIFICATION SHALL INCLUDE THE COMPLETE AREA, OR BUILDING EVACUATION AND ACTIVATION OF THE 911 SYSTEM, TO NOTIFY THE ANGIER FIRE DEPARTMENT OF A CARBON DIOXIDE GAS DETECTION ALARM. (PFD POLICY CARBON DIOXIDE 1.1)
5. CARBON DIOXIDE DETECTION SHALL BE LOCATED AT ALL POINTS OF USE LOCATIONS INSIDE THE BUILDING. (R3000.1)
   A. NOTE. THE DETECTION SHOULD BE PLACED AT A LEVEL ACCEPTABLE BASED ON THE PROPERTIES OF THE GAS (HEAVIER OR LIGHTER THAN AIR) 12-18 INCHES AFF OR BFC
6. ACTIVATION OF THE GAS DETECTION SYSTEM SHALL INITIATE AN AUDIBLE ALARM WITHIN THE ROOM OR AREA IN WHICH THE SYSTEM IS INSTALLED (NFPA 55, 13.2.2.1)
7. A WARNING SIGN SHALL BE POSTED AT THE ENTRANCE TO THE BUILDING, ROOM, ENCLOSURE, OR CONFINED AREA WHERE THE CONTAINER IS LOCATED. (NFPA 55, 13.2.3)
8. THE WARNING SIGN SHALL BE AT LEAST 8 IN. (200 MM) WIDE AND 6 IN. (150MM) HIGH AND STATE THE FOLLOWING:
   A. CAUTION: CARBON DIOXIDE GAS. VENTILATE THE AREA BEFORE ENTERING. A HIGH CARBON DIOXIDE (CO2) GAS CONCENTRATION IN THIS AREA CAN CAUSE SUFFOCATION. (NFPA 55, 13.2.3.1)
9. PROVIDE MINIMUM OF TWO NOTIFICATION DEVICES, ONE NEAR THE AREA/ROOM WHERE CYLINDER IS LOCATED, ON IN COMMON AREA WHERE THE PUBLIC GATHERS. DEVICES SHALL BE RATED AT 100 CD FOR VISUAL EFFECT AND 75 DB FOR AUDIBLE EFFECT UNLESS FULL FIRE ALARM IS PRESENT. (R3000.1)
   A. *NOTE - IF THE BUILDING IS EQUIPPED WITH A FIRE ALARM NOTIFICATION SYSTEM; THE USE OF THE SYSTEM IS ACCEPTABLE, PROVIDED THE GAS DETECTION HAS AUDIBLE AND VISIBLE CLEAR INDICATORS IN THE HAZARD AREA UPON BOTH THE WARNING LEVEL AND ALARM LEVEL OF THE GAS.
10. GAS DETECTION SYSTEM SHALL BE TIED INTO THE MONITORING SYSTEM IF PROVIDED (R3000.1)
11. PROVIDE LABEL ON PIPING TO INDICATE EXACT CONTENTS AND DIRECTION OF FLOW. THESE LABELS SHALL BE PLACED EVERY 20 FEET, MAJOR CHANGE IN DIRECTION AND WHERE PIPING ENTERS AND LEAVING WALLS.

LEGEND

•	SHUT OFF VALVE LOCATION
———	CO2 TANK TUBING

rdc.

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PROFESSIONAL SEAL

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PROJECT NAME

CIRCLE K STORES, INC.

ANGIER, NC

9706 KENNEBEC CHURCH ROAD, ANGIER, NC 27501

PROTOCYCLE# R1.2 12/XX/22

CIRCLE K STORE INC.

PROJECT NUMBER: 22130

CO2 LAYOUT PLAN AND NOTES

M1.4

NuCO2 BEVERAGE CARBONATION MADE EASY	Specifications for Phoenix, Arizona: Fill, Vent and Supply Line Materials for $NuCO_2$ Micro Bulk Tank Installations	Item ID #: PFD-01	Revision#: 3.0

1. **Purpose:** Provide the specification for the Fill, Vent and Supply Line Materials for Micro Bulk Tank Installations completed by $NuCO_2$ in Phoenix, AZ.
2. **Process Owner:** Director Product Engineering, CO_2 Solutions
3. **Responsibility:** PHX Service Technicians, PHX Supervisor, District 9 Manager, Safety, Engineering, Supply Chain.
4. **Part Specifications**

Gas Vent Line

Operating Conditions	Minimum Material Specification Requirements
PRD req'mnts for < 1000 lb capacity – 2 SCFM & backpressure ≤ 10% PRD set pressure: for 0.375" ID ≤ 100' backpressure < 15 psi (< 5% of 300 psig PRD)	Working Pressure: 120 psig minimum
Tested operating Temperatures and Pressures in Vent Line during Filling:	Burst Pressure Rating: 480 psig minimum (must be ≥ 4X Working Pressure)
Manual Vent-Fill: -30°F and 19 psig	Temperature Rating: -50°F to +125°F or higher
Semi-Fill Vent-Fill (Chart Industries) : -50°F and 120 psig	Inside Diameter = 0.370" nominal
	Outside Diameter = 0.500" nominal

NuCO2 BEVERAGE CARBONATION MADE EASY	Specifications for Phoenix, Arizona: Fill, Vent and Supply Line Materials for $NuCO_2$ Micro Bulk Tank Installations	Item ID #: PFD-01	Revision#: 3.0

Operating Conditions	Minimum Material Specification Requirements
Pressures during filling are between 150 and 300 psig	Working Pressure: 300 psig minimum
	Rated Burst Pressure: 1200 psig minimum (must be ≥ 4X Working Pressure)
Liquid temperatures during filling are between -24°F and +2°F	Temperature Rating: -40°F to +125°F or higher
	FDA 21 CFR 177 Food Compliant and NSF/ANSI Food Equipment Materials

$NuCO_2$ Specifications for Metallic Copper Vent and Fill Line :

- Material Specification: ASTM B280 Type ACR A (annealed) Copper Tube

Nominal Tube Size, Inches	Outside Diameter , inches	Inside Diameter, inches	Wall Thickness, inches	Calculated Minimum Burst Pressure, psi	Working Pressure, S=6000 psi 100°F
1/2	0.500	0.436	0.032	4097	727

NuCO2 BEVERAGE CARBONATION MADE EASY	Specifications for Phoenix, Arizona: Fill, Vent and Supply Line Materials for $NuCO_2$ Micro Bulk Tank Installations	Item ID #: PFD-01	Revision#: 3.0

Gas Supply Line

Operating Conditions	Minimum Material Specification Requirements
Micro Bulk Tank regulated outlet supply gas pressure requirements are between 99 psig for PepsiCo and 120 psig for Coca-Cola	Working Pressure: 120 psig minimum
	Burst Pressure Rating: 480 psig minimum (must be ≥ 4X Working Pressure)
	Temperature Rating: 0°F to +125 psig
Tested supply gas temperature from Micro Bulk Tank: +50°F to +53°F	ID/OD - 0.250"/0.420" and 0.375"/0.535" nominal
	FDA 21 CFR 177 Food Compliant and NSF/ANSI Food Equipment Materials
	Low permeability

$NuCO_2$ Specifications for *Non-Metallic* gas Supply Line material:

- *Working Pressure:* 125 psig minimum (requirements for Supply Pressure Regulator setting 98 psig for Pepsi and 120 psig Coca-Cola)
- *Burst Pressure Rating:* 500 psig minimum (4x Working)
- *Operating Temperature:* -10°F or lower to +125°F (Chart Industries testing demonstrates outlet gas temperature approximately -50°F)
- *ID/OD* = 0..250"/0.420" and 0.375"/0.535 nominal minimum
- *Color:* natural
- FDA 21 CFR 177 Food Compliant and NSF/ANSI 51 Food Equipment Materials
- Low permeability

NuCO2 BEVERAGE CARBONATION MADE EASY	Specifications for Phoenix, Arizona: Fill, Vent and Supply Line Materials for $NuCO_2$ Micro Bulk Tank Installations	Item ID #: PFD-01	Revision#: 3.0

$NuCO_2$ Non-Metallic CO2 gas beverage supply material example:

FLEX-TECH HOSE & TUBING, INC.

PEB FDA/NSF-51 POLYETHYLENE BEVERAGE HOSE

Hose is made from premium grade FDA and NSF listed materials. The combination of the EVA cover and the Polyethylene tube material have been carefully selected for low taste and odor properties, superior flexibility, clarity and high environmental stress cracking resistance.

