GENERIC HVAC ABBREVIATIONS
(REFER TO CONTROL ABBREVIATIONS FOR ADDITIONAL NOMENCLATURE)

°F	DEGREES FAHRENHEIT	ID	INSIDE DIAMETER
°C	DEGREES CELSIUS	IN	INCHES
Ø	DIAMETER	INSUL	INSULATION
ACV	AUTOMATIC CONTROL VALVE	KW	KILOWATT
AD	ACCESS DOOR	KVA	KILOVOLT AMPERE
ADJ	ADJUSTABLE		
ADDL	ADDITIONAL	L	LENGTH
AFF	ABOVE FINISHED FLOOR	LB	POUND
AFG	ABOVE FINISHED GRADE	LAB	LABORATORY
ALT	ALTERNATE	LF	LINEAR FEET
AP	ACCESS PANEL	LVG	LEAVING
ARCH	ARCHITECT		
ATC	AUTOMATIC TEMPERATURE CONTROL	M	ONE THOUSAND
ATCC	ATC COMPRESSOR	MAX	MAXIMUM
ATCD	ATC COMPRESSOR DRYER	MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
ATCR	ATC COMPRESSOR RECEIVER	MCA	MINIMUM CIRCUIT AMPS
ATV	ATMOSPHERIC VENT	MCC	MOTOR CONTROL CENTER
AVG	AVERAGE	MECH	MECHANICAL
		MEZZ	MEZZANINE
BBD	BOILER BLOW DOWN	MFR	MANUFACTURER
BDT	BLOWDOWN TANK	MH	MANHOLE
BF	BOILER FEED WATER	MIN	MINIMUM
BFF	BELOW FINISHED FLOOR	MTD	MOUNTED
BHP	BRAKE HORSEPOWER	MU	MAKEUP WATER
BLDG	BUILDING	N/A	NOT APPLICABLE
BLR	BOILER	NC	NORMALLY CLOSED
BOD	BOTTOM OF DUCT	NC	NOISE CRITERIA
BOP	BOTTOM OF PIPE	NIC	NOT IN CONTRACT
BSMT	BASEMENT	NO	NORMALLY OPEN
BTU	BRITISH THERMAL UNIT	NO.	NUMBER
BTUH	BRITISH THERMAL UNIT PER HOUR	NOM	NOMINAL
		NTS	NOT TO SCALE
C	CONVECTOR		
CA	COMPRESSED AIR	OB	OCTAVE BAND
CF	CEILING FAN	OC	ON CENTER
CL	CENTERLINE	OD	OUTSIDE DIAMETER
CLG	CEILING	ODP	OPEN DRIP PROOF
CO	CLEAN-OUT	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
COL	COLUMN	OFOI	OWNER FURNISHED OWNER INSTALLED
COMP	COMPRESSOR	OV	OUTLET VELOCITY
CONC	CONCRETE		
CONN	CONNECTION	PCF	POUNDS PER CUBIC FOOT
CONTR	CONTRACTOR	PD	PRESSURE DROP
CORR	CORRIDOR	PH	PHASE
CUF	CUBIC FEET	PLBG	PLUMBING
CUH	CABINET UNIT HEATER	POS	PROVIDED BY OTHER SECTION(S)
CYL	CYLINDER	PRESS	PRESSURE
		PRIM	PRIMARY
D	DRAIN	PSIA	POUNDS PER SQUARE INCH ABSOLUTE
DB	DRY BULB TEMPERATURE	PSID	POUNDS PER SQUARE INCH DIFFERENTIAL
DC	DRY COOLER	PSIG	POUNDS PER SQUARE INCH GAUGE
DDC	DIRECT DIGITAL CONTROL	PVC	POLYVINYL CHLORIDE
DDCFP	DIRECT DIGITAL CONTROL FIELD PANEL		
DIA	DIAMETER	REP	REPRESENTATIVE
DIM	DIMENSION	RET	RETURN
DN	DOWN	REQD	REQUIRED
DWG	DRAWING	REQS	REQUIREMENTS
		RH	RELATIVE HUMIDITY
EA	EACH	RM	ROOM
EAT	ENTERING AIR TEMPERATURE	RPM	REVOLUTIONS PER MINUTE
EFF	EFFICIENCY		
ECUH	ELECTRIC CABINET UNIT HEATER	SCH	SCHEDULE
ELEC	ELECTRICAL	SOV	SOLENOID OPERATED VALVE
ELEV	ELEVATION	SPECS	SPECIFICATIONS
EMER	EMERGENCY	SQ	SQUARE
EMS	ENERGY MANAGEMENT SYSTEM	SQFT	SQUARE FEET
ENT	ENTERING	SS	STAINLESS STEEL
EQUIP	EQUIPMENT	STD	STANDARD
EUH	ELECTRIC UNIT HEATER	STDBY	STANDBY
EXH	EXHAUST	STL	STEEL
EXP	EXPANSION	SUCT	SUCTION
		SUP	SUPPLY
FTR	FINNED TUBE RADIATION		
FCV	FLOW CONTROL VALVE	TA	THROW-AWAY
FFOP	FIREFIGHTERS OVERRIDE PANEL	TAV	THERMOSTATIC AIR VENT
FG	FIBERGLASS	TEFC	TOTALLY ENCLOSED FAN COOLED
FLEX	FLEXIBLE	TEL	TELEPHONE
FLR	FLOOR	TEMP	TEMPERATURE
FLRDR	FLOOR DRAIN	TOD	TOP OF DUCT
FP	FIRE PROTECTION	TOP	TOP OF PIPE
FPM	FEET PER MINUTE	TYP	TYPICAL
FT	FEET		
FT/SEC	FEET PER SECOND	UH	UNIT HEATER
FURN	FURNISHED		
FVNR	FULL VOLTAGE NON-REVERSING	V	VENT
		VEL	VELOCITY
G	GAS	VERT	VERTICAL
GA	GAUGE	VFC	VARIABLE FREQUENCY CONTROLLER
GAL	GALLONS	VTR	VENT THROUGH ROOF
GALV	GALVANIZED		
GC	GENERAL CONTRACTOR	W	WIDTH
GND	GROUND	W/	WITH
GPH	GALLONS PER HOUR	W/O	WITHOUT
GPM	GALLONS PER MINUTE	WB	WET BULB TEMPERATURE
GRD	GRADE (GROUND LEVEL)	WF	WIDE FLANGE
GWB	GYPSUM WALL BOARD	WG	WATER GAUGE
		WRT	WITH RESPECT TO
H	HEIGHT		
HCPD	HANDICAPPED		
HD	HEAD	X	EXISTING EQUIPMENT TO BE REMOVED
HP	HORSEPOWER	XM	EXISTING EQUIPMENT TO REMAIN
HPG	HIGH PRESSURE GAS	XN	NEW LOCATION OF RELOCATED EQUIPMENT
HR	HOUR	XR	EXISTING EQUIPMENT TO BE RELOCATED
HZ	HERTZ		
HX	HEAT EXCHANGER		

AIR SYSTEM SPECIFIC ABBREVIATIONS

AC	AIR CONDITIONING	LAT	LEAVING AIR TEMPERATURE
ACC	AIR COOLED CONDENSER	LD	LINEAR DIFFUSER
ACCU	AIR COOLED CONDENSING UNIT	LUVR	LOUVER
ACD	AUTOMATIC CONTROL DAMPER	LVDR	LOUVERED DOOR
ACU	AIR CONDITIONING UNIT		
AF	AIR FOIL	OA	OUTSIDE AIR
AHU	AIR HANDLING UNIT	OAI	OUTSIDE AIR INTAKE
ALD	ACOUSTICALLY LINED DUCTWORK	OBD	OPPOSED BLADE DAMPER
ATD	AIR TERMINAL DEVICE	OED	OPEN END DUCT
AVS	AIR VOLUME TRAVERSE STATION		
		PHC	PREHEAT COIL
BDD	BACKDRAFT DAMPER		
BI	BACKWARD INCLINED	RA	RETURN AIR
BOD	BOTTOM OF DUCT	RD	REFRIGERANT DISCHARGE (HOT GAS)
		RF	RETURN FAN
CACU	COMPUTER ROOM AIR CONDITIONING UNIT	RG	RETURN GRILLE
CC	COOLING COIL	RHC	REHEAT COIL
CD	CEILING DIFFUSER	RL	REFRIGERANT LIQUID
CFM	CUBIC FEET PER MINUTE	RLF	RELIEF
CG	CEILING GRILLE	RR	RETURN REGISTER
		RS	REFRIGERANT SUCTION
DD	DUAL DUCT SUPPLY AIR TERMINAL	RTU	ROOF TOP UNIT
DIFF	DIFFUSER	RV	ROOF VENT
DWDI	DOUBLE WIDTH DOUBLE INLET		
DWSI	DOUBLE WIDTH SINGLE INLET	SA	SUPPLY AIR
DX	DIRECT EXPANSION	SATT	SOUND ATTENUATOR
		SCR	SCREEN
EF	EXHAUST FAN	SD	SMOKE DAMPER
EG	EXHAUST GRILLE	SDET	SMOKE DETECTOR
EHC	ELECTRICAL HEATING COIL	SEF	SMOKE EXHAUST FAN
EPHC	ELECTRIC PREHEAT COIL	SF	SUPPLY FAN
ER	EXHAUST REGISTER		
ERHC	ELECTRIC REHEAT COIL		
ESP	EXTERNAL STATIC PRESSURE	SG	SUPPLY GRILLE
		SGD	SLIDE GATE DAMPER
F	FAN	SM	SHEETMETAL
F&B	FACE AND BYPASS	SP	STATIC PRESSURE
FB	FAN BOX	SR	SUPPLY REGISTER
FC	FORWARD CURVED	SWDI	SINGLE WIDTH DOUBLE INLET
FA	FREE AREA	SWSI	SINGLE WIDTH SINGLE INLET
FCU	FAN COIL UNIT		
FD	FIRE DAMPER (W/ ACCESS DOOR)	TE	TOILET EXHAUST
FLTR	FILTER	TF	TRANSFER FAN
FPI	FINS PER INCH	TG	TRANSFER GRILLE
FSD	COMBINATION AUTOMATIC FIRE/SMOKE DAMPER WITH ACCESS DOOR	TR	TRANSFER
--		TSP	TOTAL STATIC PRESSURE
GE	GENERAL EXHAUST	UC	UNDERCUT DOOR
GH	GRAVITY HOOD		
		VD	VOLUME DAMPER
HC	HEATING COIL	VV	VARIABLE VOLUME SUPPLY AIR TERMINAL BOX
HEGA	HIGH EFFICIENCY GAS ABSORBER AIR FILTER	VVE	VARIABLE VOLUME EXHAUST AIR TERMINAL BOX
HEPA	HIGH EFFICIENCY PARTICULATE AIR FILTER		
HPU	HEAT PUMP UNIT		
HRU	HEAT RECOVERY UNIT	WMS	WIRE MESH SCREEN
HV	HEATING & VENTILATING UNIT		
HU	HUMIDIFIER		
IH	INTAKE HOOD		

HVAC GENERAL NOTES

GENERAL

1. HVAC GENERAL NOTES, SYMBOLS LIST AND DETAILS ARE APPLICABLE TO ALL "M" SERIES DRAWINGS.
2. DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO INDICATE CAPACITY, SIZE, APPROXIMATE LOCATION AND GENERAL ARRANGEMENT. DETERMINE EXACT LOCATIONS OF SYSTEMS AND COMPONENTS IN FIELD.
3. DRAWINGS CANNOT BE FULLY AND CORRECTLY INTERPRETED WITHOUT REFERENCE TO LEGENDS, DETAILS, SCHEDULES AND SPECIFICATIONS. IT IS THE INTENT OF THE DRAWINGS TO SHOW THE INSTALLATION, AS DETAILED BY THE TYPICAL ARRANGEMENT. ITEMS SHOWN ONCE ON THE FLOOR PLANS, ELEVATIONS, DETAILS, OF DIAGRAMS MAY NOT BE REPEATED IN FULL FOR OTHER TYPICAL INSTANCES.
4. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
5. PROVIDE INFORMATION AND HARDWARE AS NECESSARY TO COORDINATE CONCRETE PADS AND STEEL PLATFORMS REQUIRED FOR MECHANICAL WORK.
6. COORDINATE ROOF AND WALL PENETRATIONS WITH WORK OF OTHER SECTIONS AND WITH FLASHING REQUIREMENTS. COORDINATE SLAB PENETRATIONS WITH WORK OF OTHER SECTIONS AND WITH EXISTING POST-TENSION CABLES.
7. RUN DUCTS AND PIPING CONCEALED, UNLESS SPECIFIED OTHERWISE, AND CLEAR OF CEILING INSERTS. ALL DUCTWORK SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO WALL AND UNDERSIDE OF BEAMS AND JOISTS.
8. INSTALL SENSORS (TEMPERATURE, HUMIDITY, CO2, THERMOSTATS) AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY ARCHITECT. MOUNTING HEIGHT AFF SHALL COMPLY WITH ADA AND SHALL BE MOUNTED LEVEL WITH ADJACENT SWITCHES (IE LIGHT SWITCHES).
9. COORDINATE WORK OF THIS SECTION WITH THAT OF OTHER SECTIONS AND WITH ALL TRADES INVOLVED. PROVIDE OFFSETS IN PIPING AND DUCTS (INCLUDING DIVIDED DUCTS) AND TRANSITIONS AROUND OBSTRUCTIONS.
10. ACCESS PANELS SHALL BE PROVIDED TO CLEAN COILS AND SERVICE DAMPERS, HEATERS, VALVES AND ALL CONCEALED MECHANICAL EQUIPMENT. PROVIDE ACCESS PANELS THROUGH BUILDING ASSEMBLIES TO SERVICE AND MAINTAIN EQUIPMENT UNLESS SUCH EQUIPMENT IS INSTALLED IN EXPOSED LOCATIONS OR ABOVE LAY-IN CEILINGS. COORDINATE THE LOCATION OF ACCESS DOORS AND PANELS AND VERIFY THE EXACT QUANTITY, SIZE, AND LOCATIONS AFTER THE SYSTEMS AND EQUIPMENT REQUIRING ACCESS HAVE BEEN INSTALLED AND PRIOR TO THE CLOSURE OF AFFECTED CEILINGS AND BUILDING ASSEMBLIES. MINIMUM ACCESS PANEL AND DOOR SIZE SHALL BE 18"x18" UNLESS OTHERWISE NOTED. OBTAIN APPROVAL FOR ALL PANEL LOCATIONS FROM ARCHITECT. SEE ARCHITECTURE DRAWINGS AND SPECIFICATIONS FOR FOR ACCESS PANEL REQUIREMENTS.
11. ELEMENTS OF THE WORK SHALL BE INSTALLED IN A MANNER SUCH THAT AT SUBSTANTIAL COMPLETION THE FOLLOWING ITEMS, NEW OR EXISTING SHALL BE "FULLY AND REASONABLY ACCESSIBLE": HVAC CONTROL BOXES, JUNCTION BOXES, VALVES (OF EVERY SHAPE, SORT AND FUNCTION), DDC CONTROL BOXES, ELECTRICAL PANELS, FILTERS, BELTS, WATER COILS, DISCONNECT SWITCHES, AND MAINTENANCE ACCESS ELEMENTS INCLUDING PULL SPACE.
    A. "FULLY AND REASONABLY ACCESSIBLE" SHALL BE DEFINED AS: NATIONAL ELECTRIC CODE REQUIRED CLEARANCE FOR POWERED EQUIPMENT AND CAPABLE OF BEING ACCESSED FOR SERVICE, REPAIR OR REPLACEMENT BY AN AVERAGE SIZED INDIVIDUAL (ON A LADDER IF NECESSARY) AND CAPABLE OF BEING SERVICED OR REMOVED WITHOUT REMOVING OR MODIFYING OR DISTORTING OTHER COMPONENTS OF THE WORK. THE DESIGN INTENT PROVIDES A MINIMUM 2'x2'x2' ZONE FOR MAINTENANCE.
    B. CONFLICT WITH MEETING THESE REQUIREMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE IN A TIMELY MANNER AND SHALL BE CORRECTED AT NO ADDITIONAL COST.
12. SUPPORT ALL EQUIPMENT, PIPING AND DUCTWORK FROM BUILDING STRUCTURE. PROVIDE VIBRATION ISOLATION FOR ROTATING EQUIPMENT, DUCTWORK AND PIPING IN ACCORDANCE WITH THE SPECIFICATIONS. PROVIDE TO GC A LIST OF ALL WEIGHTS AND METHODS OF SUPPORT FOR COORDINATION. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
13. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH NEC, AND DIVISION 16000 SPECIFICATIONS.
14. ALL MATERIALS AND EQUIPMENT SHALL BE NEW.