Applications:

- Soft drink fountain machines for retail and commercial dispensing
- Other beverage dispensing to include but not limited to the following
  - Coffee and coffee related products, fruit juice, frozen drinks, tea.
- Fruit juice, ice tea, coffee and coffee related product dip
- Water service (potable) both carbonated and non-carbonated
- Dairy product dispensing machines

Construction:

- Tube: extruded from FDA approved (regulation 21 CFR 177.1520) and NSF-51 listed materials. Material has been scientifically selected for its low taste and odor properties, superior flexibility, clarity and high environmental stress cracking resistance.
- Reinforcement: Synthetic, high tensile cord for improved coupling retention, higher pressure ratings and longer lasting overall product integrity and durability.
- Cover: FDA approved (regulations 21 CFR 177.1350 and 175.105) Ethylene Vinyl Acetate (EVA) Copolymer specially formulated for clarity and added flexibility
- All materials used in the construction of this product are RoHS compliant.

Specifications:

Temperature Range:	-40°F (-40°C) to 150°F (65.5°C)
Standard Sizes:	1/4", 5/8", 1/2"
Rated Working Pressure:	See Table below (min 3:1 safety factor)
Packaging:	100' coils boxed or shrink wrapped in plastic and labeled, 300' or 500' bulk coils or cardboard spools (reversible boxed for redistribution upon request)

*Private brand labeling and tracer yarn color coding available – minimum order quantities may apply.

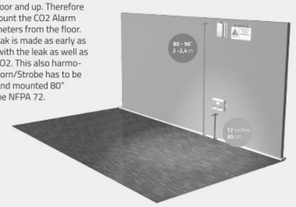
Item Number	Nom. I.D. (mm, O.D. (Max WLP, @ 70°F	Min. Burst	WT. Per Ft.	Standard Pkg Qty
PEB5OOD-00	1/4 0.420	300 PSI	400 PSI	500 ft boxed or shrink
PEB 5OOD-00	3/8 0.535	300 PSI	400 PSI	300 ft boxed or shrink

LOGICO2

CO2 Alarm Sensor Mk9
Quick Guide

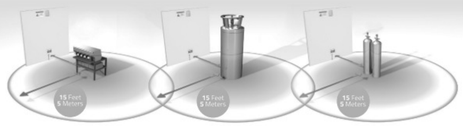
Installation Height

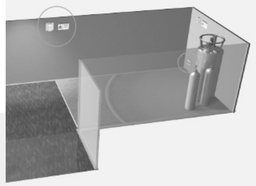
CO2 is a heavy gas that accumulates in the lowest areas filling an area from the floor and up. Therefore it is our recommendation to mount the CO2 Alarm Sensor at 12 inches /30 centimeters from the floor. This way the awareness of a leak is made as early as possible insuring time to deal with the leak as well as avoiding unnecessary loss of CO2. This also harmonizes with existing code. The Horn/Strobe has to be able to be seen by everybody and mounted 80" to 96" above the floor as per the NFPA 72.



CO2 detection distance

The CO2 Alarm Sensor must be mounted within a 5 meter/ 15 feet radius of the CO2 distribution point. If a specific distribution point cannot be defined, install the sensor in the most appropriate location to cover a 78 square meter / 840 square foot area to be monitored.



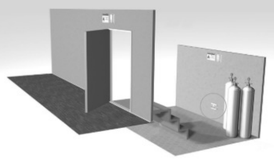


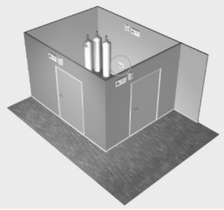
Corridors

In areas were the CO2 is stored in the end of a corridor, it is paramount to place an extra Horn Strobe at the entrance of the corridor. This to give early warning in case of a CO2 leakage.

Lower floor/basement

In areas where the CO2 is stored or distributed in Below Grade locations such as Lower Floors and Basements, it is essential to have Horn Strobes before the entrance to the area.

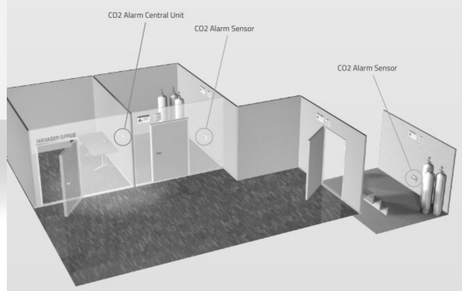




Enclosed Spaces

In enclosed spaces Horn Strobes must be placed outside of each entrance.

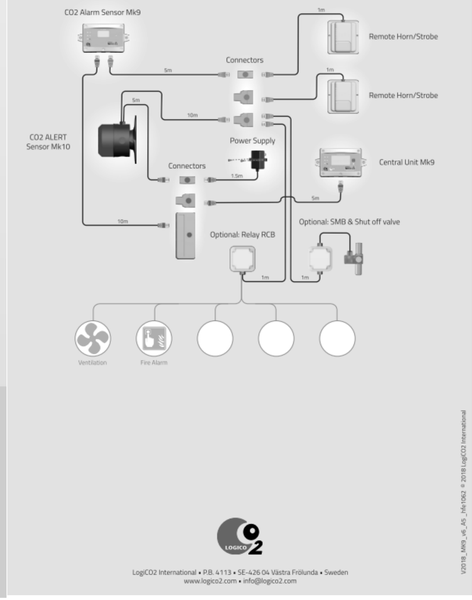
System Installation



Altitude adjustment

Important! For the CO2 sensors to give accurate measurements, do not forget to adjust the altitude compensation on the CO2 sensors to the closest higher altitude value for the location. This easy procedure is covered in the manual.

Installation Schematics:



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FOR INFORMATION ONLY

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	OTP	02/15/23
1	OTB SET	01/05/24

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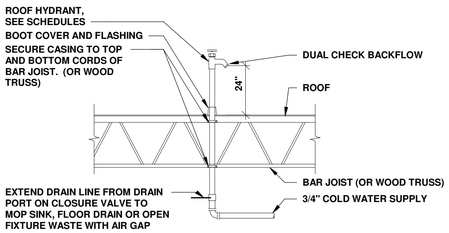
CO2 CUT SHEETS

M1.5

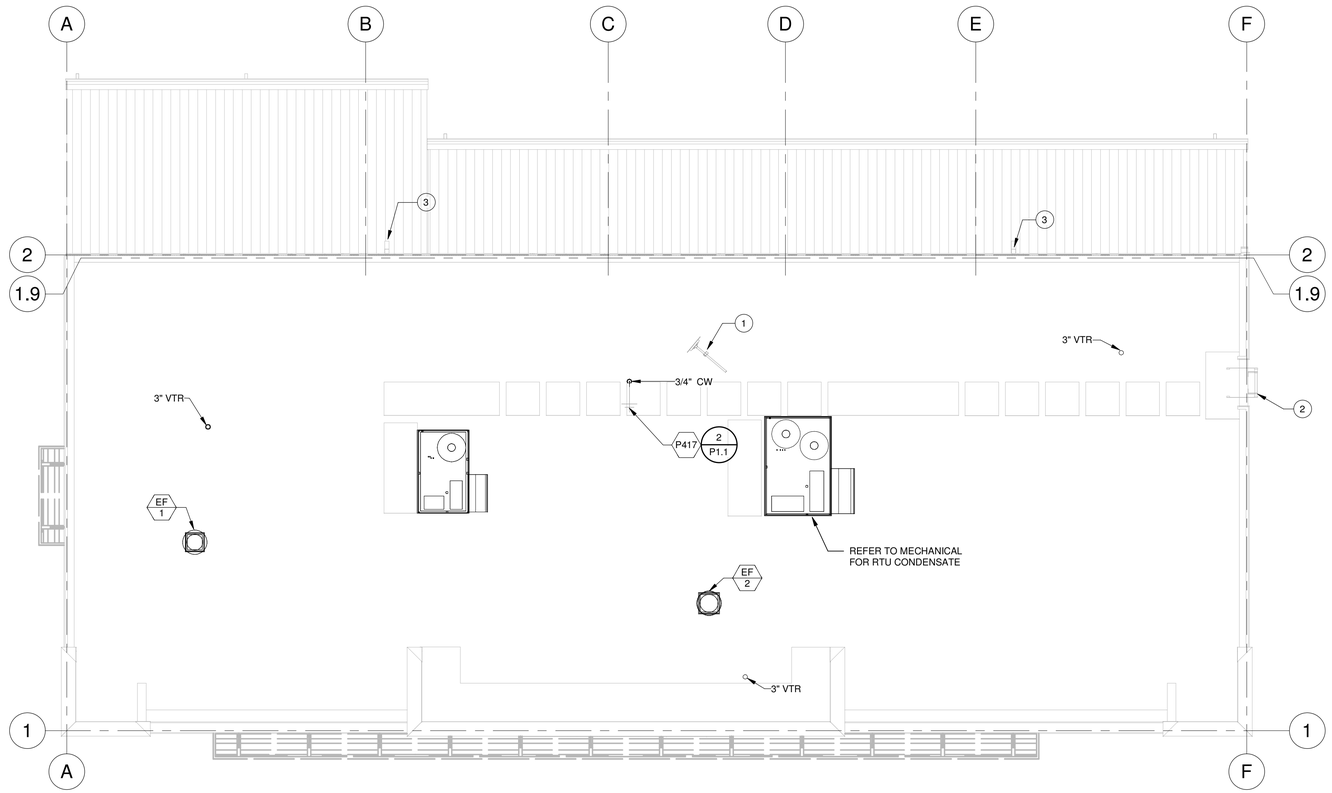


FREEZELESS ROOF HYDRANT | 2
N.T.S.