AIR SYSTEM SPECIFIC NOTES:

1. VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. VERIFY AND PROVIDE DUCT TRANSITIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DIMENSIONS BEFORE FABRICATION.
2. SHEETMETAL FITTINGS SHOWN ARE TO BE PROVIDED. NO SUBSTITUTES SHALL BE ALLOWED WITHOUT PRIOR CONSENT FROM ARCHITECT/ENGINEER.
3. REFER TO SPECIFICATIONS FOR DUCTWORK CONSTRUCTION CLASSES, SEAL, AND LEAKAGE CLASSES.
4. EXTERIOR LOUVERS ARE INDICATED FOR LOCATION ONLY.
5. SMOKE DETECTORS SHALL BE FURNISHED AND WIRED TO THE FIRE ALARM SYSTEM. MOUNT THE DETECTORS IN DUCTWORK, WHERE REQUIRED BY CODE. WIRE THE DETECTORS TO THE BAS SYSTEM AND FAN STARTERS FOR SHUTDOWN.
6. SMOKE DAMPERS SHALL BE UL555S LISTED. FIRE DAMPERS SHALL BE UL555 LISTED. PROVIDE FIRE DAMPERS, SMOKE DAMPERS AND ASSOCIATED ACCESS PANELS WHERE DAMPERS ARE SHOWN ON THE DRAWINGS IN COMPLIANCE WITH APPLICABLE BUILDING AND MECHANICAL CODES AND NFPA 90A. ACCESS DOOR DIMENSIONS SHALL MEET REQUIREMENTS OF NFPA 90A AND NFPA 90B.
7. REFER TO REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF AIR TERMINAL DEVICES.
8. INTERNAL AIR FLOW DIMENSIONS ARE SHOWN FOR DUCTS. INCREASE SIZE FOR LINER IF APPLICABLE.
9. DIFFUSER SIZES SHOWN ARE NECK SIZES; REGISTER AND GRILLE SIZE ARE NOMINAL. REFER TO DIFFUSER SCHEDULE FOR DUCT RUN-OUT SIZES.
10. PROVIDE FLEXIBLE CONNECTIONS ON ALL DUCTS CONNECTING TO FANS AND AIR HANDLING UNITS UNLESS INTERNALLY ISOLATED. ALL DUCTS TO BE GROUNDED ACROSS FLEXIBLE CONNECTION WITH FLEXIBLE COPPER GROUNDING STRAPS.
11. THE INSIDE OF DUCTWORK VISIBLE THROUGH A GRILLE OR DIFFUSER SHALL BE PAINTED FLAT BLACK.
12. ALL RETURN AIR OPENINGS ABOVE CEILING SHALL BE PROVIDED WITH A 1/4" MESH ALUMINUM OR GALVANIZED SCREEN (80% FREE AREA MINIMUM).
13. INSULATE DUCTWORK: PERFORM TESTS BEFORE INSULATING.
14. ELBOWS IN DUCT SYSTEMS SHALL BE FULL RADIUS (CENTERLINE RADIUS = 1.5 DUCT WIDTH) WHERE SPACE PERMITS. WHERE LIMITED CLEARANCE OCCURS, PROVIDE SHORT RADIUS ELBOW WITH FULL LENGTH SPLITTER VANES PER SMACNA. MITERED (SQUARE) ELBOWS WITH TURNING VANES MAY NOT BE USED.
15. UNLESS INDICATED OTHERWISE, AND AS A MINIMUM PROVIDE 24"x24" MINIMUM SIZE CLEANOUTS IN KITCHEN EXHAUST DUCTS AT CHANGES IN DIRECTION AND BASES OF RISERS, AND EVERY 10 FEET IN STRAIGHT RUNS.
16. MANUAL DAMPERS ARE NOT SHOWN ON THE DRAWINGS IN ORDER FOR DRAWING CLARITY. PROVIDE MANUAL ADJUSTABLE DAMPERS ON EACH LOW PRESSURE SUPPLY, RETURN, AND EXHAUST DUCT TAKE OFF, AND AT EACH TAKE OFF TO REGISTERS, GRILLES, DIFFUSERS.

PIPING SYSTEM SPECIFIC NOTES:

1. VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER CERTIFIED DRAWINGS. VERIFY AND PROVIDE FITTINGS TO TRANSITION TO FURNISHED EQUIPMENT CONNECTION SIZES. FIELD VERIFY AND COORDINATE ALL DIMENSIONS BEFORE FABRICATION.
2. ALL CONDENSATE DRAIN LINES SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH "P" TRAP, CONNECTED TO BUILDING DRAINAGE SYSTEMS. SIZE DEPTH OF TRAP FOR ASSOCIATED AIR PRESSURE DIFFERENTIAL. REFER TO DETAIL ON DRAWINGS.
3. PERFORM SPECIFIED TESTS BEFORE INSULATING PIPING.
4. PROVIDE HANGERS, CLAMPS, OFFSETS, EXPANSION JOINTS, ANCHORS AND GUIDES TO PREVENT STRESS ON PIPING.
5. PROVIDE VENTS AT HIGH POINTS IN PIPING SYSTEMS AND DRAIN VALVES AT LOW POINTS.
6. PROVIDE AT LEAST THREE-ELBOW SWING FOR PIPE TAKE-OFFS TO TERMINAL EQUIPMENT AND RISERS.
7. ISOLATION VALVES IN PIPING SYSTEMS ARE NOT SHOWN ON THE PLANS (FOR CLARITY) BUT ARE REQUIRED AT ALL PIPE BRANCHES AND CONNECTIONS TO EQUIPMENT. REFER TO DETAIL SHEETS AND FLOW DIAGRAMS.
8. PITCH CONDENSATE PIPING DOWNWARD IN DIRECTION OF FLOW. REFER TO SPECIFICATIONS FOR REQUIRED PITCH (I.E. GRADE OR SLOPE).
9. REFER TO MANUFACTURE FOR PIPE RUN-OUT SIZES TO INDIVIDUAL PIECES OF EQUIPMENT.

EQUIPMENT TAG SYMBOLS & ABBREVIATIONS



EXAMPLE EQUIPMENT TAGS:

- VRF 1 — VRF INDOOR UNIT
- VTAC 1 — VERTICAL PACKAGED AIR CONDITIONING UNIT
- SDET — SMOKE DETECTOR
- EF 1 — EXHAUST FAN
- ACCU 1 — VRF OUTDOOR UNIT
- RTU 1 — ROOFTOP AIR HANDLING UNIT
- EUH 1 — ELECTRIC UNIT HEATER
- FCU 1 / CU 1 — DX SPLIT SYSTEM INDOOR / OUTDOOR UNIT
- VV-1 / 600/200 / 150 — VARIABLE VOLUME SUPPLY AIR TERMINAL BOX** — OCCUPIED MAXIMUM/OCCUPIED MINIMUM CFM — UNOCCUPIED MINIMUM CFM
- VVE-1 / 600/200 / 150 — VARIABLE VOLUME EXHAUST AIR TERMINAL BOX** — OCCUPIED MAXIMUM/OCCUPIED MINIMUM CFM — UNOCCUPIED MINIMUM CFM

**NOTE: CONSTANT VOLUME BOX INDICATED WHEN MAX AND MIN CFM'S ARE EQUAL.

FLOW DIAGRAM EQUIPMENT SYMBOLS

- HUMIDIFIER
- FILTER BANK
- HEATING COIL
- PREHEAT COIL
- REHEAT COIL
- COOLING COIL
- CABINET HEATER
- UNIT HEATER
- FINNED TUBE RADIATION
- CHEMICAL FEED SYSTEM
- PUMP
- CENTRIFUGAL FAN WITH INLET GUIDE VANES
- CENTRIFUGAL FAN
- PROPELLER FAN
- PLENUM, PLUG, OR MIXED FLOW FAN
- INLINE CENTRIFUGAL FAN
- UPBLAST PROPELLER FAN
- UPBLAST CENTRIFUGAL FAN
- ROOF FAN
- AIR VALVE
- OPPOSED BLADE DAMPER W/ TWO POSITION ACTUATOR
- OPPOSED BLADE DAMPER W/ MODULATING ACTUATOR
- PARALLEL BLADE DAMPER W/ TWO POSITION ACTUATOR
- PARALLEL BLADE DAMPER W/ MODULATING ACTUATOR
- BACKDRAFT DAMPER
- AIR TERMINAL BOX
- AIR TERMINAL BOX WITH REHEAT COIL

CALL OUT SYMBOLS

- POINT OF CONNECTION TO EXISTING
- POINT OF DISCONNECTION FROM EXISTING
- SECTION DESIGNATION / SHEET NUMBER (1 / H3.1)
- DETAIL DESIGNATION / SHEET NUMBER (1 / H3.1)
- REVISION NUMBER (1)
- SUPPLY OR RETURN AIR RISER DESIGNATION (S/R 1)
- PIPING SYSTEM RISER DESIGNATION (HWS 1)
- EQUIPMENT ACCESS ZONE
- REFER TO DRAWINGS (XXX) FOR CONTINUATION
- SYMBOL DESIGNATES ASSOCIATED SYSTEM OR SERVICE (ie LPS)
- DIFFUSER, GRILLE, REGISTER LETTER DESIGNATOR (See schedule for ATD type)
- DESIGN CFM
- A(200) / (200) — ALTERNATE CFM LOCATION
- (200) — BALANCED CFM
- VOLUME DAMPER

REFER TO CONTROLS LEGEND SHEET FOR SYMBOLS USED ON FLOOR PLANS TO INDICATE LOCATION OF TEMPERATURE PRESSURE SENSORS AND GAS SENSORS (E.G. CARBON DIOXIDE)

2018 APPENDIX B - MECHANICAL DESIGN

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

THERMAL ZONE
WINTER DRY BULB: 16.1
SUMMER DRY BULB: 90.5

INTERIOR DESIGN CONDITIONS
OCCUPIED SPACES SUCH AS CASINO, HOTEL, RESTAURANT, SPA, ETC:
WINTER DRY BULB: 70 F
SUMMER DRY BULB: 75 F
RELATIVE HUMIDITY: 50%

UTILITY
WINTER DRY BULB: 60 F
SUMMER DRY BULB: 80 F
RELATIVE HUMIDITY: 50%

BUILDING HEATING LOAD: SEE SCHEDULES

BUILDING COOLING LOAD: SEE SCHEDULES

MECHANICAL SPACING CONDITIONING SYSTEM
UNITARY
DESCRIPTION OF UNIT: SEE SCHEDULES
HEATING EFFICIENCY: SEE SCHEDULES
COOLING EFFICIENCY: SEE SCHEDULES
SIZE CATEGORY OF UNIT: SEE SCHEDULES
BOILER
SIZE CATEGORY. IF OVERSIZED, STATE REASON.: N/A
CHILLER
SIZE CATEGORY. IF OVERSIZED, STATE REASON.: N/A

LIST EQUIPMENT EFFICIENCIES: SEE SCHEDULES

DUCTWORK

SINGLE LINE	DOUBLE LINE
EXISTING DUCT LINETYPE	
NEW DUCT LINETYPE	
HORIZONTAL OFFSET SUPPLY/RETURN /EXHAUST	
RISE OR DROP SUPPLY/RETURN/ EXHAUST	RISE/DROP
STANDARD RADIUS ELBOW (R = W) SUPPLY/RETURN EXHAUST	R / = W =
BULLHEAD SPLIT SUPPLY	GOOD FOR TAKEOFF TO RING DUCT
TAKEOFF TO DIFF/GRILLE W/BRANCH TAKE-OFF VOLUME DAMPER	HARD ELBOW
CEILING DUCT MTD DIFF/GRILLE W/BRANCH TAKE-OFF VOLUME DAMPER	
ACOUSTICALLY LINED DUCT	
OR EXISTING DUCT TO BE REMOVED	OR
OPEN END DUCT W/O & 1/2"x1/2" WMS	
FLEXIBLE DUCT	

SINGLE LINE	DOUBLE LINE
ROUND SUPPLY DUCT UP	
ROUND SUPPLY DUCT DOWN	
RECTANGULAR SUPPLY DUCT UP	
RECTANGULAR SUPPLY DUCT DOWN	
ROUND RETURN DUCT UP	
ROUND RETURN DUCT DOWN	
RECTANGULAR RETURN DUCT UP	
RECTANGULAR RETURN DUCT DOWN	
ROUND EXHAUST DUCT UP	
ROUND EXHAUST DUCT DOWN	
RECTANGULAR EXHAUST DUCT UP	
RECTANGULAR EXHAUST DUCT DOWN	
90° TAKE-OFF W/BRANCH TAKE-OFF VOLUME DAMPER (VD IN LOW PRESSURE SYSTEMS ONLY)	RING DUCT
BULLHEAD CONVERGE RETURN/EXHAUST W/BRANCH TAKE-OFF VOLUME DAMPER	
SIDEWALL DUCT MTD REGISTER/GRILLE W/BRANCH TAKE-OFF VOLUME DAMPER	
SUPPLY SIDEWALL LINEAR DIFFUSER (W/ 1" INTERNALLY LINED SM PLENUM) BRANCH CONN W/VD FOR EVERY 4' OF LINEAR	
SUPPLY CEILING LINEAR DIFFUSER (W/ 1" INTERNALLY LINED SM PLENUM) BRANCH CONN W/VD FOR EVERY 4' OF LINEAR	BOOT BY LD MFR

- AVS — AIR VOLUME TRAVERSE STATION
- SGD — SLIDE GATE DAMPER
- VD — MANUAL VOLUME DAMPER
- RVD — REMOTE OPERATED MANUAL VOLUME DAMPER
- FD — SELF-CLOSING FIRE DAMPER W/ACCESS DOOR
- ACD — AUTOMATIC CONTROL DAMPER W/ACCESS DOOR
- SD — AUTOMATIC SMOKE DAMPER W/ACCESS DOOR
- FSD — COMBINATION SMOKE/FIRE DAMPER W/ACCESS DOOR
- BDD — BACKDRAFT DAMPER
- T — THERMOSTAT
- C — CARBON DIOXIDE DETECTOR
- STANDARD 4-WAY BLOW SUPPLY DIFFUSER
- BLANKED FOR 3-WAY BLOW SUPPLY DIFFUSER
- BLANKED FOR 2-WAY BLOW SUPPLY DIFFUSER
- BLANKED FOR 1-WAY BLOW SUPPLY DIFFUSER
- OR — ROOF EXHAUST FAN SHOWN ON ROOF
- OR — ROOF EXHAUST FAN SHOWN ON FLOOR PLAN
- UC 1/2" — UNDERCUT DOOR
- LVDR 1.5 SF — LOUVERED DOOR
- RETURN OR EXHAUST AIR FLOW
- SUPPLY AIR FLOW

NOTE: NOT ALL SYMBOLS MAY BE APPLICABLE TO THIS PROJECT

Additions and Renovations to Harrah's Cherokee Valley River

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HVAC LEGEND AND GENERAL NOTES