ROOF DRAIN CALCULATIONS

0.0104 = CONVERSION FACTOR - GPM/SQFT FOR 1"/HR RAINFALL.

AREA NAME	AREA (A1)	PARAPET AREA	1/2 PARAPET WALL AREA (A2)	RAIN FALL RATE (R IN INCHES)	GPM=0.0104 x R x (A1+A2), [EQ 11-1 IPC 1106.2.1]	2018 NORTH CAROLINA PLUMBING CODE: MINIMUM VERTICAL PRIMARY DRAIN SIZE PER TABLE 1106.3
LEFT ROOF	1978 ft²	334 ft²	167 ft²	3.75	84	3"
RIGHT ROOF	1859 ft²	351 ft²	176 ft²	3.75	79	3"
	3838 ft²		343 ft²			



PLUMBING ROOF PLAN | 1
3/16" = 1'-0"

KEYNOTES

1 SATELLITE DISH LOCATION. REFERENCE THE ARCH ROOF PLAN FOR EXACT LOCATION.
2 EXTERIOR ROOF ACCESS SHOWN FOR REFERENCE ONLY. REFER TO ARCHITECTURAL DRAWINGS FOR MORE INFORMATION.
3 ROOF DRAINAGE WITH 4" LEADER. SEE DETAIL 9/A8.3. REFER TO ROOF DRAIN CALCULATION FOR SIZING INFO.

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NORTH CAROLINA PROFESSIONAL SEAL 055196 ENGINEER JASON M. SCATES

Jan 04, 2024

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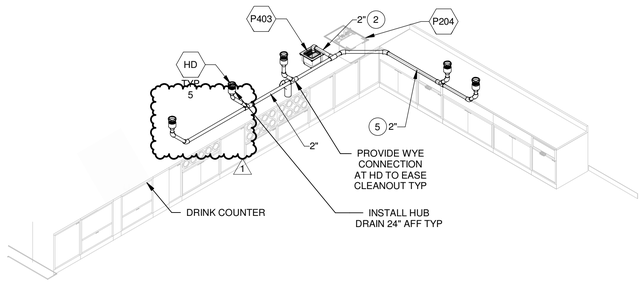
PLUMBING - ROOF PLAN

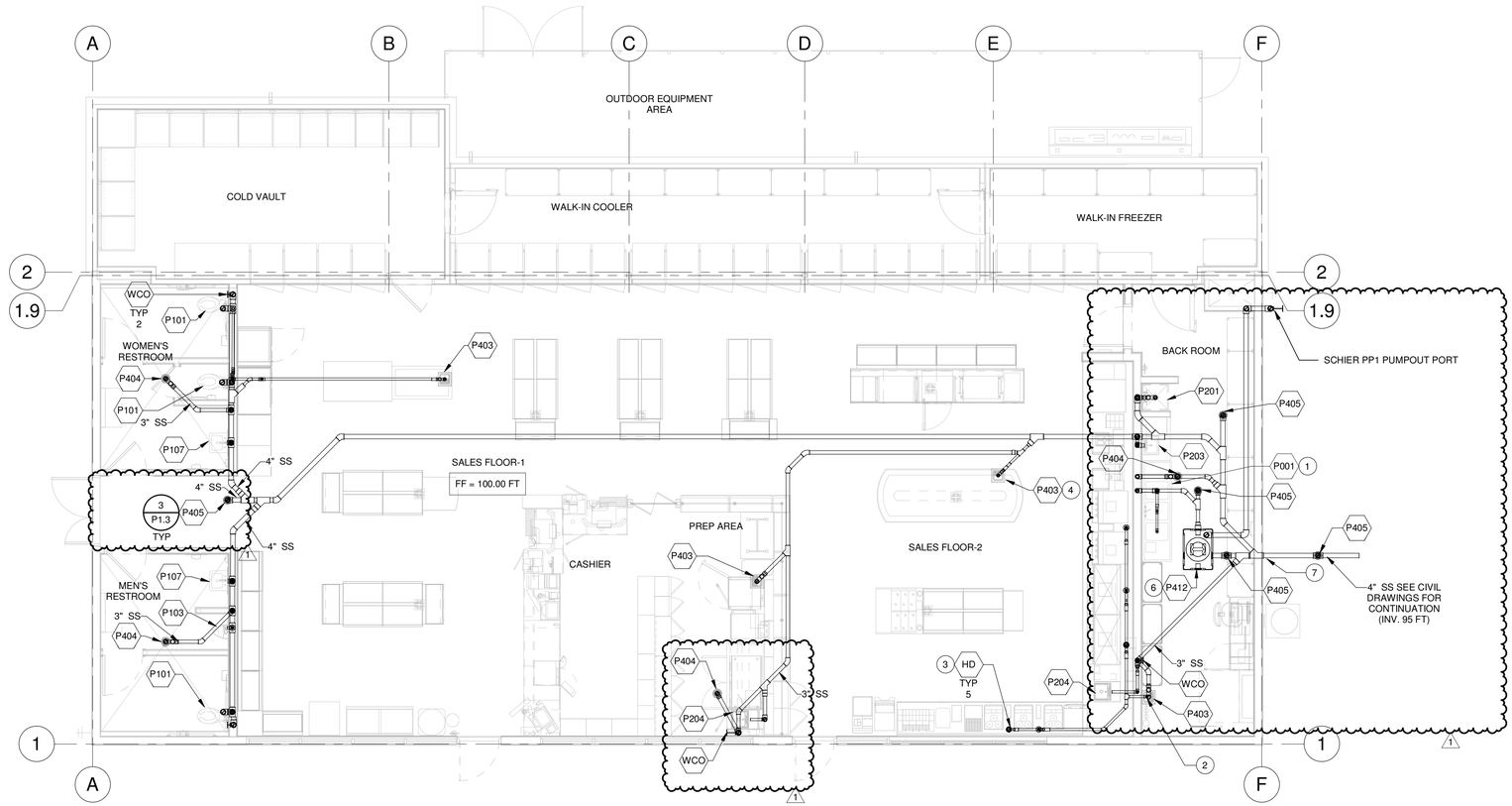
P1.1

KEYNOTES

1. PROVIDE 3-COMPARTMENT SINK WITH DIRECT CONNECT DRAIN LINES AND ROUTE TO GREASE INTERCEPTOR BELOW GRADE.
2. AIR GAP TO BE TWICE THE EFFECTIVE OPENING OF THE INDIRECT WASTE PIPE.
3. REFER TO DETAIL 2/P1.1.1 FOR TYPICAL HUB DRAIN INSTALLATION.
4. FLOOR SINK TO BE MINIMUM 50% EXPOSED WITHOUT HAVING TO MOVE ANY EQUIPMENT AND OPEN CABINETS TO GAIN ACCESS.
5. DRAIN EQUIPMENT INDIRECTLY TO THE NEAREST FLOOR SINK UNDER CABINET. AIR GAP TO BE TWICE THE EFFECTIVE OPENING. TYPICAL FOR ALL BEVERAGE EQUIPMENT. DRAIN LINE TO MAINTAIN A MINIMUM SLOPE 2% FROM EQUIPMENT TO FLOOR SINK.
6. PROVIDE MANUFACTURERS RISERS AS REQUIRED FOR BELOW GRADE INSTALLATION. PROVIDE MANUFACTURER'S PUMP-OUT PORT KIT WITH 2" PIPING TO EXTERIOR WALL.
7. CONTRACTOR TO COORDINATE UNDERGROUND SEWER PIPING WITH WALL FOOTING.