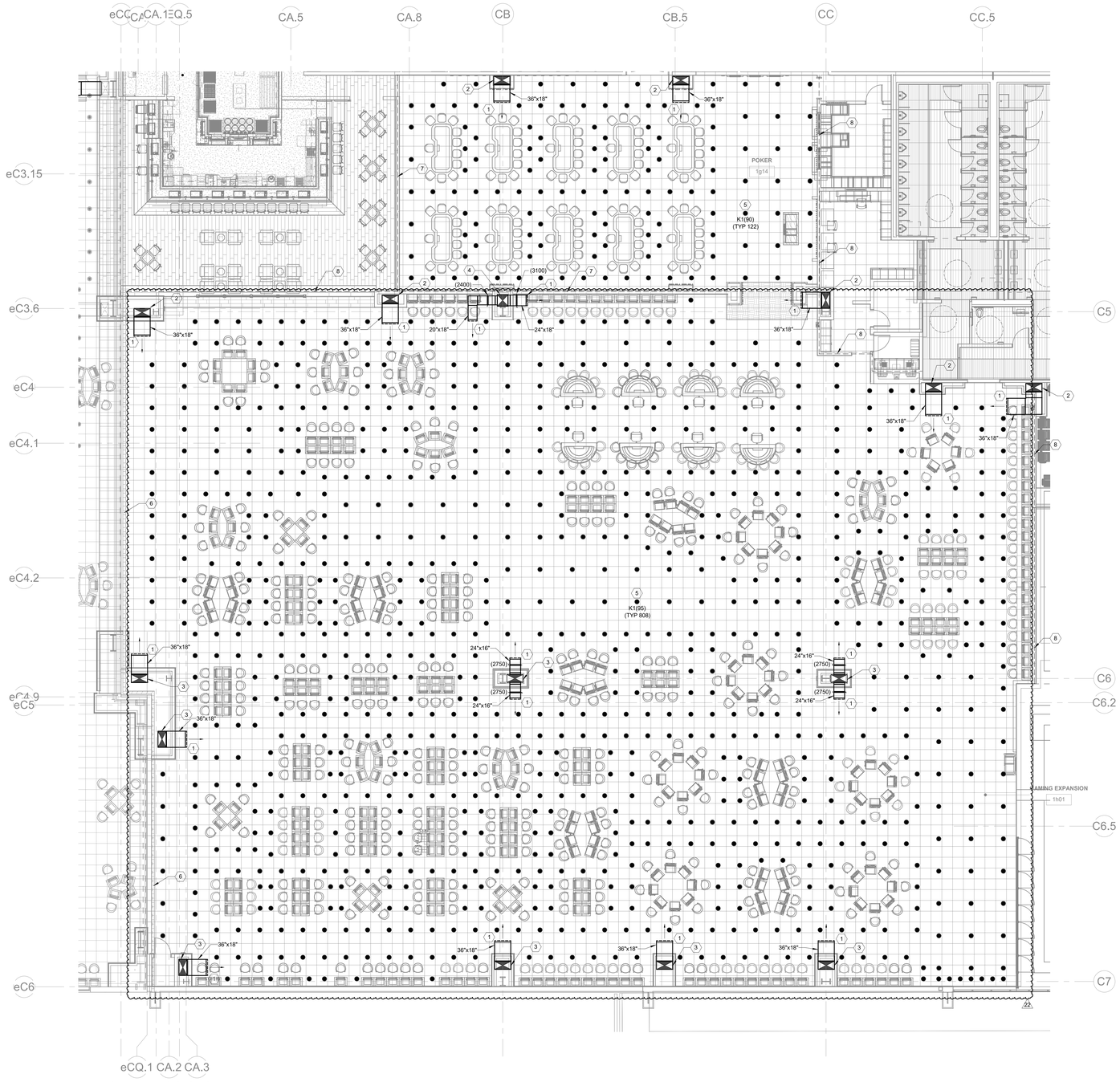
M-001

DRAWING PRINTED FULL SIZE (100%) = 36"x24" DRAWING PRINTED HALF SIZE (50%) WILL FIT ON A SHEET 18"x24" WITH 1/2" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (50%) WILL FIT ON A SHEET 24"x36" WITH 1" OF EXTRA SPACE ON ALL FOUR SIDES. IF THIS DRAWING IS NOT THE CORRECT SIZE AS INDICATED BY THE GRAPHIC SCALES AND THE NUMBERS ON THE LEFT, THEN THIS PRINT IS NOT TO SCALE. 2/15/2023 5:40:57 PM

790

KEYNOTES:

1. SUPPLY AIR OPEN-ENDED DUCT WITH WIRE MESH SCREEN IN UNDERFLOOR PLENUM.
2. 36"x18" SA UP TO ABOVE, SEE SHEETS MH-111G FOR CONTINUATION.
3. 36"x18" SA UP TO ABOVE, SEE SHEETS MH-111H FOR CONTINUATION.
4. 26"x24" SA UP TO ABOVE, SEE SHEETS MH-111G FOR CONTINUATION.
5. COORDINATE FLOOR GRILLE LOCATIONS WITH FINAL FLOOR GRID LAYOUT. TYPICAL.
6. UNDERFLOOR PARTITION ALONG THIS WALL TO SEPARATE EXISTING SIDE UNDERFLOOR SYSTEM FROM NEW EXPANSION UNDERFLOOR SYSTEM. SEE ARCHITECTURE DRAWINGS.
7. UNDERFLOOR PARTITION ALONG THIS WALL TO SEPARATE POKER ROOM UNDERFLOOR SYSTEM FROM GAMING ROOM UNDERFLOOR SYSTEM. SEE ARCHITECTURE DRAWINGS.
8. UNDERFLOOR PARTITION ALONG THIS WALL, SEE ARCHITECTURE DRAWINGS.



1 HVAC PART PLAN - CASINO FLOOR
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

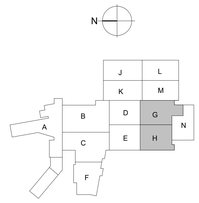
777 Casino Parkway
Murphy, NC 28906

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KEY PLAN

BULLETIN 18
09/27/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	1/8" = 1'-0"

REVISIONS

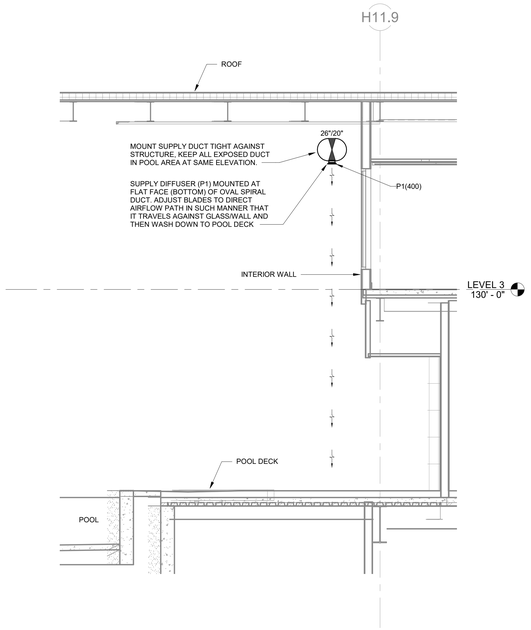
22 2023-0927 BULLETIN 18

HVAC PART PLAN - CASINO FLOOR

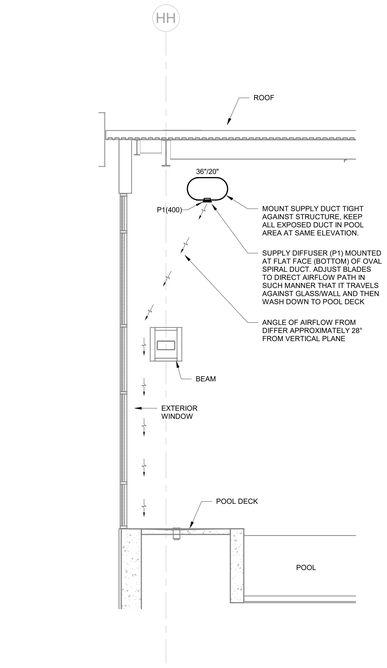
M-300

DRAWING PRINTED FULL SIZE (30in. x 42in)IF DRAWING PRINTED HALF SIZE (15in. x 21in), IT IS ON A SHEET TYPICALLY 24" x 36" WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15in. x 21in), IT IS ON A SHEET TYPICALLY 12" x 18" WITH 0.75

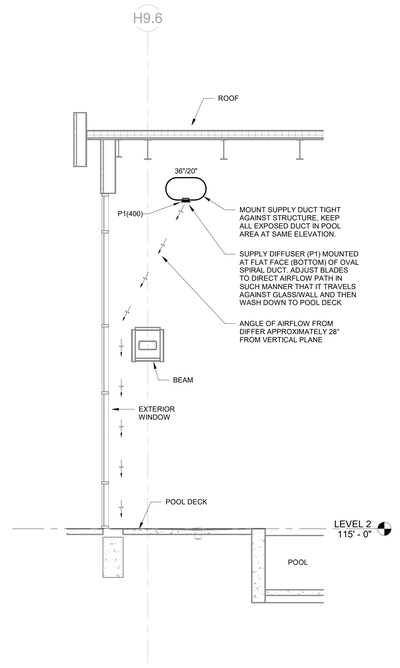
790



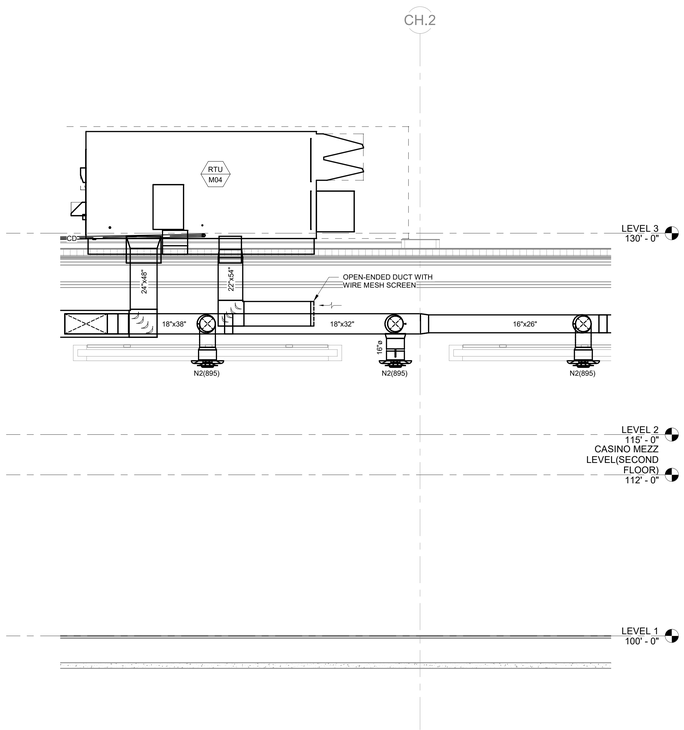
6 POOL SECTION VIEW C
1/4" = 1'-0"



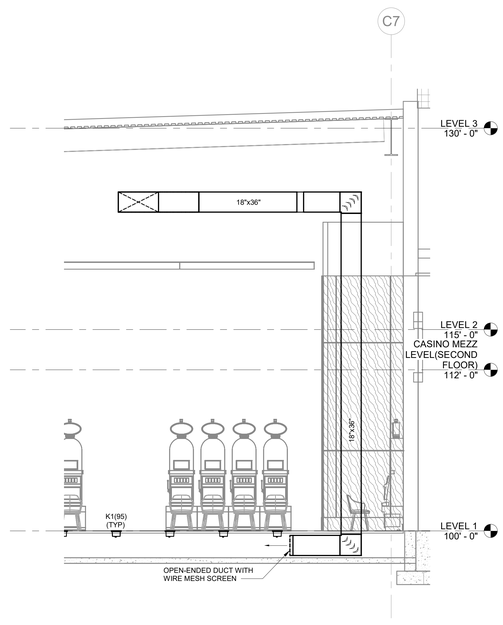
5 POOL SECTION VIEW B
1/4" = 1'-0"



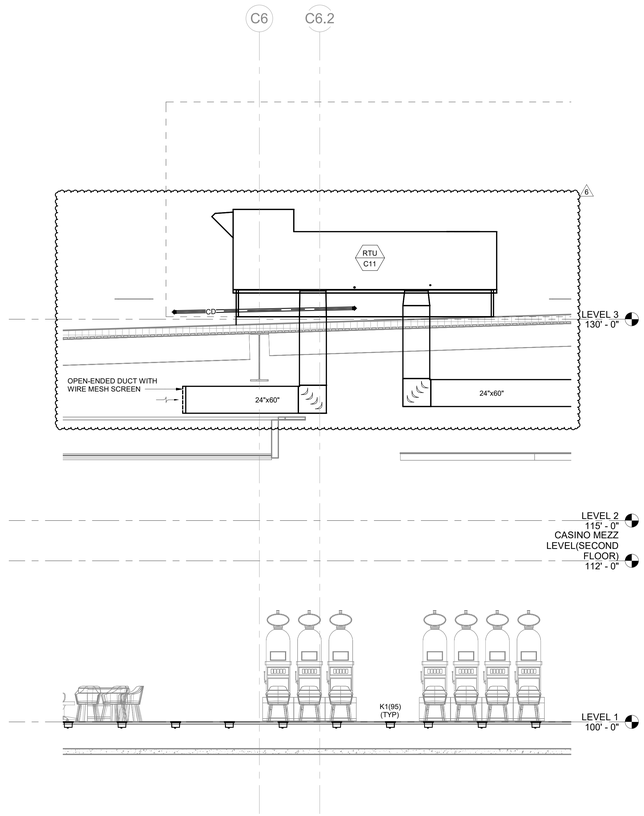
4 POOL SECTION VIEW A
1/4" = 1'-0"



3 TYPICAL MULTIPURPOSE ROOM AIR DISTRIBUTION
1/4" = 1'-0"



2 TYPICAL CASINO DUCT DROP
1/4" = 1'-0"



1 TYPICAL CASINO RTU DROP
1/4" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

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BULLETIN 02
03/15/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	1/4" = 1'-0"

REVISIONS

6	2023-0315	BULLETIN 02

HVAC SECTIONS

M-301

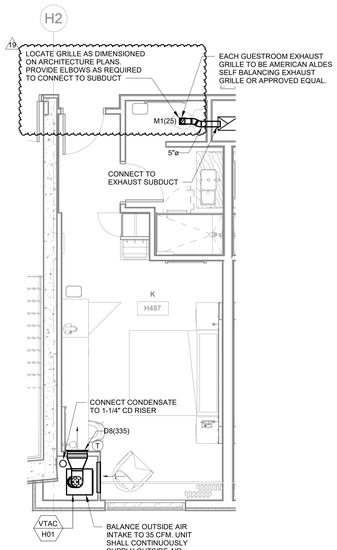
3/14/2023 10:38:08 AM DRAWING PRINTED FULL SIZE (30"H) - IN PAF DRAWING PRINTED HALF SIZE (15"H) WILL FIT ON A SHEET 15"H/2" WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED AS/ALT THIRD SIZE (10"H) = 1"=20'-0"/3"=1'-0" FOR SCALES AT 24", 36", 3/16" AND 1/32". VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY AND MAKING THE NUMERATOR 3. FOR EXAMPLE, 1/8"=1'-0" (1:12) FOR EXAMPLE, 1.5"=1'-0" (1:8) WILL BE SHARED TO 1/4"=1'-0".

790

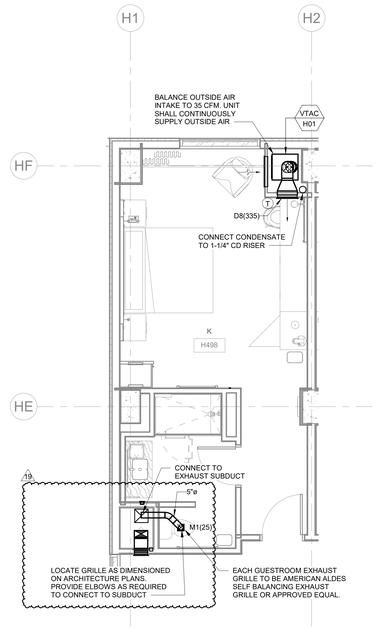
GENERAL NOTES:

A. HVAC LAYOUTS SHOWN ARE TYPICAL FOR STANDARD, HEARING IMPAIRED AND ADA UNITS.

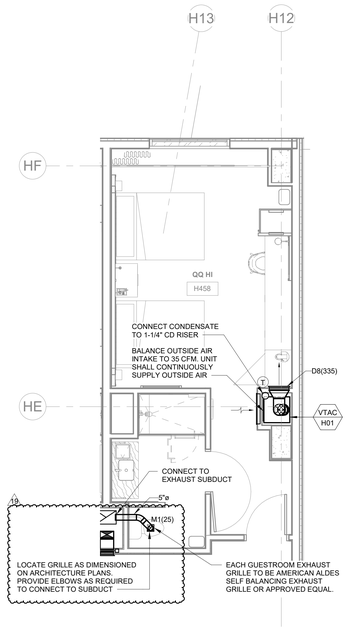
B. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING.



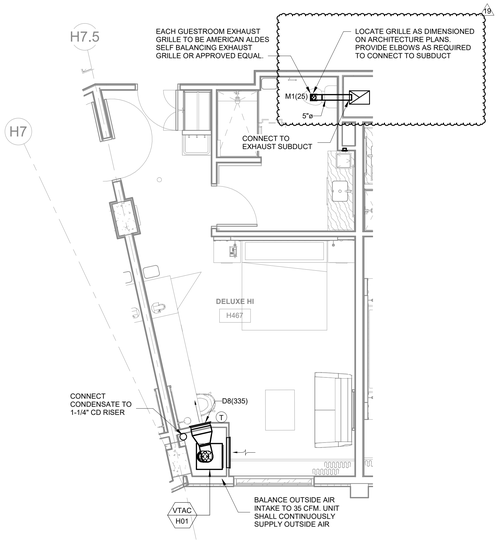
6 HVAC - ENLARGED HOTEL ROOM PLAN - TYPE K STAIR TOWER
1/4" = 1'-0"



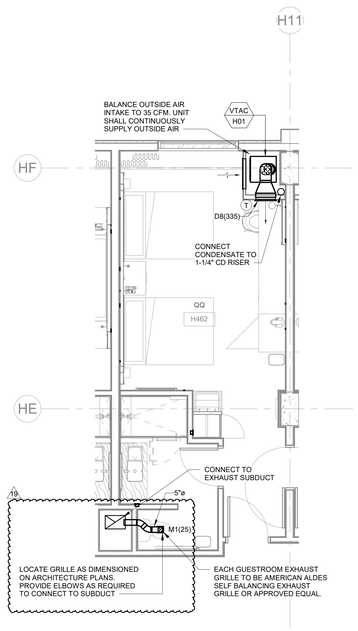
5 HVAC - ENLARGED HOTEL ROOM PLAN - TYPE K END ROOM
1/4" = 1'-0"



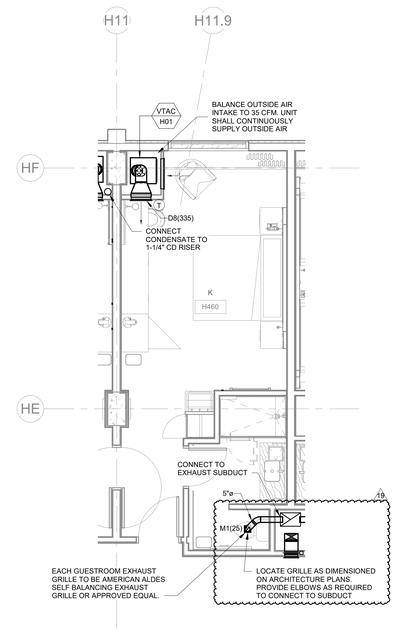
4 HVAC - ENLARGED HOTEL ROOM PLAN - TYPE QQ END ROOM
1/4" = 1'-0"



3 HVAC - ENLARGED HOTEL ROOM PLAN - TYPE K DEL
1/4" = 1'-0"



2 HVAC - ENLARGED HOTEL ROOM PLAN - TYPE QQ
1/4" = 1'-0"



1 HVAC - ENLARGED HOTEL ROOM PLAN - TYPE K
1/4" = 1'-0"

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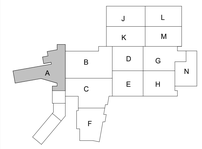
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KEY PLAN

BULLETIN 15
09/13/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	1/4" = 1'-0"

REVISIONS

15	2023-0628	BULLETIN 12
19	09/13/2023	BULLETIN 15

HVAC ENLARGED PLANS

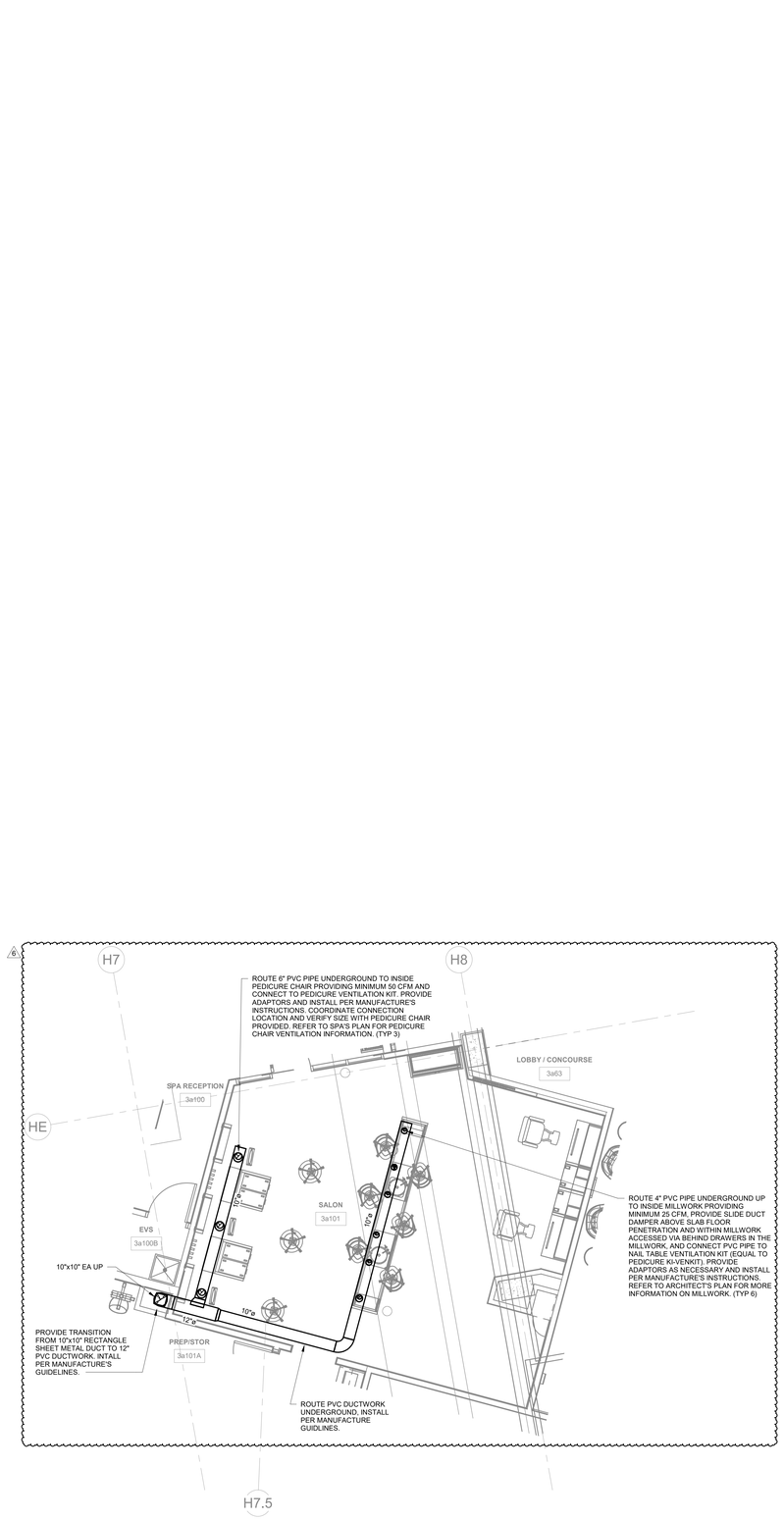
M-400

9/12/2023 1:23:31 PM
DRAWING PRINTED FULL SIZE (ISO) = 24"x36". DRAWING PRINTED HALF SIZE (ISO) = 12"x18". IF ITEM IS PART OF EXTERIOR ENCLOSURE ON ALL FOUR SIDES, DRAWING PRINTED ENTIRELY THREE SIZE (3" FILL IT SOLID) IF ALL 3 IT SOLID. IF ITEM IS PART OF EXTERIOR ENCLOSURE ON 3 SIDES, DRAWING PRINTED TWO SIZES (2" FILL IT SOLID) IF ALL 2 IT SOLID. IF ITEM IS PART OF EXTERIOR ENCLOSURE ON 1 SIDE, DRAWING PRINTED FULL SIZE (1" FILL IT SOLID) IF ALL 1 IT SOLID. THE DRAWING FOR EXAMPLE 1/8"=1'-0" (1:96) WILL BE SAME AS 1/4"=1'-0" FOR SCALES AT 24" X 36", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DRAWING FOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1.5X WILL BE 3/4"=1'-0" (1:72) WILL BE SAME AS 1"=1'-0"

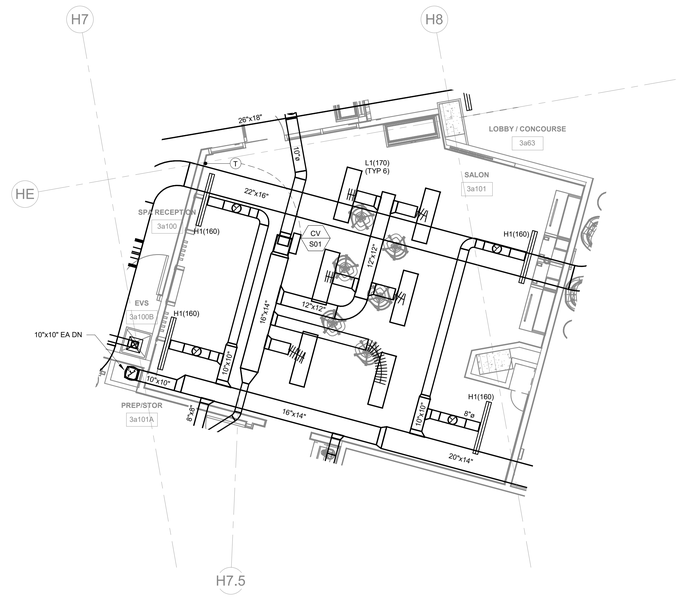
DRAWING PRINTED FULL SIZE (30IN) - IF NOT 30X42 PRINTED ON A2 SIZE (42IN) THEN IT'S ON A SHEET SPLIT WITH 1/3 OF EXTA SPACE ON ALL FOUR SIDES. DRAWING PRINTED NUMBER 7 WAS SIZE (37.5IN) THEN ALL SHOULD BE 3/4"=1'-0" FOR SCALES AT 3/4", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR ESSENTIALLY AND CHANGE THE NUMERATOR TO 1. 1/32ARE 3/4"=1'-0" AT (37.5IN) WILL BE SCALED TO 3/4"=1'-0".

3/14/2023 10:38:12 AM

790



1 HVAC - SPA ENLARGED PLAN - UNDERGROUND
1/4" = 1'-0"



2 HVAC - SPA ENLARGED PLAN
1/4" = 1'-0"

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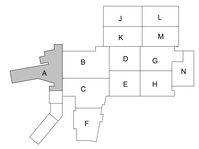
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KEY PLAN

BULLETIN 02
03/15/2023

ISSUE	02/14/2023
JOB	30611.00
DRAWN	MWM
SCALE	1/4" = 1'-0"

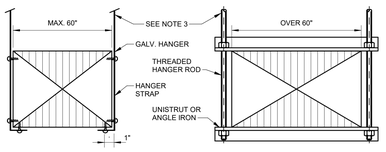
REVISIONS

5	2023-0214	BULLETIN 01
6	2023-0315	BULLETIN 02

HVAC ENLARGED PLANS

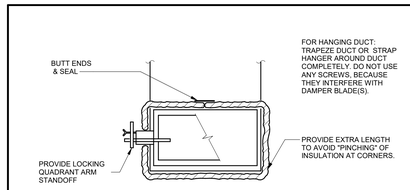
M-401

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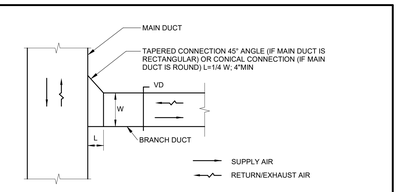


NOTES :
1. ON DUCTS OVER 48" WIDE, BOTTOM SHALL BE BRACED BY ANGLE. FOR CROSS SECTION AREA MORE THAN 8 SQ FT, DUCT SHALL BE BRACED BY ANGLES ON ALL FOUR SIDES.
2. CUTTING AND PATCHING SHALL BE LIMITED TO A MINIMUM AS REQUIRED FOR PROPER INSTALLATION.
3. SUPPORTS SHALL BE SPACED AND SIZED AS PER SMACNA.

1 DUCT HANGER SUPPORT
SCALE: NTS

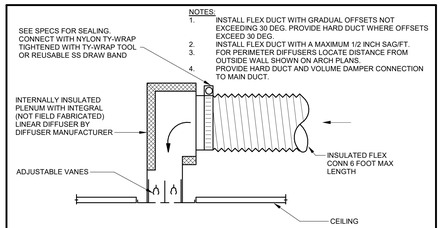


2 TYPICAL DUCT INSULATION & SUPPORTS NEAR VOLUME DAMPERS
SCALE:NTS

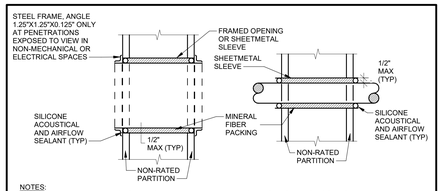


3 LOW PRESSURE BRANCH TAKE-OFFS
SCALE:NTS

NOTES:
1. INSTALL FLEX DUCT WITH GRADUAL OFFSETS NOT EXCEEDING 30 DEG. PROVIDE HARD DUCT WHERE OFFSETS EXCEED 30 DEG.
2. INSTALL FLEX DUCT WITH A MAXIMUM 1/2 INCH SAG/FT.
3. FOR PERIMETER DIFFUSERS LOCATE DISTANCE FROM OUTSIDE WALL SHOWN ON ARCH PLANS.
4. PROVIDE HARD DUCT AND VOLUME DAMPER CONNECTION TO MAIN DUCT.

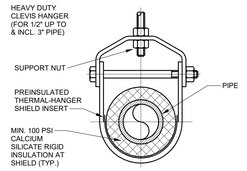


4 LINEAR SUPPLY DIFFUSER CONNECTION WITH LINED PLENUM
SCALE: NTS



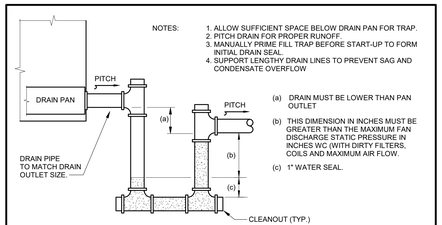
NOTES:
1. AT FIRE RATED PARTITIONS WITHOUT FIRE DAMPER, REPLACE PACKING AND SILICONE SEALANT WITH UL LISTED FIRE STOP SYSTEM. INSTALL IN ACCORDANCE WITH UL LISTING.
2. FIRE STOP DUCT PENETRATIONS THRU RATED AND NON-RATED CORRIDOR WALLS ABOVE CEILINGS.

5 DUCT PENETRATION OF FULL HEIGHT PARTITIONS
SCALE:NTS

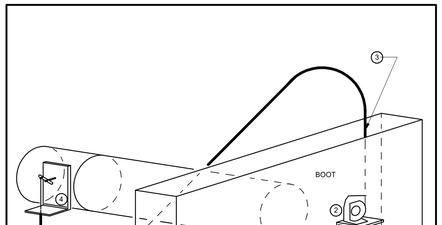


NOTES:
1. SEE SPECIFICATION FOR HANGER SIZES AND THERMAL HANGER SHIELD REQUIREMENTS.
2. MAINTAIN VAPOR BARRIER FOR CHILLED WATER SERVICE THROUGH THERMAL HANGER SHIELD.
3. SHIELD INSULATION THICKNESS SHALL MATCH SPECIFIED PIPE INSULATION THICKNESS.