HUB DRAIN DETAIL | 2
N.T.S.



PLUMBING FLOOR PLAN - WASTE AND VENT | 1
3/16" = 1'-0"

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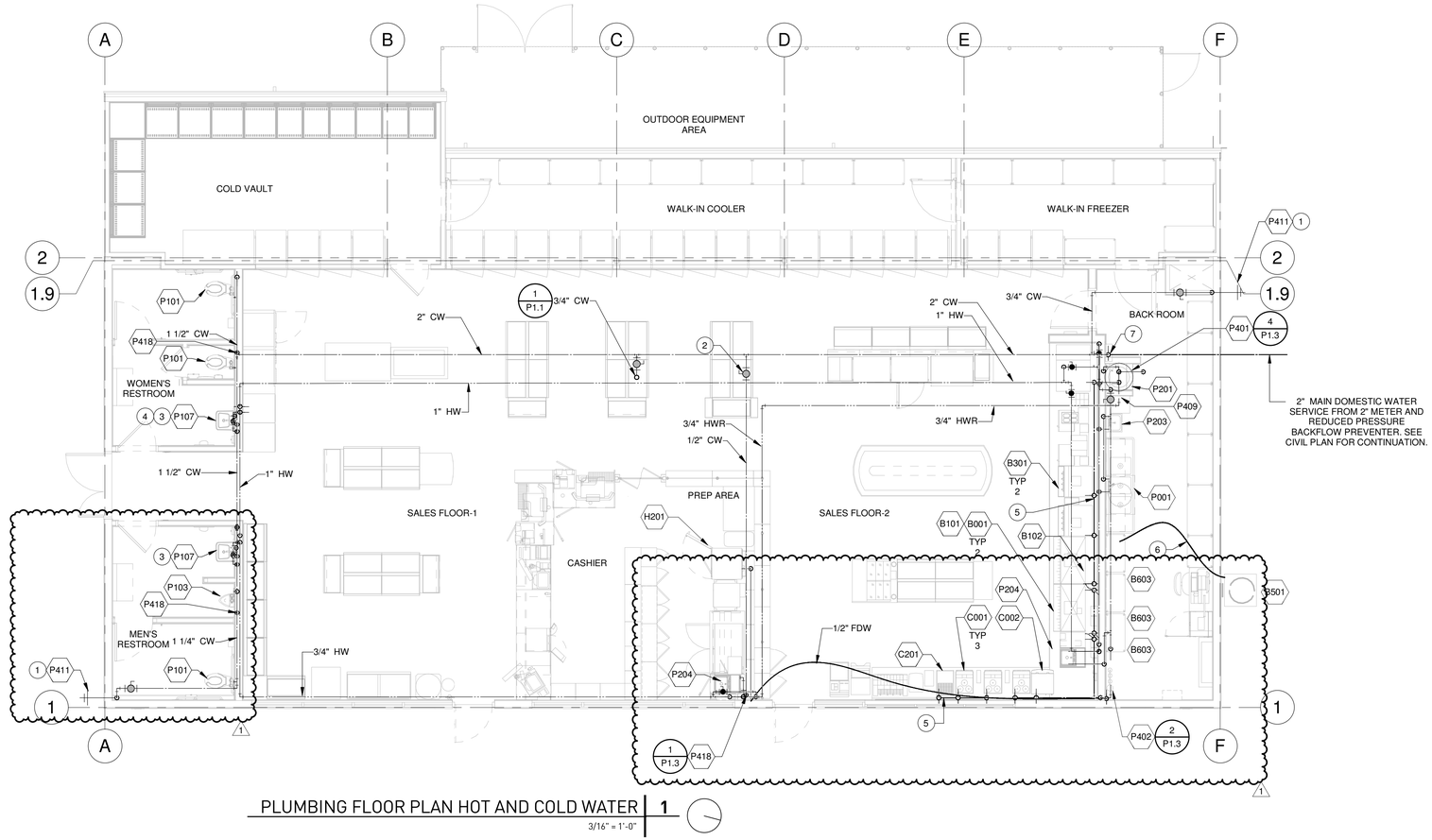
PLUMBING FLOOR PLAN - WASTE AND VENT

P1.1.1



PLUMBING FLOOR PLAN HOT AND COLD WATER | 1

3/16" = 1'-0"

KEYNOTES

1. 3/4" CW DOWN IN WALL/EXPOSED TO HB SHALL BE PROVIDED WITH HEAT TAPE AND INSULATION.
2. SHUT-OFF (BALL VALVE) ABOVE CEILING. PROVIDE ACCESS (TYPICAL).
3. THE HEATED WATER SUPPLY PIPING SHALL BE ROUTED TO WITHIN THE LENGTH SPECIFIED FROM THE HEATED WATER SOURCE IN ACCORDANCE WITH THE IECC CH. C404.5.1.
4. PROVIDE TMV PER AHJ REQUIREMENTS, TYP.
5. ROUTE FILTER WATER LINES DOWN WALL AND OVER HORIZONTALLY UNDER CABINET.
6. CO2 LINE TO RUN UP WALL THEN OVERHEAD TO CONNECT TO CARBONATORS. INSTALL PER MANUFACTURERS' INSTALLATION INSTRUCTIONS.
7. MAIN WATER SUPPLY LINE UP IN WALL TO ABOVE CEILING. COORDINATE EXACT LOCATION.

PLUMBING SYMBOLS

SS	SANITARY SEWER
GW	GREASE WASTE
OW	OIL WASTE
ST	STORM SEWER
RD	ROOF DRAIN LINE
ORD	OVERFLOW ROOF DRAIN LINE
–	DOMESTIC COLD WATER
– –	DOMESTIC HOT WATER
– – –	DOMESTIC HOT WATER RETURN
IW	IRRIGATION WATER
T	110°F TEMPERED WATER
FDW	FILTERED + DESCALED WATER
FW	FILTERED WATER
G	NATURAL GAS
A	COMPRESSED AIR
CD	CONDENSATE DRAIN
RO	REVERSE OSMOSIS WATER
V	PLUMBING VENT
VAC	PLUMBING VACUUM
	UNION
	GAS PRESSURE REGULATOR
	GAS COCK
	ELBOW - TURNED DOWN
	ELBOW - TURNED UP
	TEE - TURNED DOWN
	TEE - TURNED UP
BV	BALL VALVE (BV)
BNC	BYPASS NORMALLY CLOSED (BNC)
	PLUG VALVE
	CHECK VALVE
	SHUT-OFF VALVE IN VERTICAL LINE
	BACKFLOW PREVENTER
M	WATER METER
WHA	WATER HAMMER ARRESTOR
	THERMOMETER
	T & P RELIEF VALVE
TMV	THERMOSTATIC MIXING VALVE
FD	FLOOR DRAIN
RD	ROOF DRAIN/OVERFLOW ROOF DRAIN
FS	FLOOR SINK
FCO	FLOOR CLEANOUT
YCO	YARD CLEANOUT
FPWH	FREEZE PROOF WALL HYDRANT
HB	HOSE BIBB
WCO	WALL CLEANOUT
	CONNECT TO EXISTING
ETR	EXISTING TO REMAIN
UNO	UNLESS NOTED OTHERWISE
WHA	WATER HAMMER ARRESTOR
VBF	VENT BELOW FLOOR
?	KEYNOTE CALLOUT SYMBOL (? = NUMBER)
?	PLUMBING FIXTURE CALLOUT SYMBOL

GENERAL NOTES

IF POST MIX IS INSTALLED A STAINLESS R.P.B.A. MUST BE USED OR WILKINS 375X1 WITH NO COPPER INSTALLED DOWNSTREAM OF R.P.B.A.

rdc.