6 PIPE HANGER SUPPORT
SCALE: NTS

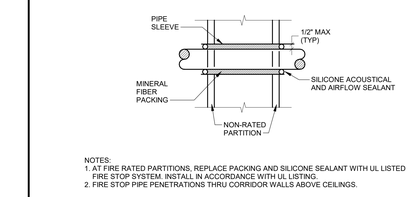


7 BLOW THROUGH UNIT CONDENSATE TRAP
SCALE: NTS



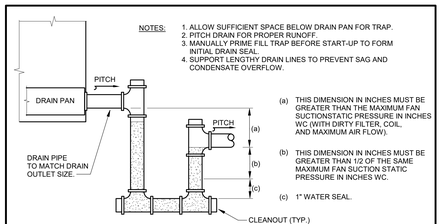
NOTES:
1. CABLE: 0.054" STAINLESS STEEL CONTROL WIRE IN 1'16" FLEXIBLE GALVANIZED SPIRAL SHEATH.
2. LOCKING RACK AND PINION GEAR DRIVE: 14 GAUGE STEEL SOCKET WRENCH OR PHILLIPS HEAD SCREWDRIVER OPERATED RIGLY FASTENED TO INERIOR OF BOOT.
3. PROVIDE PLASTIC ANTI-ABRASION GROMMET AT BOOT PENETRATION. HOLE DIAMETER PER OPERATOR'S INSTALLATION INSTRUCTIONS.
4. BALANCING DAMPER WITH CONTROL SHAFT AND DRIVEN END SUPPORT. MAKE RIGID CONNECTION TO DAMPER ASSEMBLY HOUSING.

11 LINEAR DIFFUSER WITH REMOTE CABLE OPERATED BALANCING DAMPER
SCALE:NTS

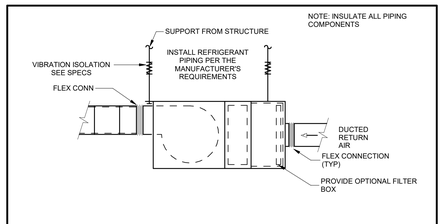


NOTES:
1. AT FIRE RATED PARTITIONS, REPLACE PACKING AND SILICONE SEALANT WITH UL LISTED FIRE STOP SYSTEM. INSTALL IN ACCORDANCE WITH UL LISTING.
2. FIRE STOP PIPE PENETRATIONS THRU CORRIDOR WALLS ABOVE CEILINGS.

8 PIPE PENETRATION OF FULL HEIGHT PARTITONS
SCALE:NTS



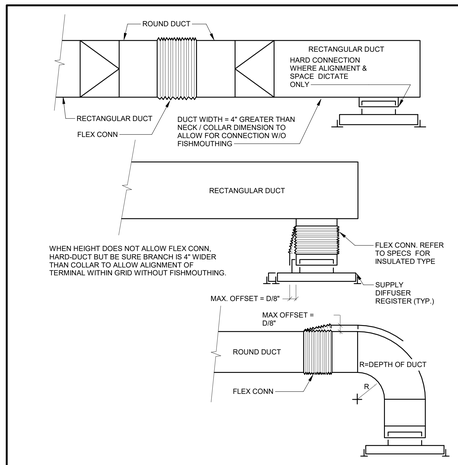
9 DRAW THROUGH UNIT CONDENSATE TRAP
SCALE: NTS

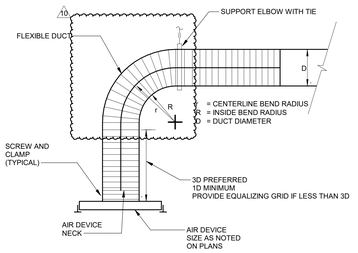


10 DUCTED FAN COIL CONNECTION DETAIL
SCALE: NTS

NOTES:
1. CABLE: 0.054" STAINLESS STEEL CONTROL WIRE IN 1'16" FLEXIBLE GALVANIZED SPIRAL SHEATH.
2. LOCKING RACK AND PINION GEAR DRIVE: 14 GAUGE STEEL SOCKET WRENCH OR PHILLIPS HEAD SCREWDRIVER OPERATED RIGLY FASTENED TO INERIOR OF BOOT.
3. PROVIDE PLASTIC ANTI-ABRASION GROMMET AT BOOT PENETRATION. HOLE DIAMETER PER OPERATOR'S INSTALLATION INSTRUCTIONS.
4. BALANCING DAMPER WITH CONTROL SHAFT AND DRIVEN END SUPPORT. MAKE RIGID CONNECTION TO DAMPER ASSEMBLY HOUSING.

11 LINEAR DIFFUSER WITH REMOTE CABLE OPERATED BALANCING DAMPER
SCALE:NTS





NOTES:
1. DETAIL ALLOWS DUCTWORK TO BE INSTALLED BEFORE CEILING GRID THEN ALLOWS DIFFUSERS AND REGISTERS TO BE POSITIONED INTO GRID.
2. PROVIDE INSULATED TRANSITION ROUND TO SQUARE INLET DIFFUSERS.
3. SECURE FLEXIBLE DUCT TO METAIL DUCT WITH (2) STAINLESS STEEL CLAMPS OR NYLON TY-WRAPS TO INDIVIDUALLY SECURE FLEXIBLE DUCT INNER SLEEVE AND OUTER SLEEVE. WHEN INSTALLED ON INSULATED SYSTEM SEAL INSULATION JOIN WITH VAPOR BARRIER MASTIC. PROVIDE NYLON TY-WRAP TOOL OR REUSABLE SS DRAW BANDS.
4. PROVIDE DUCT MOUNTED VOLUME DAMPER. AVOID NECK DAMPERS.
5. FLEXIBLE DUCTS SHALL BEND IN ONE DIRECTION ONLY WITH A MAXIMUM CHANGE IN DIFFERENCE OF 90 DEGREES.
6. UNLESS SHOWN OTHERWISE FLEXIBLE DUCT SIZE AND COLLAR OF TAP OFF SHALL BE SAME SIZE AS DIFFUSER NECK.
7. IF RUN-OUT LENGTH REQUIRES SEGMENT OF HARD DUCT, SIZE SHALL BE SAME AS DIFFUSER NECK. RUN-OUT TO DIFFUSER SHALL BE AS STRAIGHT AS POSSIBLE.
8. INSTALL BENDS IN FLEXIBLE DUCTS WITH MINIMUM CENTERLINE RADIUS EQUAL TO 1.5 DUCT DIAMETERS (r >= 1.5 x D)
9. DO NOT EXCEED 6'-0" MAXIMUM LENGTH OF FLEX DUCT RECOMMENDED IN THE 2017 ASHRAE FUNDAMENTALS HANDBOOK. INSTALL FLEX DUCT WITH NO MORE THAN 1/2" SAG PER FOOT.

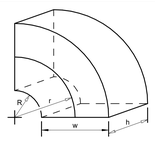
12 DIFFUSER/REGISTER DUCTWORK CONNECTIONS
SCALE: NTS

RADIUS ELBOW AND SPLITTER VANE REQUIREMENTS

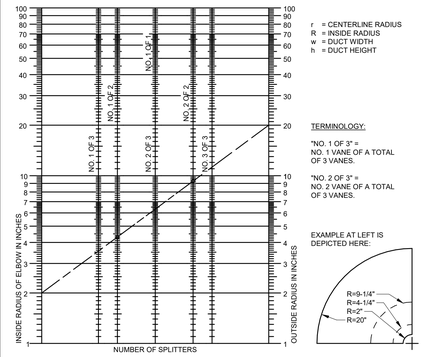
r/w RATIO:	NO. OF VANES FOR 1 ELBOW:	NO. OF VANES WHEN 2 ELBOWS ARE WITHIN 2 EQUIV. DIA.
r/w >= 1.50	0	1
1.5 > r/w >= 0.70	1	2
0.7 > r/w >= 0.60	2	3
0.6 > r/w >= 0.55	3	3

EQUIVALENT DIAMETER = (w+h)/2

NOTE: r/w = 0.5 IS A SQUARE THROAT ELBOW! HOWEVER, MINIMUM INSIDE RADIUS R SHOULD BE 2".



r = CENTERLINE RADIUS
R = INSIDE RADIUS
w = DUCT WIDTH
h = DUCT HEIGHT



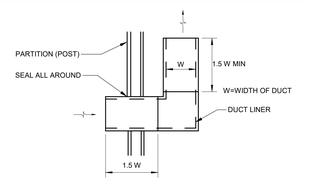
TERMINOLOGY:

"NO. 1 OF 3" = NO. 1 VANE OF A TOTAL OF 3 VANES.

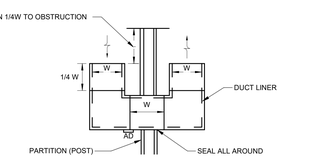
"NO. 2 OF 3" = NO. 2 VANE OF A TOTAL OF 3 VANES.

EXAMPLE AT LEFT IS DEPICTED HERE:

13 QUANTITY AND SPACING OF DUCT SPLITTER VANES
SCALE: NTS



NORMAL METHOD
PLAN VIEW



ALTERNATE
METHOD ELEVATION

NOTES:
1. DUCTWORK SHALL BE GALVANIZED SHEETMETAL WITH 1" FIBERGLASS ACOUSTICAL LINER OR FIBERGLASS-DUCTBOARD DUCT WITH MITERED RECTUANGULAR ELBOWS (NO VANES).
2. PROVIDE FIRE DAMPER AT FIRE RATED PARTITIONS.
3. SEE PLANS FOR SIZE AND LOCATION OF RETURN AIR TRANSFER DUCTS.
4. PROVIDE 1/2" X 1/2" WIRE MESH SCREEN AT OPEN ENDS OF DUCTS.

14 PLENUM TRANSFER DUCT
SCALE: NTS

Additions and Renovations to Harrah's Cherokee Valley River

777 Casino Parkway
Murphy, NC 28906

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120 HUYSHOPE AVENUE
SUITE 400
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BULLETIN 06
04/27/2023

NORTH CAROLINA PROFESSIONAL 039457 ENGINEER STEPHEN HAROLD DALTON
REGISTERED PROFESSIONAL ENGINEER
4/27/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	NTS

REVISIONS

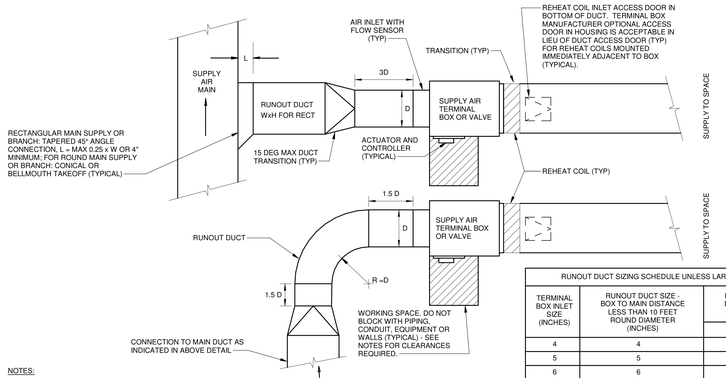
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HVAC DETAILS

M-501

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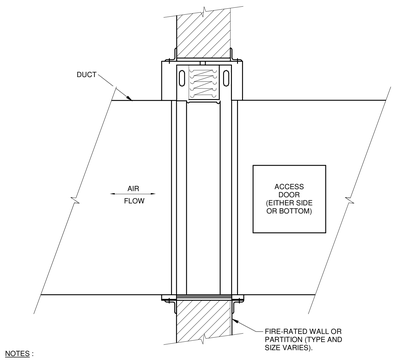


RUNOUT DUCT SIZING SCHEDULE UNLESS LARGER SIZE INDICATED ON PLANS			
TERMINAL BOX INLET SIZE (INCHES)	RUNOUT DUCT SIZE - BOX TO MAIN DISTANCE LESS THAN 10 FEET ROUND DIAMETER (INCHES)	RUNOUT DUCT SIZE - BOX TO MAIN DISTANCE GREATER THAN 10 FEET (INCHES)	
		WxH	ROUND DIAMETER
4	4	6x6	7
5	5	8x7	8
6	6	10x7	9
7	7	10x9	10
8	8	10x10	12
9	9	12x10	12
10	10	14x10	14
12	12	14x12	16
14	14	16x14	18
16	16	22x16	22
18	18	24x18	24

NOTES:

1. CONNECTIONS APPLY TO ALL TERMINAL BOXES INCLUSING THOSE WITHOUT REHEAT COILS OR WITHOUT SOUND ATTENUATORS. REFER TO PLANS AND SCHEDULES FOR REHEAT COIL AND SOUND ATTENUATOR REQUIREMENTS.
2. IF STRAIGHT RUN CANNOT BE MADE PROVIDE FLOW STRAIGHTENER AT BOX INLET.
3. PROVIDE RECTUANGULAR OR ROUND TO OVAL TRANSITIONS WHEN BOX INLET IS OVAL.
4. WORKING SPACE SHALL BE 36 INCHES MINIMUM FOR UP TO 150V TO 48 INCHES MINIMUM FOR 151V TO 600V FROM THE FACE OF THE CONTROLLER ENCLOSURE AS DEFINED IN THE NATIONAL ELECTRIC CODE 110.26(A)(4) FOR LIMITED ACCESS. A HORIZONTAL, STRUCTURAL MEMBER OR ACCESS PANEL IS PERMITED WITHIN THIS 36 INCH DIMENSION. WIDTH OF ACCESS ZONE SHALL MATCH WIDTH OF CONTROLLER PANEL COVER BUT NO LESS THAN 30 INCHES. WHEN LOCATED ABOVE A CEILING THE MINIMUM ACCESS AREA THROUGH THE CEILING SHALL BE 22 INCHES BY 22 INCHES.

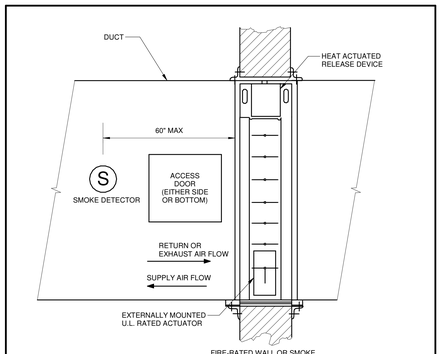
1 SUPPLY AIR TERMINAL BOX AND VALVE - DUCT CONNECTIONS
SCALE:NTS



NOTES :

1. DAMPER BLADES SHALL BE OUT OF AIRSTREAM TYPE "3A,3B,7 OR 8" (SEE SMACNA FIRE DAMPER AND HEAT STOP GUIDE - 2ND EDITION PAGE 9 OR NEWER VERSION IF APPLICABLE) WHEN OPEN 100% FREE AREA IS REQUIRED. WHEN DUCT DIMENSIONS REQUIRE MULTIPLE DAMPER SECTIONS, TYPE "2" MAY BE USED.
2. PROVIDE SPRING LOADED CLOSURE FOR ALL FIRE DAMPERS.
3. WHEN DUCTWORK IS INSULATED OR LINED, PROVIDE INSULATED ACCESS DOOR.
4. WHERE DUCT SIZE PERMITS AND DAMPERS CAN BE REACHED BY AN ORDINARY PERSON'S ARM TO RESET THE FUSIBLE LINK, ACCESS DOORS SHALL BE MINIMUM 18" X 16" PER NFPA 90A. FOR LARGE DAMPERS AND WHERE ACCESS DOOR LOCATION REQUIRES A PERSON TO ENTER THE DUCT TO RESET THE FUSIBLE LINK, ACCESS DOOR SHALL BE 24" X16" MINIMUM. FOR SMALLER DUCTS PROVIDE THE LARGEST ACCESS DOOR POSSIBLE WITH A MINIMUM OF 12" X 12" PER NFPA 80. WHERE DUCT SIZE DOES NOT ALLOW INSTALLATION OF A 12" X 12" ACCESS DOOR, PROVIDE A 24" LONG REMOVABLE DUCT SECTION IN ADDITION TO A 6"X6" VIEW ONLY ACCESS DOOR FOR INSPECTION.
5. TYPE "1" FIRE DAMPERS (BLADES IN AIR STREAM) MAY BE SUBSTITUTED FOR TYPE "3A OR 3B" WHERE VELOCITIES ARE UNDER 500 FPM IN LOW PRESSURE DUCT SYSTEMS ONLY.
6. INSTALLATION SHOWN AS AN EXAMPLE. SPECIFIC INSTALLATION SHALL CONFORM WITH MANUFACTURER, UL APPROVED INSTRUCTIONS.

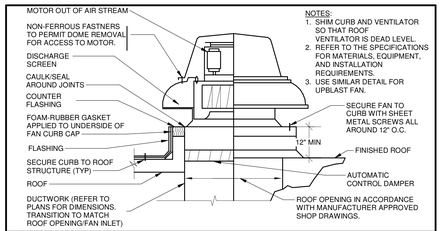
2 FIRE DAMPER PENETRATION
SCALE: NTS



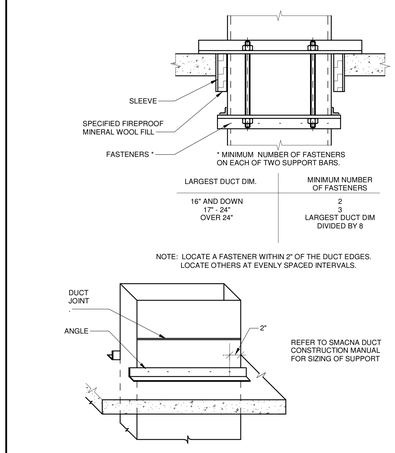
NOTES :

1. WHEN DUCTWORK IS INSULATED OR LINED, PROVIDE INSULATED ACCESS DOOR.
2. WHERE DUCT SIZE PERMITS AND DAMPERS CAN BE REACHED BY AN ORDINARY PERSON'S ARM TO RESET THE HEAT ACTUATED RELEASE DEVICE, ACCESS DOORS SHALL BE MINIMUM 18" X 16" PER NFPA 90A. FOR LARGE DAMPERS AND WHERE ACCESS DOOR LOCATION REQUIRES A PERSON TO ENTER THE DUCT TO RESET THE FUSIBLE LINK, ACCESS DOOR SHALL BE 24" X16" MINIMUM. FOR SMALLER DUCTS PROVIDE THE LARGEST ACCESS DOOR POSSIBLE WITH A MINIMUM OF 12" X 12" PER NFPA 80. WHERE DUCT SIZE DOES NOT ALLOW INSTALLATION OF A 12" X 12" ACCESS DOOR, PROVIDE A 24" LONG REMOVABLE DUCT SECTION IN ADDITION TO A 6"X6" VIEW ONLY ACCESS DOOR FOR INSPECTION.
3. INSTALLATION SHOWN AS AN EXAMPLE. SPECIFIC INSTALLATION SHALL CONFORM WITH MANUFACTURER, UL APPROVED INSTRUCTIONS.

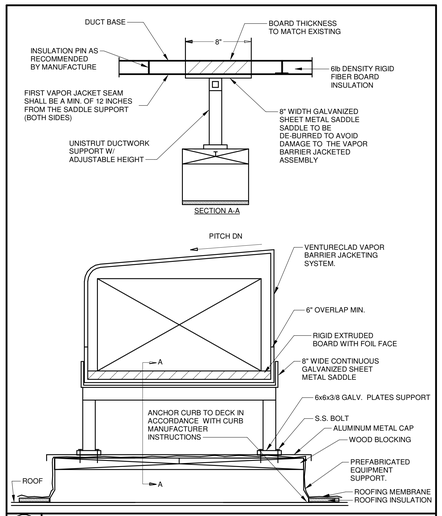
3 SMOKE AND SMOKE/FIRE DAMPER
SCALE: NTS



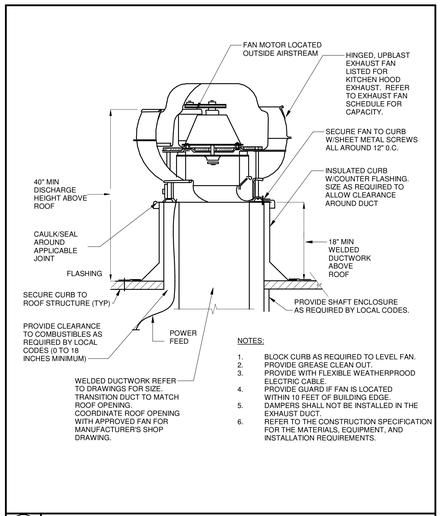
4 ROOF-MOUNTED MUSHROOM STYLE EXHAUST FAN
SCALE: NTS



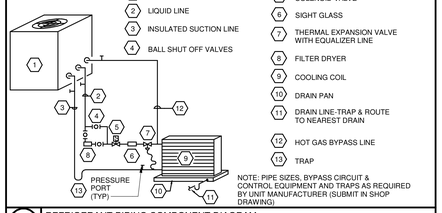
6 DUCT RISER SUPPORTS-FROM FLOOR
SCALE: NTS



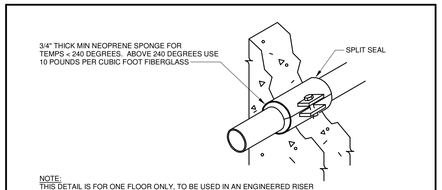
7 EXTERIOR DUCTWORK SUPPORT AND INSULATION
SCALE: NTS



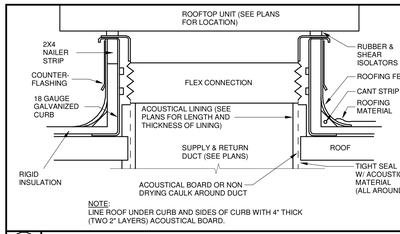
8 ROOF-MOUNTED KITCHEN EXHAUST FAN
SCALE:NTS



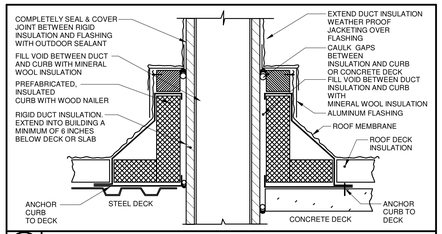
5 REFRIGERANT PIPING COMPONENT DIAGRAM
SCALE: NTS



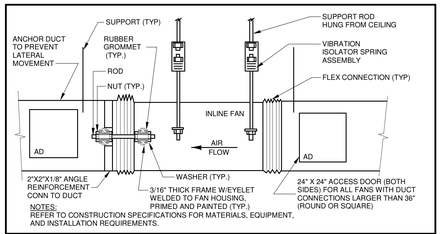
9 ACOUSTICAL FLOOR, CEILING & WALL PIPE SEAL
SCALE: NTS



10 ROOFTOP UNIT MOUNTING W/CURB
SCALE: NTS



11 INSULATED DUCT PENETRATION THROUGH ROOF
SCALE: NTS



12 INLINE FAN
SCALE: NTS

Additions and Renovations to Harrah's Cherokee Valley River

777 Casino Parkway
Murphy, NC 28906

JCJARCHITECTURE
120 HUYSHOPE AVENUE
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HARTFORD, CT 06106
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01/31/2023

NORTH CAROLINA PROFESSIONAL 039457 ENGINEER EDWARD DALTON
1/30/2023

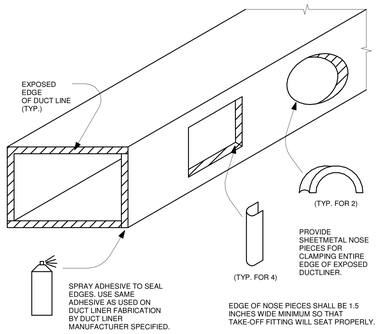
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REVISIONS	

HVAC DETAILS

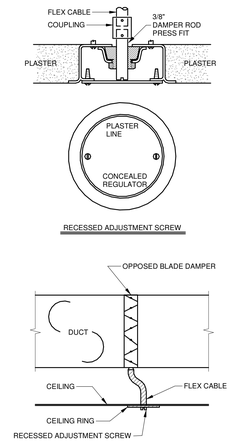
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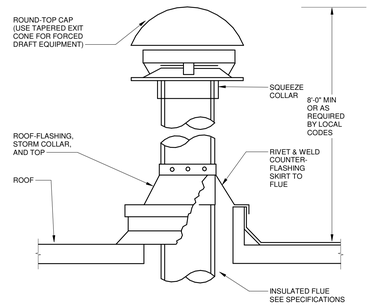
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1 SEALING AND SECURING EXPOSED DUCTLINER
SCALE: NTS

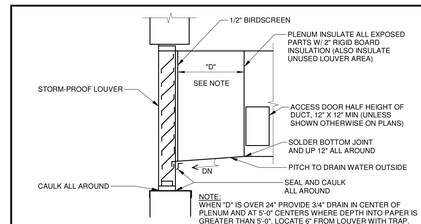


2 REMOTE ADJUSTABLE BALANCING DAMPER
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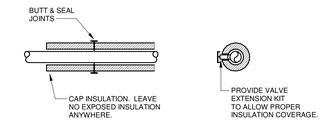


NOTES:
1. PROVIDE NECESSARY GUYING (3) LOCATIONS MINIMUM TO STRUCTURAL STEEL AND SUPPORTS AS REQUIRED BY FLUE HEIGHT.
2. CURB ROOFING AND FLASHING BY GC.
3. SEE SPECIFICATIONS FOR OTHER REQUIREMENTS.
4. FOR FORCED DRAFT EQUIPMENT, PROVIDE DRAIN TEE AT BOTTOM OF VERTICAL RISER. PIPE DRAIN WITH TRAP TO NEAREST FLOOR DRAIN.

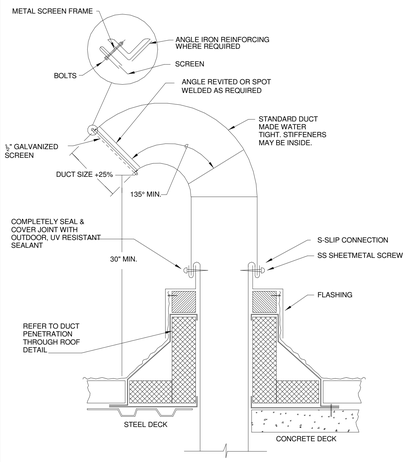
3 GRAVITY GAS VENT THRU ROOF
SCALE:NTS



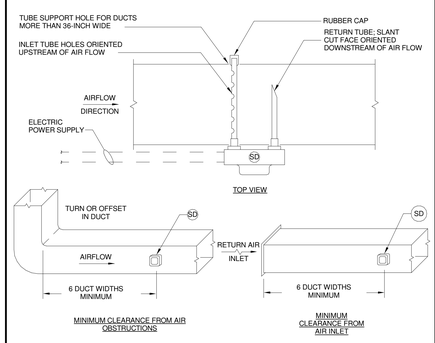
4 LOUVER CONNECTION
SCALE: NTS



5 TYPICAL PIPE INSULATION & VALVE HANDLE EXTENSION
SCALE: NTS

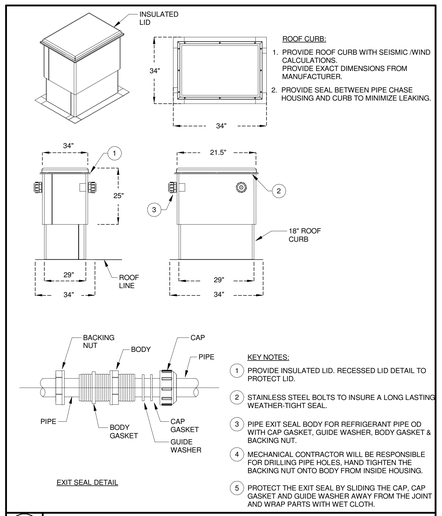


6 GOOSENECK DETAIL (ROOF MOUNTED)
SCALE: NTS

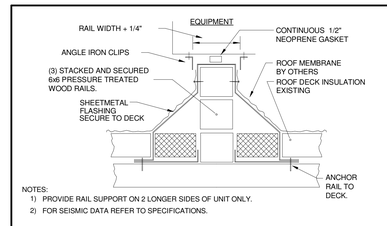


NOTE:
1. INLET TUBE LENGTH SHALL BE EQUAL TO FULL WIDTH OF DUCT.
2. RETURN TUBE SHALL BE AS RECOMMENDED BY THE DETECTOR'S MANUFACTURER.
3. CLEARANCES FROM OBSTRUCTIONS, INLETS AND PROPER LOCATION IN THE SYSTEM SHALL BE IN ACCORDANCE WITH NEMA: "GUIDE FOR PROPER USE OF SMOKE DETECTORS IN DUCT APPLICATIONS", NFPA 90A U.L. STANDARD 268A AND NFPA 72E.

7 DUCT SMOKE DETECTOR DETAIL
SCALE: NTS



8 PIPING PENETRATION DETAIL (MANUFACTURED PITCH POCKET)
SCALE: NTS



NOTES:
1) PROVIDE RAIL SUPPORT ON 2 LONGER SIDES OF UNIT ONLY.
2) FOR SEISMIC DATA REFER TO SPECIFICATIONS.

9 ROOF MOUNTED EQUIPMENT CURB RAIL SUPPORT DETAIL
SCALE: NTS

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039457 EDWARD DALTON
1/30/2023

ISSUE	12/22/2022
JOB	30611.00
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SCALE	12" = 1'-0"
REVISIONS	

HVAC DETAILS

M-503

1/30/2023 11:20:18 AM
DRAWING PRINTED FULL SIZE (18"h) - IN PAPF DRAWING PRINTED HALF SIZE (9"h) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED EQUAL TO MEASURE 24" BY 36" 1/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1 EXAMPLE 3/16"=1'-0" (0.375) WILL BE SAME AS 1"=1'-0" (0.375) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES EXAMPLE 1/8"=1'-0" (0.250) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED HALF SIZE (9"h) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED FULL SIZE (18"h) - IN PAPF DRAWING PRINTED HALF SIZE (9"h) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES EXAMPLE 1/8"=1'-0" (0.250) WILL BE SAME AS 1"=1'-0" (0.375) WILL BE SAME AS 1"=1'-0" (0.375) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES EXAMPLE 3/16"=1'-0" (0.375) WILL BE SAME AS 1"=1'-0" (0.375) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED FULL SIZE (18"h) - IN PAPF DRAWING PRINTED HALF SIZE (9"h) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED EQUAL TO MEASURE 24" BY 36" 1/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1 EXAMPLE 3/16"=1'-0" (0.375) WILL BE SAME AS 1"=1'-0" (0.375) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES EXAMPLE 1/8"=1'-0" (0.250) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED HALF SIZE (9"h) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED FULL SIZE (18"h) - IN PAPF DRAWING PRINTED HALF SIZE (9"h) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES EXAMPLE 1/8"=1'-0" (0.250) WILL BE SAME AS 1"=1'-0" (0.375) WILL BE SAME AS 1"=1'-0" (0.375) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES EXAMPLE 3/16"=1'-0" (0.375) WILL BE SAME AS 1"=1'-0" (0.375) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED FULL SIZE (18"h) - IN PAPF DRAWING PRINTED HALF SIZE (9"h) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED EQUAL TO MEASURE 24" BY 36" 1/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1 EXAMPLE 3/16"=1'-0" (0.375) WILL BE SAME AS 1"=1'-0" (0.375) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES EXAMPLE 1/8"=1'-0" (0.250) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED HALF SIZE (9"h) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED FULL SIZE (18"h) - IN PAPF DRAWING PRINTED HALF SIZE (9"h) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES EXAMPLE 1/8"=1'-0" (0.250) WILL BE SAME AS 1"=1'-0" (0.375) WILL BE SAME AS 1"=1'-0" (0.375) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES EXAMPLE 3/16"=1'-0" (0.375) WILL BE SAME AS 1"=1'-0" (0.375) WILL FIT ON A SHEET 9" IN PAPF WITH 1.0" OF EXTRA SPACE ON ALL FOUR SIDES

DRAWING PRINTED FULL SIZE (ISO A1) - IF NOT 2000MM LONG PRINTED HALF SIZE (ISO A2) - DO NOT SCALE DRAWING PRINTED MANUALLY - THIRD SIZE (27.5%) = 11.21x15.75" WILL FIT TIGHTLY ON A 11"x17" - INDIVIDUAL 12", 24", 6", 18" AND 120" VIEW SCALES WILL TYPICALLY BE WHOLE PERCENTAGES BY WHICH THE NUMBER ON 3 1/2 EXAMPLE IS BY WHICH THE DRAWING IS TO BE PRINTED TO 11"x17"

3/14/2023 10:38:20 AM

CASINO HVAC - AIR HANDLING UNIT (DIRECT EXPANSION COOLING AND GAS HEAT)

REMARKS:
1. PROVIDE SINGLE POINT POWER CONNECTION OF 460/3/60 FOR UNIT.
2. PROVIDE VARIABLE FREQUENCY DRIVE & DISCONNECT SWITCH.
3. PROVIDE WITH MANUFACTURER'S 18" ROOF CURB.
4. PROVIDE BACNET MSTP INTERFACE.
5. PROVIDE CLASS 1 MODULATING OUTSIDE AND RETURN DAMPER WITH 0%-100% ECONOMIZER CONTROL.
6. PROVIDE STAINLESS STEEL OR NON CORROSIVE DRAIN PAN.
7. PROVIDE INTAKE & EXHAUST WEATHERHOOD BY EQUIPMENT MANUFACTURER.
8. PROVIDE PREMIUM EFFICIENCY MOTORS.
9. PROVIDE WITH RETURN SMOKE DETECTOR ALL RTU'S OVER 2,000 CFM.
10. PROVIDE WITH ION GENERATOR EQUAL TO PHENOMENAL AIRE C-10. ION GENERATOR SHALL BE FIELD INSTALLED BY CONTRACTOR IN RETURN DUCT PRIOR TO UNIT CONNECTION.
11. PROVIDE WITH MODULATING HOT GAS REHEAT.
12. PROVIDE WITH VIBRATION ISOLATION RAILS.
13. PROVIDE WITH MODULATING PROPANE GAS FURNACE.
14. LEAD COMPRESSOR SHALL BE DIGITAL SCROLL.