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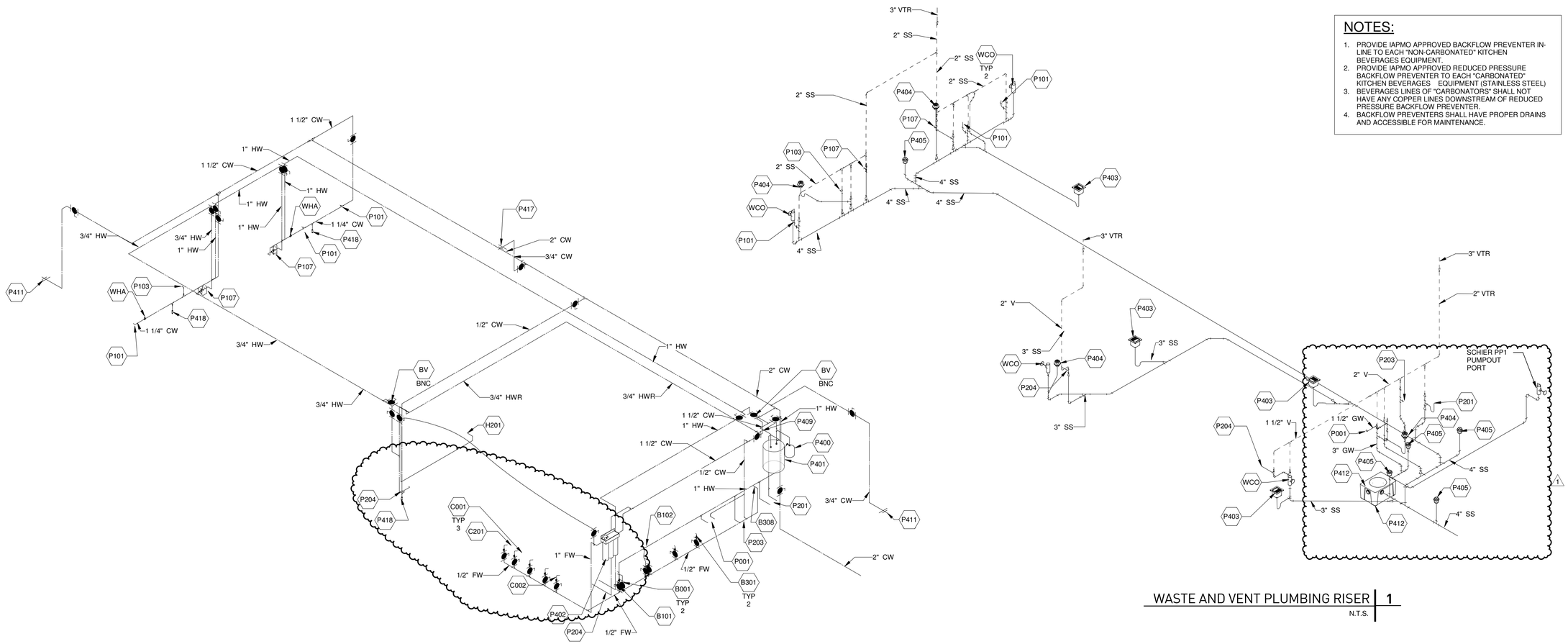
PLUMBING FLOOR PLAN-DOMESTIC WATER

P1.1.2

NOTES:

1. PROVIDE IAPMO APPROVED BACKFLOW PREVENTER IN-LINE TO EACH "NON-CARBONATED" KITCHEN BEVERAGES EQUIPMENT.
2. PROVIDE IAPMO APPROVED REDUCED PRESSURE BACKFLOW PREVENTER TO EACH "CARBONATED" KITCHEN BEVERAGES EQUIPMENT (STAINLESS STEEL)
3. BEVERAGES LINES OF "CARBONATORS" SHALL NOT HAVE ANY COPPER LINES DOWNSTREAM OF REDUCED PRESSURE BACKFLOW PREVENTER.
4. BACKFLOW PREVENTERS SHALL HAVE PROPER DRAINS AND ACCESSIBLE FOR MAINTENANCE.



WASTE AND VENT PLUMBING RISER | 1
N.T.S.

HOT AND COLD WATER RISER | 2
N.T.S.

SITE LOCATION:	**ANGIER, NC - KENNEBEC CHURCH RD. AND FALCON CREST CIR.**
STATIC PRESSURE:	**59 PSI AS PER TEST TAKEN ON 06/15/2022**
TOTAL WATER SUPPLY FIXTURE UNIT:	**77.50 (PREDOMINANTLY FLUSH VALVES) PER 2018 NCPC**
GPM:	**61.2**
WATER MAIN:	**2" (VERIFY WITH WATER COMPANY)**
	59.0 PSI (PRESSURE IN MAIN) **-8.3 PSI (LOSS THROUGH 2" METER)** **-2 PSI (LOSS THROUGH TAP)** **-25 PSI (FIXTURE LOSS AT END, FLUSH VALVE)** **-7 PSI (14 DROP FOR ELEVATION, 0.5 PSI LOSS PER FT)** **-12 PSI (BACKFLOW PREVENTER)** **4.7 PSI (AVAILABLE PRESSURE)**
	PIPE LENGTH (TAP TO METER) 18 FT **PIPE LENGTH (METER TO BUILDING) 263 FT** **PIPE LENGTH (BUILDING TO LAST FIXTURE) 93 FT** **VERTICAL LENGTH 14 FT** **EQUIVALENT LENGTH OF FITTINGS 45 FT** **TOTAL DEVELOPED LENGTH 433 FT**
MAX ALLOWABLE LOSS (PER 100 FT OF PIPE):	**PRESSURE AVAILABLE 4.70 X 100 = 1.08 PSI/100 FT** **TOTAL LENGTH 433**

WATER SUPPLY CALCULATION | 3
N.T.S.

2 MINUTE DRAIN TIME →

GREASE INTERCEPTOR CALCULATIONS

TAG	DESCRIPTION	DRAINAGE PER	COUNT	LOADING FACTOR	GPM
P001	3-COMPARTMENT SINK W/ (2) 18" DRAIN BOARDS	50	1	1	25
Grand total			1		25

GREASE INTERCEPTOR PROVIDED = 50 GPM / 272.7 LBS GREASE HOLDING CAPACITY

PLUMBING LOADS

TAG	DESCRIPTION	CWFU	HWFU	DRAINAGE PER (DFU)	COUNT	CW TOTAL (CWFU)	HW TOTAL (HWFU)	DRAINAGE TOTAL (DFU)	TOTAL WATER (WSFU)
P001	3-COMPARTMENT SINK W/ (2) 18" DRAIN BOARDS	3	3	50	1	3	3	50	6
P101	TOILET	10	0	10	3	30	0	30	30
P103	URINAL	10	0	4	1	10	0	4	10
P107	WALL MOUNTED HAND SINK	2.25	2.25	2	2	4.5	4.5	4	9
P201	MOP SERVICE SINK	3	3	2	1	3	3	2	6
P203	WALL MOUNTED HAND SINK	2.25	2.25	2	1	2.25	2.25	2	4.5
P204	DROP-IN HAND SINK	2.25	2.25	3	2	4.5	4.5	6	9
P402	WATER FILTER				1	0	0	0	0
P403	FLOOR SINK	0	0	0.5	4	0	0	2	0
P404	FLOOR DRAIN WITH TRAP PRIMER	0	0	4	4	0	0	16	0
P411	HOSE BIBB	1	0	0	2	2	0	0	2
P417	FREEZELESS ROOF HYDRANT	1	0	0	1	1	0	0	1
Grand total					23	60.25	17.25	116	77.5

1

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JMS

PROJECT MANAGER
SAG

QUALITY CONTROL
JMS

DRAWN BY
JBA

PROJECT NAME

CIRCLE K STORES, INC.

ANGIER, NC

9706 KENNEBEC CHURCH ROAD,
ANGIER, NC 27501

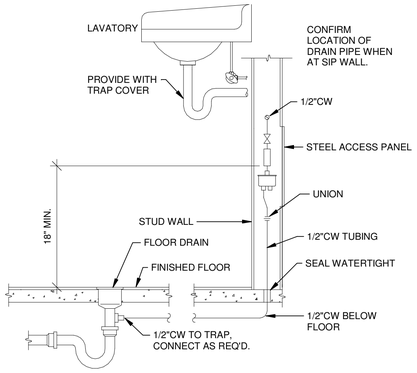
PROTOCYCLE# R1.2 12/XX/22

CIRCLE K STORE INC.

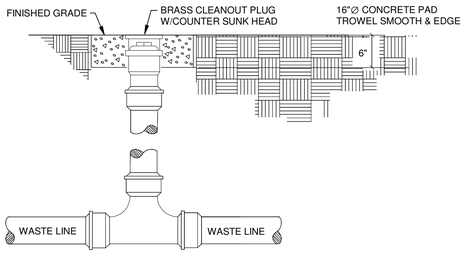
PROJECT NUMBER: 22130

PLUMBING RISERS

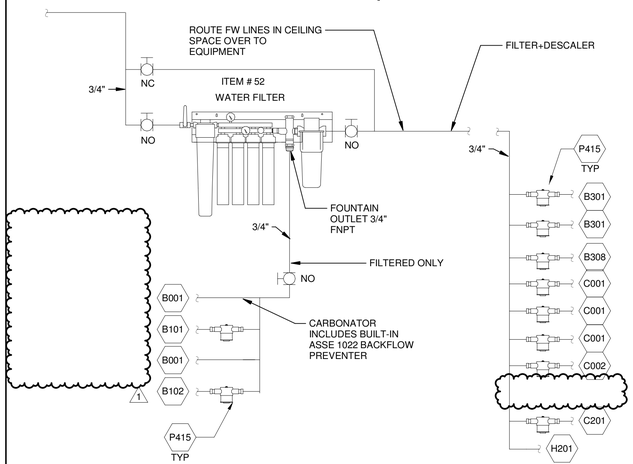
P1.2



TRAP PRIMER ASSEMBLY | 1
N.T.S.

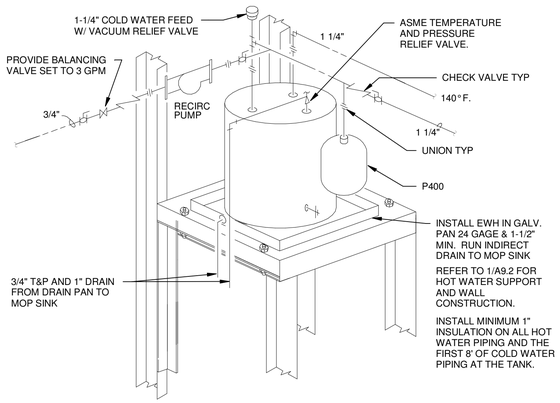


2-WAY CLEANOUT DIAGRAM | 3
N.T.S.



NO - NORMALLY OPEN
NC - NORMALLY CLOSED

EVERPURE WATER FILTER SYSTEM | 2
N.T.S.



REFER TO DETAIL 1 ON A9.2. IN THE ARCHITECTURAL DWG. FOR WATER HEATER SHELF DETAIL.

WALL MOUNTED ELECTRIC WATER HEATER | 4
N.T.S.

GENERAL NOTES

A. FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, FEES, PERMITS, CERTIFICATE OF INSPECTION, ETC. NECESSARY OR REASONABLE, REQUIRED FOR THE COMPLETE INSTALLATION OF ALL PLUMBING WORK.
B. WORK SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL CODES, LAWS, ACTS, ORDINANCES, REGULATIONS AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
C. THE COMPLETED INSTALLATION SHALL BE IN ACCORDANCE WITH ALL THE APPLICABLE INDUSTRY STANDARDS OF GOOD PRACTICE, SAFETY, AND THE MANUFACTURERS STRICTEST RECOMMENDATIONS FOR EQUIPMENT AND PRODUCT APPLICATION AND INSTALLATION.
D. THESE DRAWINGS ARE DIAGRAMMATIC ONLY. CONTRACTOR SHALL MAKE MODIFICATIONS INCLUDING OFFSETS, TURNS, AND RE-ROUTING REQUIRED TO COMPLETE THE INSTALLATION. DO NOT SCALE LOCATION OF EQUIPMENT OR PIPING.
E. COORDINATE ALL PLUMBING WORK, INCLUDING EQUIPMENT AND PIPING, WITH OTHER TRADES PRIOR TO WORK.
F. CONTRACTOR TO VERIFY LOCATION OF ALL EXISTING EQUIPMENT SO THAT NO INTERFERENCES ARE ENCOUNTERED WITH OTHER EQUIPMENT OR WITH STRUCTURAL ELEMENTS.
G. ALL PLUMBING WORK IS TO RUN IN A NEAT AND PROFESSIONAL MANNER, WITH THE AESTHETICS OF THE FACILITY OF PARAMOUNT IMPORTANCE. ALL ROUGH-IN WORK TO BE HIDDEN WITHIN WALLS AND ABOVE CEILING UNLESS OTHERWISE NOTED.
H. ALL WORK SHALL BE LOCATED TO AVOID CONFLICTS WITH OTHER TRADES. CLOSELY COORDINATE ALL WORK WITH ALL OTHER TRADES. FAILURE OF THE CONTRACTOR TO COORDINATE WITH ALL OTHER TRADES SHALL RELIEVE THE OWNER FROM ANY ADDED COSTS.
I. THE CONTRACTOR SHALL DO ALL NECESSARY CUTTING OF WALLS AND CEILING. PATCH AROUND ALL OPENINGS TO MATCH EXISTING CONSTRUCTION. NO STRUCTURAL MEMBER SHALL BE CUT WITHOUT PERMISSION FROM THE ENGINEER.
J. VENT SIZES NOT SHOWN IN THE PLAN VIEW OR RISER VIEW SHALL BE 1 1/2".
K. EXACT LOCATION OF PLUMBING FIXTURES SHALL BE DETERMINED FROM ARCHITECTURAL DRAWINGS.CONTRACTOR SHALL VERIFY INVERT ELEVATIONS OF SEWERS TO WHICH NEW WASTE LINES ARE TO BE CONNECTED BEFORE MAKING UP OR INSTALLATION OF NEW WASTE SYSTEM.