UNIT NUMBER	SERVICE	LOCATION	TOTAL (CFM)	OUTDOOR AIR				SUPPLY FAN DATA					EXHAUST/RETURN FAN DATA				COOLING COIL DATA					COMPRESSORS			HEATING COIL DATA				ELECTRICAL DATA							WEIGHT (LBS.)	(AS STANDARD)		REMARKS
				MIN. (CFM)	SUMMER (DEG F)		WINTER (DEG F)	CAPACITY CONTROL		ESP (IN WG)	RPM	BHP	MOTOR QTY	MOTOR HP	AIRFLOW (CFM)	ESP (IN WG)	RPM	HP	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	FACE VELOCITY (FPM)	REFRIG. TYPE	AIR DATA				TYPE	QTY	EER @ AHRI	INPUT (MBH)	OUTPUT (MBH)	EAT (DEG F)	LAT (DEG F)	V	P	H	FLA	MCA	MOCP	LR, STBY, OR N POWER		MANUFACTURER	MODEL	
					DB	WB	DB	RANGE	TYPE													EAT (DEG F) DB	EAT (DEG F) WB	LAT (DEG F) DB	LAT (DEG F) WB															
RTU-C01	CASINO BOH 1ST LEVEL	CASINO ROOF	6,500	1,440	90.5	73.6	16.1	30-100%	VFD	2.5	1,544	6.3	1	7.5	6,500	1.0	1800	2	315.0	210.9	260	R410A	80.0	65.3	48.5	47.7	SCROLL	3	9.9	300.0	243.0	58	94	460	3	60	69.7	75.5	90	N	5800	DAIKIN	MPS030F	1 - 10, 12 - 14
RTU-C02	CASINO BOH 1ST LEVEL	CASINO ROOF	8,400	1,915	90.5	73.6	16.1	30-100%	VFD	2.4	1,633	7.4	1	40	8,400	1.0	1800	2	334.9	240.8	330	R410A	80.1	65.4	52.3	51.5	SCROLL	3	9.9	300.0	243.0	58	86	460	3	60	73	78.8	100	STBY	5800	DAIKIN	MPS030F	1 - 10, 12 - 14
RTU-C03	CASINO BOH 2ND LEVEL	CASINO ROOF	9,700	2,900	90.5	73.6	16.1	30-100%	VFD	2.0	1,677	7.8	1	10	9,700	1.0	1800	2	372.3	267.0	380	R410A	81.0	66.2	54.0	53.2	SCROLL	3	9.8	300.0	243.0	54	79	460	3	60	78.5	84.3	100	N	6100	DAIKIN	MPS035F	1 - 10, 12 - 14
RTU-C04	CASINO BAR	CASINO ROOF	3,800	1,630	90.5	73.6	16.1	30-100%	VFD	1.0	1,693	1.67	1	8	3,800	0.8	2707	4	174.5	119.7	250	R410A	82.8	67.6	52.3	52.3	SCROLL	2	10.8	300.0	240.0	51	113	460	3	60	34	37.2	50	STBY	4000	DAIKIN	DPS015A	1 - 11, 13, 14
RTU-C05	CASINO CONNECTOR	CASINO ROOF	6,400	1,050	90.5	73.6	16.1	30-100%	VFD	1.5	1,677	3.34	2	2.2	6,400	0.8	1152	5.3	257.6	189.9	330	R410A	79.2	64.6	50.4	50.4	SCROLL	3	10.7	400.0	324.0	61	108	460	3	60	62	67.8	80	STBY	8700	DAIKIN	DPSA020	1 - 11, 13, 14

CASINO HOTEL HVAC - AIR HANDLING UNIT (DIRECT EXPANSION COOLING AND GAS HEAT AND TOTAL ENERGY WHEEL)

REMARKS:
1. PROVIDE SINGLE POINT POWER CONNECTION OF 460/3/60 FOR UNIT.
2. PROVIDE VARIABLE FREQUENCY DRIVE & DISCONNECT SWITCH.
3. PROVIDE WITH MANUFACTURER'S 18" ROOF CURB.
4. PROVIDE BACNET MSTP INTERFACE.
5. PROVIDE CLASS 1 MODULATING OUTSIDE AND RETURN DAMPER WITH ECONOMIZER CONTROL.
6. PROVIDE STAINLESS STEEL OR NON CORROSIVE DRAIN PAN.
7. PROVIDE INTAKE & EXHAUST WEATHERHOOD BY EQUIPMENT MANUFACTURER.
8. PROVIDE PREMIUM EFFICIENCY MOTORS.
9. PROVIDE WITH RETURN SMOKE DETECTOR ALL RTU'S OVER 2,000 CFM.
10. PROVIDE WITH ION GENERATOR EQUAL TO PHENOMENAL AIRE C-10. ION GENERATOR SHALL BE FIELD INSTALLED BY CONTRACTOR IN RETURN DUCT PRIOR TO UNIT CONNECTION. PROVIDE SPACE PARTICULATE COUNTER AND VOC SENSOR, INSTALL NEXT TO THERMOSTAT/CO2 SENSOR.
11. PROVIDE WITH MODULATING HOT GAS REHEAT.
12. PROVIDE MODULATING TOTAL ENERGY RECOVERY WHEEL.
13. PROVIDE WITH VIBRATION ISOLATION RAILS.
14. PROVIDE WITH MODULATING PROPANE GAS FURNACE.
15. LEAD COMPRESSOR SHALL BE DIGITAL SCROLL.
16. TWO COMPRESSOR CIRCUITS SHALL BE DIGITAL SCROLL.

UNIT NUMBER		SERVICE	LOCATION	TOTAL (CFM)	OUTDOOR AIR				SUPPLY FAN DATA					EXHAUST FAN DATA					COOLING COIL DATA							HEATING COIL DATA			
BEGIN	END				MIN. (CFM)	SUMMER (DEG F)		WINTER (DEG F)	CAPACITY CONTROL	ESP (IN WG)	RPM	BHP	MOTOR QTY	MOTOR HP	AIRFLOW (CFM)	ESP (IN WG)	RPM	MOTOR QTY	HP	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	FACE VELOCITY (FPM)	REFRIG. TYPE	AIR DATA				INPUT (MBH)	OUTPUT (MBH)	EAT (DEG F)	LAT (DEG F)
					DB	WB	DB	RANGE	TYPE														EAT (DEG F) DB	EAT (DEG F) WB	LAT (DEG F) DB	LAT (DEG F) WB				
CASINO HOTEL RTU-C06	RTU-C13	POKER / GAMING	CASINO ROOF	11,000	3,850	90.5	73.6	16.1	30-100%	VFD	1.6	1,899	11.3	1	15	4,013	1.0	1800	1	8	371.9	335.3	430	R410A	83.7	64.7	54.2	53.0	300.0	243.0	64.5	86.3
ERV-H01	ERV-H01	HOTEL CORRIDORS & BOH	HOTEL ROOF	8,255	8,255	90.5	73.6	16.1	100%	CV	2.5	2,282	7.5	2	5.2	6,800	1.5	1351	1	7	427.8	285.8	230	R410A	86.3	69.5	52.4	52.4	400.0	324.0	49.0	85.0
ERV-H02	ERV-H02	HOTEL PODIUM	HOTEL LOW ROOF	13,500	13,500	90.5	73.6	16.1	30-100%	VFD	2.8	1,379	20.5	2	11.6	11,950	2.6	1756	2	7.3	624.7	416.4	380	R410A	84.8	69.6	54.9	54.9	400.0	324.0	47.0	69.0
ERV-H03	ERV-H03	RESTAURANT	HOTEL ROOF	4,760	4,760	90.5	73.6	16.1	30-100%	VFD	2.5	1,879	3.9	2	2.9	3,385	2.0	1416	2	2.2	262.5	154.0	290	R410A	82.1	69.1	50.7	50.7	200.0	162.0	46.0	78.0

CASINO HOTEL HVAC - AIR HANDLING UNIT (DIRECT EXPANSION COOLING AND GAS HEAT AND TOTAL ENERGY WHEEL) (CONT.)

UNIT NUMBER		TOTAL ENERGY WHEEL																COMPRESSORS			FILTER DATA		ELECTRICAL DATA							WEIGHT (LBS.)	(AS STANDARD)		REMARKS
BEGIN	END	OUTDOOR AIRFLOW (CFM)	EXHAUST AIRFLOW (CFM)	SUMMER DATA (PEAK LATENT LOAD)								WINTER DATA																				
				TOTAL CAPACITY (MBH)	EFFICIENCY (%)	EXHAUST AIR				SUPPLY AIR				TOTAL CAPACITY (MBH)	EFFICIENCY (%)	EXHAUST AIR				SUPPLY AIR														
						EAT (DEG F)		LAT (DEG F)		EAT (DEG F)		LAT (DEG F)				EAT (DEG F)		LAT (DEG F)		EAT (DEG F)		LAT (DEG F)										
						DB	WB	DB	WB	DB	WB	DB	WB			DB	WB	DB	WB	DB	WB	DB	WB	TYPE	QTY	EER	PRE FILTER	FINAL FILTER	V	P	H	FLA	MCA	MOCP	LR, STBY, OR N POWER		MANUFACTURER	MODEL	
CASINO HOTEL RTU-C06	RTU-C13	3,850	3,500	91.6	73	83.0	63.5	88.7	71.8	90.5	73.6	85.0	67.0	192.7	76	70.0	53.0	28.2	25.3	16.1	15.0	54.4	43.7	SCROLL	3	9.8	8	13	460	3	60	85.7	91.5	110	STBY	8000	DAIKIN	MPS035F	1 - 12, 14, 15
ERV-H01	ERV-H01	8,255	6,800	129.9	57	83.0	63.5	88.7	70.6	90.5	73.6	86.3	69.5	348.8	68	70.0	53.0	28.3	27.4	16.1	15.0	47.7	39.4	SCROLL	3	10.4	8	13	460	3	60	85.7	95.2	110	N	10900	DAIKIN	DPSA035	1 - 9, 11 - 14, 16
ERV-H02	ERV-H02	13,500	11,950	209.8	49	79.5	63.0	86.3	70.0	90.5	73.6	84.8	69.6	551.9	62	70.0	53.0	30.6	30.4	16.1	15.0	46.4	38.5	SCROLL	4	9.9	8	13	460	3	60	131.4	146	150	N	9710	DAIKIN	DPSA052	1 - 9, 11 - 14, 16
ERV-H03	ERV-H03	4,760	3,385	84.0	72	75.0	64.0	86.3	70.0	90.8	73.6	82.1	69.1	197.8	78	70.0	53.0	30.2	29.6	16.1	15.0	46.2	38.8	SCROLL	3	10.7	8	13	460	3	60	57.8	64.2	80	N	10220	DAIKIN	DPSA020	1 - 9, 11 - 15

HVAC - POOL DEHUMIDIFICATION AIR HANDLING UNIT

REMARKS:
1. PROVIDE SINGLE POINT POWER CONNECTION OF 460/3/60 FOR UNIT.
2. PROVIDE VARIABLE FREQUENCY DRIVE & DISCONNECT SWITCH.
3. PROVIDE WITH MANUFACTURER'S 18" ROOF CURB.
4. PROVIDE BACNET MSTP INTERFACE. SEE SPECIFICATIONS FOR CONTROL SEQUENCE.
5. PROVIDE STAINLESS STEEL OR NON CORROSIVE DRAIN PAN.
6. PROVIDE INTAKE & EXHAUST WEATHERHOOD BY EQUIPMENT MANUFACTURER AS APPLICABLE.
7. PROVIDE PREMIUM EFFICIENCY MOTORS.
8. PROVIDE WITH RETURN SMOKE DETECTOR ALL RTU'S OVER 2,000 CFM.
9. PROVIDE WITH INTEGRAL 3/4 HP GLYCOL PUMP.

UNIT NUMBER	SERVICE	LOCATION	TOTAL AIRFLOW (CFM)	OUTDOOR AIRFLOW (CFM)	SUPPLY FAN DATA				EXHAUST FAN DATA				COOLING DATA						COMPRESSOR DATA		HEATING COIL DATA		POOL HEATING			ELECTRICAL DATA						WEIGHT (LBS.)	(AS STANDARD)		REMARKS
					ESP (IN WG)	TYPE	MOTOR QTY	MOTOR HP	AIRFLOW (CFM)	ESP (IN WG)	MOTOR QTY	HP	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	FACE VELOCITY (FPM)	REFRIG. TYPE	EAT		QUANTITY	TYPE	INPUT (MBH)	OUTPUT (MBH)	TYPE	CAPACITY (MBH)	FLOW (GPM)	V	P	H	FLA	MCA	MOCP		MANUFACTURER	MODEL	
																	DB	WB																
HOTEL AHU-H01	POOL	HOTEL LOW ROOF	10,000	2,640	1.5	PLENUM	1	15	2,904	0.3	2	3.2	294.7	154.1	500	R410A	86.0	74.9	2	SCROLL	500.0	400.0	TITANIUM PLATE	204	36	460	3	60	71	77	90	10500	POOLPAK	PPK-080-GB-X	1 - 9

HVAC - POOL REMOTE DRY COOLER

REMARKS:
1. PROVIDE WITH ELECTRICAL DISCONNECT.
2. UNITS TO BE MOUNTED ON CURB RAILINGS. SEE DETAILS FOR ADDITIONAL INFORMATION.
3. 2" FLANGED PIPE CONNECTIONS.

UNIT NUMBER	SERVICE	LOCATION	COOLING DATA		MOTOR DATA		ELECTRICAL DATA					WEIGHT (LBS.)	(AS STANDARD)		REMARKS
			CAPACITY (MBH)	OUTDOOR TEMP (F)	QUANTITY	HP	V	P	H	MCA	MOCP		MANUFACTURER	MODEL	
DC-H01	POOL	HOTEL LOW ROOF	368	95	2	3.9	460	3	60	10	15	1500	POOLPAK	NG-V-12	1 - 3

Additions and Renovations to Harrah's Cherokee Valley River
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Murphy, NC 28906

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SCALE

REVISIONS

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HVAC SCHEDULES

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HVAC - CV AND VAV SUPPLY TERMINAL UNIT SCHEDULE - HOTEL

REMARKS:
1. PROVIDE UNIT WITH DISCONNECT SWITCH.
2. BOTH LEFT HAND AND RIGHT HAND CONTROL PANEL MOUNTING CONFIGURATIONS ARE USED WITHIN THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF PANEL MOUNTINGS.
3. PROVIDE WITH MODULATING HEAT CONTROL FOR SIZES AVAILABLE. IF MODULATING HEAT IS NOT AVAILABLE PROVIDE A MINIMUM OF 2 STAGES.