PLUMBING FIXTURE SCHEDULE

TAG	DESCRIPTION	MFG.	MODEL	ROUGH-IN SIZE CW	HW	FW	SAN	COUNT	TRIM/REMARKS
B001	FOUNTAIN DRINK DISPENSER	CORNELIUS	ED-300	0"	0"	1/2"	3/4"	2	
B101	ICE MAKER	FOLLETT	HCD1810RHT	0"	0"	3/8"	0"	1	19" FOLLETT REMOTE CHEWBLET
B102	1 FOUNTAIN AND/OR BAGGER	MANITOWOC	IYF-1800C-161	0"	0"	3/8"	3/4"	1	30" MANITOWOC REMOTE ICE MAKER (1825LB)
B301	FOUR BARREL COUNTERTOP FCB	CORNELIUS	VIPER ELITE-4B	0"	0"	1/2"	0"	2	
B308	F'REAL BLENDER AND BLENDING BAR FREEZER	F'REAL	B6	0"	0"	1/2"	3/4"	1	
B603	3 WIDE BIB RACK PACKAGE	CORNELIUS	3BIFJ	0"	0"	0"	0"	3	
C001	3-HOPPER BEAN TO CUP BREWER	SCHAERER	040381-00058 EUS	0"	0"	0"	0"	3	
C002	5-HD CAPPUCCINO	WILBURT CURTIS	PCGT5	0"	0"	0"	0"	1	
C201	SMALL COUNTERTOP ICE MAKER	FOLLETT	15CI00A-NW-NF-ST-RD	0"	0"	0"	1/2"	1	
H201	ELECTRIC COMBI OVEN	UNOX	XAVC-0511-EPR	0"	0"	0"	1 1/4"	1	OVEN REQUIRES FILTERED AND DESCALED WATER.
HD	PVC HUB DRAIN	---	---					5	SIZING PER P1.1.1
P001	3-COMPARTMENT SINK W/ (2) 18" DRAIN BOARDS	ADVANCE TABCO	9-3-54-18RL	1/2"	1/2"	0"	2"	1	GC TO SUPPLY AND INSTALL SINK
P101	TOILET	AMERICAN STANDARD	3043.001	1"			4"	3	VALVE, SLOAN 111 ESS-1.25-TMO-HW - WATER CONSERVATION 1.28 GALLONS PER FLUSH. OPEN FRONT SEAT - OLSONITE #10CC.
P103	URINAL	AMERICAN STANDARD	6590.001	3/4"			2"	1	URINAL FLUSH VALVE SLONE 186-ESS-0.5-TMO-HW AUTOMATIC HARD WIRED. WALL BRACKET SUPPORT SET AT ELEV. TO MEET ADA
P107	WALL MOUNTED HAND SINK	KOHLER	K-2005	1/2"	1/2"	0"	1"	2	FAUCET: TOTO TEL3LS-10 - 0.5 GPM SENSOR OPERATED SELF-GENERATING POWER SYSTEM, STANDARD SPOUT, 4" COVER PLATE, GRID STRAINER WITH TAILPIECE, P-TRAP WITH CLEANOUT, STOP VALVES, SS BRAIDED WATER SUPPLIES AND ESCUTCHEONS. CARRIER: JOSAM 17100, WADE W-520. LAVATORY ENCLOSURE: TRUEBRO LAV-SHIELD 2018, PROVIDE P408, ASSE 1070 TMV SET TO 110F.
P201	MOP SERVICE SINK	MUSTEE	63M	3/4"	3/4"		3"	1	AMERICAN STANDARD #8344.111 WALL MOUNT FAUCET TOP BRACE, VACUUM BREAK, STOPS
P203	WALL MOUNTED HAND SINK	ADVANCE TABCO	7-PS-60	1/2"	1/2"	0"	1 1/2"	1	PROVIDE P408, ASSE 1070 TMV SET TO 110F.
P204	DROP-IN HAND SINK	ELKAY OR EQUAL	K11515	1/2"	1/2"	0"	2"	2	FAUCET BY G.C. CHROME STOPS 1/4 TURN SUPPLIES AND P-TRAP. PROVIDE P408, ASSE 1070 TMV SET TO 110F..
P400	FIXED BLADDER TYPE EXPANSION TANK.	AMTROL FLEXCON WATTS WILKINS	ST-12 WH-18 PLT-12 XT-18	0"				1	4.4 GALLON MINIMUM TOTAL CAPACITY, FACTORY STANDARD PRECHARGE CAPACITY.
P401	ELECTRIC WATER HEATER	A.O. SMITH	DRE-52-24	1 1/4"	1 1/4"			1	3/4" P & T RELIEF VALVE. 52 GAL STORAGE. ELECTRICAL, 24 KW, 208V, 3PH.
P402	WATER FILTER	EVERPURE	EV9437-10	3/4"		3/4"	3/4"	1	
P403	FLOOR SINK	ZURN	Z1901					4	1/2 GRATE WITH 12"X12" (6" DEEP) PORCELAIN SEDIMENT BUCKET
P404	FLOOR DRAIN WITH TRAP PRIMER	WADE	1000-S-TD6.1					4	SATIN STRAINER
P405	FLOOR CLEANOUT	J.R. SMITH	4100 SERIES					5	ADJUSTABLE FLOOR CLEANOUT, 5 IN ROUND NICKEL BRONZE TOP, 4 IN PIPE, GAS TIGHT GASKETED BRASS PLUG, NO HUB OUTLET, MD LOAD RATING.
P406	DUAL CHECK VALVE ATMOSPHERIC PORT & STRAINER	WATTS	SD-3	3/8"				10	STAINLESS STEEL BODY CONSTRUCTION WITH INTERNAL RUBBER COMPONENTS AND IS DESIGNED FOR CONTINUOUS OR INTERMITTENT PRESSURE APPLICATIONS. WITH A WYE PATTERN STRAINER. MAXIMUM WORKING PRESSURE: 150PSI (10 BAR)
1 P408	THERMOSTATIC MIXING VALVE	ZURN	ZW3870XLTF	0"	0"			4	PROVIDE ASSE 1070 CERTIFIED MIXING VALVE SET TO 110°F AT ALL HAND SINKS PER AHJ
P409	RECIRCULATION PUMP	TACO	T003-BC4	3/4"	0"	0"	0"	1	HP: 1/40 - CONNECTION SIZES: 3/4" SWEAT.
P411	HOSE BIBB	MIFAB	MHY-35	3/4"				2	ANTI-SIPHON VACUUM BREAKER PROTECTED. VANDAL RESISTANT VACUUM BREAKER.
P412	HYDROMECHANICAL GREASE INTERCEPTOR.	SCHIER	GB3					1	PROVIDE MFR'S FCR1 FIELD CUT RISERS AS REQUIRED FOR BELOW GRADE FIELD INSTALL. INTERCEPTOR DESIGN AND INSTALLATION SHALL COMPLY WITH LOCAL AHJ REQUIREMENTS. PROVIDE MFR'S PUMPOUT PORT KIT. PROVIDE SAMPLING PORT IF REQUIRED BY AHJ. 1
1 P417	FREEZELESS ROOF HYDRANT	WOODFORD	RHY2-MS	3/4"				1	PROVIDE MOUNTING SYSTEM AND DRAIN. ROUTE 1/8" DRAIN LINE TO NEAREST APPROVED DRAIN WITH AIR GAP. HYDRANT TO BE PROVIDED WITH A DOUBLE CHECK BACKFLOW PREVENTER.
P418	TRAP PRIMER	SIOUX CHIEF	SERIES 695	1/2"				3	OR APPROVED EQUIVALENT. AMOUNTS AS REQUIRED

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DESIGNED BY: JBA

REVISIONS

△	ISSUE	DATE
	OTP	02/15/23
1	OTB SET	01/05/24

NORTH CAROLINA PROFESSIONAL SEAL 051196 ENGINEER JASON M. SCATES
Jan 04, 2024

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CIRCLE K STORE INC.

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PLUMBING-SCHEDULES AND DETAILS

P1.3

SECTION	PLUMBING SPECIFICATIONS
15010 BASIC MECHANICAL REQUIREMENTS	1. ALL WORK TO BE DONE AND MATERIALS FURNISHED COMPLYING WITH APPLICABLE LAWS AND REGULATIONS, INCLUDING THE STATE OF XXXX MECHANICAL, PLUMBING AND FIRE SAFETY CODES. OBTAIN AND PAY FOR REQUIRED PERMITS AND FEES. 2. ALL MATERIALS USED SHALL BE NEW AND UNDAMAGED. 3. ALL WORK PERFORMED SHALL BE IN ACCORDANCE WITH CURRENT CONSTRUCTION INDUSTRY STANDARDS AND WORKMANSHIP. 4. FURNISH SHOP DRAWINGS TO ARCH/ENGINEER FOR APPROVAL PRIOR TO PLACING DELIVERY ORDERS. PROVIDE SHOP DRAWINGS OF ALL MANUFACTURED EQUIPMENT AND MATERIALS EXCEPT PIPE, PIPE FITTINGS AND GALVANIZED DUCTWORK. 5. FURNISH ACCESS DOORS (RATED OR NON-RATED AS REQUIRED) WHERE VALVES OR EQUIPMENT ARE CONCEALED BEHIND A NON ACCESSIBLE CEILING OR WALL. FURNISH ACCESS DOORS TO GENERAL CONTRACTOR FOR INSTALLATION. 6. FURNISH STEEL PIPE SLEEVES WHERE PIPES PENETRATE RATED WALLS. PROVIDE FIRESTOPPING MATERIALS AND SYSTEM TO MAINTAIN THE REQUIRED RATING OF THE WALL PENETRATED. PROVIDE SHOP DRAWINGS SHOWING LISTING AND RATING OF FIRESTOPPING MATERIALS. 7. ALL MANUFACTURED EQUIPMENT, ACCESSORIES AND MATERIALS SHALL BE USED AS INTENDED BY THE MANUFACTURER IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS. 8. CONTRACTOR SHALL PROVIDE IN ADDITION TO ANY OTHER WARRANTIES SPECIFIED, A ONE YEAR FULL LABOR AND MATERIAL WARRANTY ON ALL WORKMANSHIP, MATERIAL AND EQUIPMENT FURNISHED FOR THIS PROJECT. 9. THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL OPENINGS AND REQUIRED LINTELS NEEDED FOR THE GENERAL CONTRACTOR FOR THE INSTALLATION OF MECHANICAL EQUIPMENT. 10. SAWCUTS, LINTELS, HEADERS, AND STRUCTURAL MODIFICATIONS TO THE BUILDING STRUCTURE NEEDED FOR THE INSTALLATION OF MECHANICAL EQUIPMENT SHALL BE APPROVED BY THE GENERAL CONTRACTOR, BEFORE INSTALLATION. 11. IN GENERAL, OPENINGS AND REQUIRED LINTELS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR. THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR PROVIDING DETAILS AND TEMPLATES OF ALL OPENINGS NECESSARY FOR MECHANICAL EQUIPMENT INSTALLATION INCLUDING: HOUSING, ACCESS DOORS, INSPECTION DOORS, AND PASSAGEWAYS FOR MECHANICAL EQUIPMENT. THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR SEALING CRACKS AND FINISHING ROUGH EDGES LEFT FOLLOWING MECHANICAL INSTALLATION. 12. APPROVAL EQUALS: PLUMBING ITEMS MANUFACTURED BY A COMPANY OTHER THAN THAT WHICH WAS SPECIFIED IN THE SCHEDULE MAY BE SUBSTITUDED BY APPROVED SHOP DRAWINGS CONTIGENT UPON MEETING THE DESIGN, APPEARANCE, AND FUNCTIONAL STANDARDS ESTABLISHED BY THE ORIGINALLY SPECIFIED ITEM(S). THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING DIMENSIONS, CLEARANCES, ASSEMBLY, FIT, ETC. OF THE APPROVED EQUAL(S), AND THEIR AFFECT ON OTHER EQUIPMENT FIT AND OPERATION. THE CONTRACTOR IS LIABLE FOR ANY ADDED COSTS TO HIMSELF OR OTHERS CAUSED BY THE APPROVED EQUALS.

SECTION	PLUMBING SPECIFICATIONS
15100 VALVES	1. BALL VALVES SHALL BE CLASS 125 FOR WATER WITH ENDS AND MATERIALS TO MATCH PIPING SYSTEMS. 2. BALL VALVES 2" AND SMALLER SHALL HAVE BRONZE BODY, STAINLESS STEEL BALL, TEFLON SEATS, AND STUFFING BOX RING, LEVER HANDLE AND BALANCING STOPS, ENDS TO MATCH PIPING SYSTEM.
15140 SUPPORTS & ANCHORS	1. FURNISH PIPE AND DUCT HANGERS, WHERE REQUIRED, FIRMLY SUPPORTED FROM BUILDING STEEL, CONCRETE OR MASONRY STRUCTURE. SUPPORT PIPING SYSTEMES SECURELY WHILE ALLOWING FOR PIPE AND BUILDING EXPANSION AND CONTRACTION. PROVIDE COPPER PLATED HANGERS, FOR COPPER PIPE. USE ADJUSTABLE CLEVIS HANGERS OR ADJUSTABLE STEEL BAND HANGERS. MAXIMUM SPACING SHALL BE 5' FOR 1/2" PIPING, 7' FOR 3/4" TO 1/4" PIPING, 9' FOR 1-1/2" TO 2" PIPING. FURNISH PLUMBING EQUIPMENT SUPPORTS AS DETAILED OR AS REQUIRED TO SAFELY AND PERMANENTLY CARRY THE WEIGHT OF THE EQUIPMENT.
15250 PLUMBING INSULATION	1. INSULATE ABOVE FLOOR WATER PIPING WITH ELASTOMERIC PLACTIC PERFORMED PIPE INSULATION WITHOUT JACKETING. ALL INSULATING MATERIALS TO HAVE FLAME SPREAD RATING OF 25 OR LESS AND SMOKE DEVELOPMENT RATING OF 50 OR LESS AS TESTED BY ANSI/ASTM E 84 (NFPA 233) METHOD. INSULATE ALL PIPING WITH SURFACE TEMPERATURES BELOW 75 DEGREE F WITH 1/2" INSULATION. INSULATE ALL PIPING WITH SURFACE TEMPERATURES 75 DEGREES F AND HIGHER WITH 1" THICK INSULATION. INSTALL MINIMUM 1" INSULATION ON ALL HOT WATER PIPING AND THE FIRST 8' OF COLD WATER PIPING AT THE TANK. JOINTS IN INSULATION SHALL BE GLUED, NOT TAPED. WHERE PIPES ARE EXPOSED AND LESS THAN 8' ABOVE FLOOR, PROVIDE HEAVY DUTY METAL JACKETING OVER INSULATION. INSULATE ABOVE FLOOR HORIZONTAL STORM PIPING WITH 1" FIBERGLASS PERFORMED PIPE INSULATION WITH FACTORY APPLIED ALL PURPOSE COVER.
15411 WATER DISTRIBUTION SYSTEM	1. ABOVE GRADE: WATER PIPING SHALL BE CROSSLINKED PE (PEX) TUBING: PEX TUBE SHALL BE TESTED AND CERTIFIED FOR POTABLE WATER SYSTEMS, AND SHALL COMPLY WITH ANSI/NSF STANDARD 14, ANSI/NSF STANDARD 61, AND ASTM F876 AND/OR ASTM F877. TUBE SHALL BE LABELED WITH THE ABOVE CERTIFICATIONS. PROVIDE PEX TUBING SYSTEM BY ONE OF THE FOLLOWING: UPONOR, OR APPROVED PEX ALTERNATIVE. FITTINGS AND CONNECTORS SHALL BE BY THE SAME MANUFACTURER AND ASSEMBLED WITH THE MANUFACTURER'S APPROVED TOOLS. THE SAME CONNECTION METHOD SHALL BE USED THROUGHOUT THE INSTALLATION. a. AT CONTRACTOR'S OPTION, IN LIEU OF PEX PIPING SYSTEM AS SPECIFIED ABOVE TYPE L COPPER ASTM B 75, ASTM B 88, ASTM 251, ASTM B 447 WITH WROUGHT COPPER SOLDER-JOINT FITTINGS ASME B 16. 2. BELOW GRADE: WATER PIPING SHALL BE PEX PIPING SYSTEM IN COMPLIANCE WITH THE UPONOR PLUMBING DESIGN ASSISTANCE MANUAL (PDAM), CURRENT EDITION AND THE UPONOR PIPING SYSTEMS INSTALLATION GUIDE, CURRENT EDITION (OR APPROVED ALTERNATIVE). CROSSLINKED PE (PEX) TUBING, ASTM F876 WITHOUT JOINTS BENEATH THE SLAB. a. AT CONTRACTOR'S OPTION, IN LIEU OF PEX PIPING TYPE K COPPER WITH WROUGHT COPPER SOLDER-JOINT FITTINGS. SOLDER SHALL BE 9596-396 TIN-ANTIMONY ANSI/ASTM B 32 FOR HEATING SYSTEM PIPING. 3. THOROUGHLY FLUSH AND CLEAN ALL NEW AND EXISTING WATER PIPING SYSTEMS. TEST ALL PIPING SYSTEMS PER REGULATIONS IN ITEM NO.1 OR AT 225 PSI FOR A MINIMUM OF 2 HOURS WITH NO PRESSURE DROP INDICATED PRIOR TO INSULATING. 4. STERILIZE ALL DOMESTIC WATER PIPING PRE REQUIREMENTS OF LOCAL HEALTH DEPARTMENT.
15420 DRAINAGE & VENT SYSTEMS	1. WITHIN BUILDING, SCHEDULE 40 PVC, DWV TYPE PIPE AND SOLVENT WELDED PIPE FITTINGS, SCHEDULE 30 PVC PIPE MAY BE USED FOR VENT PIPING WHERE PERMITTED BY CODE. HORIZONTAL PIPE SHALL BE SUPPORTED BY ADJUSTABLE RING HANGERS EQUAL TO ITT-GRINNEL FIG. 97. VERTICAL PIPING SHALL BE SUPPORTED AT EACH FLOOR OR ATTIC LEVEL BY RISER. INSTALL UNDERGROUND PVC PIPE ACCORDING TO ASTM D2321 1
15440 PLUMBING FIXTURES	1. PROVIDE AIR CHAMBERS AT EACH FIXTURE CONNECTION. AIR CHAMBERS SHALL BE ONE SIZE LARGER THAN SUPPLY PIPE AND SHALL BE 12" LONG. WHERE REQUIRED BY PLUMBING CODE, FURNISH AND INSTALL MANUFACTURED WATER HAMMER ARRESTORS. 2. PLUMBING FIXTURES SHALL BE INSTALLED WHERE SHOWN ON THE ARCHITECTURAL DRAWINGS. INSTALL FIXTURES LEVEL AND PLUMB. FURNISH TRAPS WHERE REQUIRED. FIXTURES SHALL BE EASILY REMOVABLE FOR SERVICE AND CLEANING. 3. PROVIDE CHROME PLATED RIGID OR FLEXIBLE SUPPLIES TO FIXTURES WITH STOP VALVES, CHROME PLATED 17 GAUGE BRASS TRAPS WITH CHROME PLATED ESCUTCHEONS. 4. SEAL ALL FIXTURES TO WALL AND FLOOR USING SILICONE SEALANT. MATCH SEALANT COLOR TO FIXTURE COLOR. 5. FIXTURES DESIGNATED BARRIER FREE SHALL BE INSTALLED IN COMPLIANCE WITH AMERICAN'S WITH DISABILITIES ACT. 6. ALL CLEANOUT COVERS TO BE STAINLESS STEEL.

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PLUMBING-SPECIFICATIONS

P1.4