	UNIT NUMBER	SERVICE	AHU INTERLOCK	MAX AIRFLOW (CFM)	MIN AIRFLOW (CFM)	ELECTRIC HEAT				ELECTRICAL			INLET SIZE	DISCHARGE COLLAR SIZE (IN. x IN.)	MIN. INLET SP (IN. WG)	(AS STANDARD)		REMARKS
						HEATING AIRFLOW (CFM)	EAT	LAT	KW	V	PH	HZ				MANUFACTURER	MODEL	
HOTEL	CV-H01	HOTEL 1ST LEVEL	ERV-H02	285	285	-	-	-	-	115	1	60	5	10 x 8	0.75	TRANE	VCCF	1 - 2
	CV-H02	HOTEL 1ST LEVEL	ERV-H02	1,315	1,315	1,315	55	75	8.0	480	3	60	10	14 x 12	0.75	TRANE	VCEF	1 - 3
	VAV-H03	HOTEL 1ST LEVEL	ERV-H02	1,640	75	1,640	55	75	10.0	480	3	60	12	17 x 14	0.75	TRANE	VCEF	1 - 3
	CV-H04	HOTEL 1ST LEVEL	ERV-H02	1,065	1,065	1,065	55	75	6.5	480	3	60	10	14 x 12	0.75	TRANE	VCEF	1 - 3
	CV-H05	HOTEL 1ST LEVEL	ERV-H02	400	400	-	-	-	-	115	1	60	6	10 x 8	0.75	TRANE	VCCF	1 - 2
	CV-H06	HOTEL 2ND LEVEL	ERV-H02	725	725	-	-	-	-	115	1	60	8	11 x 10	0.75	TRANE	VCCF	1 - 2
	CV-H07	HOTEL 2ND LEVEL	ERV-H02	805	805	-	-	-	-	115	1	60	8	11 x 10	0.75	TRANE	VCCF	1 - 2
	CV-H08	HOTEL 2ND LEVEL	ERV-H02	220	220	-	-	-	-	115	1	60	4	10 x 8	0.75	TRANE	VCCF	1 - 2
	CV-H09	HOTEL 3RD LEVEL	ERV-H02	1,005	1,005	-	-	-	-	115	1	60	10	14 x 12	0.75	TRANE	VCCF	1 - 2
	VAV-H10	HOTEL 3RD LEVEL	ERV-H02	400	120	-	-	-	-	115	1	60	6	10 x 8	0.75	TRANE	VCCF	1 - 2
	CV-H11	HOTEL 3RD LEVEL	ERV-H02	805	805	-	-	-	-	115	1	60	8	11 x 10	0.75	TRANE	VCCF	1 - 2
	CV-H12	HOTEL 3RD LEVEL	ERV-H02	755	755	-	-	-	-	115	1	60	8	11 x 10	0.75	TRANE	VCCF	1 - 2

HVAC - CV AND VAV EXHAUST TERMINAL UNIT SCHEDULE - HOTEL

REMARKS:
1. PROVIDE UNIT WITH DISCONNECT SWITCH.
2. BOTH LEFT HAND AND RIGHT HAND CONTROL PANEL MOUNTING CONFIGURATIONS ARE USED WITHIN THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF PANEL MOUNTINGS.
3. TYPE: VV = VARIABLE VOLUME CV = CONSTANT VOLUME

	UNIT NUMBER	SERVICE	TYPE	AHU INTERLOCK	MAX AIRFLOW (CFM)	MIN AIRFLOW (CFM)	INLET SIZE	DISCHARGE COLLAR SIZE (IN. x IN.)	MIN. INLET SP (IN. WG)	ELECTRICAL			(AS STANDARD)		REMARKS
										V	PH	HZ	MANUFACTURER	MODEL	
HOTEL	ECV-H01	HOTEL 1ST LEVEL	CV	ERV-H02	880	880	8	11 x 10	0.75	115	1	60	TRANE	VCCF	1 - 3
	ECV-H02	HOTEL 1ST LEVEL	CV	ERV-H02	1,085	1,085	10	14 x 12	0.75	115	1	60	TRANE	VCCF	1 - 3
	EVAV-H03	HOTEL 1ST LEVEL	VV	ERV-H02	1,400	0	10	14 x 12	0.75	115	1	60	TRANE	VCCF	1 - 3
	ECV-H04	HOTEL 2ND LEVEL	CV	ERV-H02	580	580	8	11 x 10	0.75	115	1	60	TRANE	VCCF	1 - 3
	ECV-H05	HOTEL 2ND LEVEL	CV	ERV-H02	780	780	8	11 x 10	0.75	115	1	60	TRANE	VCCF	1 - 3
	EVAV-H06	HOTEL 2ND LEVEL	VV	ERV-H02	500	0	6	10 x 8	0.75	115	1	60	TRANE	VCCF	1 - 3
	EVAV-H07	HOTEL 3RD LEVEL	VV	ERV-H02	4,000	0	16	23 x 18	0.75	115	1	60	TRANE	VCCF	1 - 3
	ECV-H08	HOTEL 3RD LEVEL	CV	ERV-H02	885	885	8	11 x 10	0.75	115	1	60	TRANE	VCCF	1 - 3

HVAC - UNIT HEATER (ELECTRIC)

REMARKS:
1. PROVIDE WITH DISCONNECT SWITCH.
2. PROVIDE WITH WALL MOUNTING BRACKET.
3. PROVIDE WITH WALL MOUNTED THERMOSTAT.
4. PROVIDE WITH INTEGRAL UNIT MOUNTED THERMOSTAT.
5. PROVIDE WITH UNIT WALL MOUNTED CONTROLLER.
6. PROVIDE WITH RECESS MOUNT ENCLOSURE WITH WHITE FINISH.
7. ELECTRIC HEATER IN EGRESS STAIRWELL SHALL BE TESTED AGAINST THE POSSIBILITY OF DUST AND/OR LINT ACCUMULATION.

UNIT NUMBER	LOCATION	TYPE	CAPACITY (KW)	ELECTRICAL DATA				(AS STANDARD)		REMARKS
				V	P	H	FLA	MANUFACTURER	MODEL	
CUH-C01	1H03 - VEST	CEILING	4.0	277	1	60	14.4	QMARK	CDF-547	1, 6
CUH-C02	1H03 - VEST	CEILING	4.0	277	1	60	14.4	QMARK	CDF-547	1, 6
CUH-H01	2A24 - VEST	CEILING	4.0	277	1	60	14.4	QMARK	CDF-547	1, 6
CUH-H02	H101A - VEST	CEILING	4.0	277	1	60	14.4	QMARK	CDF-547	1, 6
CUH-H03	H101A - VEST	CEILING	4.0	277	1	60	14.4	QMARK	CDF-547	1, 6
CUH-H04	BRIDGE VEST	CEILING	4.0	277	1	60	14.4	QMARK	CDF-547	1, 6
CUH-H05	BRIDGE VEST	CEILING	4.0	277	1	60	14.4	QMARK	CDF-547	1, 6
EUH-C01	S4 - STAIR 04	WALL	4.0	208	1	60	19.2	QMARK	LFK408F	1, 2, 4, 7
EUH-C02	1G65 - FIRE VALVE	HORIZONTAL	3.0	277	1	60	11	QMARK	MUH03-71	1, 3
EUH-C03	S3 - STAIR 03	WALL	4.0	208	1	60	19.2	QMARK	LFK408F	1, 2, 4, 7
EUH-C04	S3 - STAIR 03	WALL	4.0	208	1	60	19.2	QMARK	LFK408F	1, 2, 4, 7
EUH-H01	1A23 - GROUNDS	WALL	3.0	208	1	60	14.4	QMARK	LFK404F	1, 2, 4
EUH-H02	1A23 - GROUNDS	WALL	3.0	208	1	60	14.4	QMARK	LFK404F	1, 2, 4
EUH-H04	1A29 - TOWER PUMPS	HORIZONTAL	3.0	277	1	60	11	QMARK	MUH03-71	1, 3
EUH-H05	STAIR 01	WALL	4.8	277	1	60	17.3	QMARK	LFK487F	1, 2, 4, 7
EUH-H06	2A39 - POOL STOR	WALL	3.0	208	1	60	14.4	QMARK	LFK404F	1, 2, 4
EUH-H09	3A65A - FIRE PUMP	WALL	4.8	277	1	60	17.3	QMARK	LFK487F	1, 2, 4
EUH-H10	STAIR 02	WALL	4.8	277	1	60	17.3	QMARK	LFK487F	1, 2, 4, 7
EUH-H11	STAIR 01	WALL	4.8	277	1	60	17.3	QMARK	LFK487F	1, 2, 4, 7
EUH-H12	STAIR 02	WALL	4.8	277	1	60	17.3	QMARK	LFK487F	1, 2, 4, 7
EUH-H15	12A64A - BID ANTENNA	HORIZONTAL	3.0	277	1	60	11	QMARK	MUH03-71	1, 3
EUH-H16	12A65 - WATER HEATERS	HORIZONTAL	3.0	277	1	60	11	QMARK	MUH03-71	1, 3
EUH-H17	H1101 - ROOF ACCESS	WALL	3.0	208	1	60	14.4	QMARK	LFK404F	1, 2, 4
EUH-H18	1A25 - POOL EQUIP. RM	HORIZONTAL	3.0	277	1	60	11	QMARK	MUH03-71	1, 3
RUH-C01	SMOKING PATIO	OUTDOOR RADIANT	3.0	208	1	60	14.4	SOLAIRA	SICR4024G	1, 5
RUH-C02	SMOKING PATIO	OUTDOOR RADIANT	3.0	208	1	60	14.4	SOLAIRA	SICR4024G	1, 5
RUH-C03	SMOKING PATIO	OUTDOOR RADIANT	3.0	208	1	60	14.4	SOLAIRA	SICR4024G	1, 5
RUH-C04	SMOKING PATIO	OUTDOOR RADIANT	3.0	208	1	60	14.4	SOLAIRA	SICR4024G	1, 5
RUH-C05	SMOKING PATIO	OUTDOOR RADIANT	3.0	208	1	60	14.4	SOLAIRA	SICR4024G	1, 5
RUH-C06	SMOKING PATIO	OUTDOOR RADIANT	3.0	208	1	60	14.4	SOLAIRA	SICR4024G	1, 5
RUH-H01	DINING TERRACE	OUTDOOR RADIANT	3.0	208	1	60	14.4	SOLAIRA	SICR4024G	1, 5
RUH-H02	DINING TERRACE	OUTDOOR RADIANT	3.0	208	1	60	14.4	SOLAIRA	SICR4024G	1, 5
RUH-H03	DINING TERRACE	OUTDOOR RADIANT	3.0	208	1	60	14.4	SOLAIRA	SICR4024G	1, 5
RUH-H04	DINING TERRACE	OUTDOOR RADIANT	3.0	208	1	60	14.4	SOLAIRA	SICR4024G	1, 5

HVAC - STAIRWELL PRESSURIZATION FAN

REMARKS:
1. PROVIDE DISCONNECT SWITCH.
2. VFD'S TO BE PROVIDED BY MECHANICAL CONTRACTOR. REFER TO SPECIFICATIONS FOR VFD REQUIREMENTS
3. PROVIDE WITH MANUFACTURERS SPRING ISOLATION KIT.
4. PROVIDE DRAIN AND CLEANOUT.
5. FANS TO BE SPARK PROOF RATED.
6. STAIR PRESSURIZATION FANS SELECTED AT 120% OF DESIGN CFM LISTED.

	UNIT NUMBER	SERVICE	LOCATION	FAN DATA					MOTOR DATA		ELECTRICAL DATA					SONES	WEIGHT (LBS.)	(AS STANDARD)		REMARKS
				FLOW RATE (CFM)	EXTERNAL STATIC (IN. WC)	RPM	BHP	TYPE	HP	DRIVE	V	P	H	FLA	LR, STBY, OR N POWER			MANUFACTURER	MODEL	
HOTEL	SPF-H01	STAIR 01 PRESSURIZATION	HOTEL ROOF	9,500	1.00	942	3.4	UTILITY	5	BELT	460	3	60	7.6	LR	25	775	GREENHECK	USF-27-B4	1 - 6
	SPF-H02	STAIR 02 PRESSURIZATION	HOTEL ROOF	2,550	1.00	997	0.72	UTILITY	1.5	BELT	460	3	60	3	LR	23	245	GREENHECK	USF-18-B2	1 - 6

HVAC - SUPPLY FAN

REMARKS:
1. PROVIDE DISCONNECT SWITCH
2. PROVIDE WITH MANUFACTURERS SPRING ISOLATION KIT.
3. PROVIDE ECM MOTOR WITH SPEED DIAL, CONTROL TRANSFORMER MOUNTED AND WIRED
4. FAN CONTROLLED BY THERMOSTAT.

	UNIT NUMBER	SERVICE	LOCATION	FAN DATA					MOTOR DATA		ELECTRICAL DATA					SONES	WEIGHT (LBS.)	(AS STANDARD)		REMARKS
				FLOW RATE (CFM)	EXTERNAL STATIC (IN. WC)	RPM	BHP	TYPE	HP	DRIVE	V	P	H	FLA	LR, STBY, OR N POWER			MANUFACTURER	MODEL	
CASINO	SF-C01	CASINO ENTRY VEST	1H03 - VEST	750	0.50	1335	0.11	INLINE	0.25	DIRECT	115	1	60	3.8	LR	7	75	GREENHECK	SQ-100-VG	1 - 4
	SF-C02	1G66 - ELEC	1G100 - CORR	200	0.30	1300	0.03	INLINE	0.05	DIRECT	115	1	60	0.8	LR	5	50	GREENHECK	SQ-80	1, 2, 4

HVAC - POST FIRE PURGE FAN

REMARKS:
1. PROVIDE DISCONNECT SWITCH.
2. VFD'S TO BE PROVIDED BY MECHANICAL CONTRACTOR. REFER TO SPECIFICATIONS FOR VFD REQUIREMENTS
3. PROVIDE WITH MANUFACTURERS SPRING ISOLATION KIT.
4. FANS TO BE SMOKE RATED PER UL 705.

UNIT NUMBER	SERVICE	LOCATION	FAN DATA					MOTOR DATA		ELECTRICAL DATA					SONES	WEIGHT (LBS.)	(AS STANDARD)		REMARKS
			FLOW RATE (CFM)	EXTERNAL STATIC (IN. WC)	RPM	BHP	WHEEL TYPE	HP	DRIVE	V	P	H	FLA	LR, STBY, OR N POWER			MANUFACTURER	MODEL	
PPF-H01	PODIUM PURGE	HOTEL LOW ROOF	10,600	2.40	1205	6.9	UTILITY	10	BELT	460	3	60	14	N	27	850	GREENHECK	USF-27-B4	1 - 4
PPF-H02	POOL PURGE	HOTEL LOW ROOF	10,000	2.00	1118	5.5	UTILITY	7.5	BELT	460	3	60	11	N	23	825	GREENHECK	USF-27-B4	1 - 4
PPF-H03	HOTEL PURGE	HOTEL ROOF	14,000	1.80	840	6.7	UTILITY	10	BELT	460	3	60	14	N	24	1150	GREENHECK	USF-33-B4	1 - 4

HVAC - AIR CURTAIN

REMARKS:
1. PROVIDE WITH MANUFACTURER'S MOUNTING BRACKET AND INSTALL PER MANUFACTURER'S INSTRUCTIONS.
2. PROVIDE INTEGRAL STARTER AND DISCONNECT SWITCH.
3. PROVIDE WITH NORMALLY CLOSED DOOR LIMIT SWITCH FOR INSTALLATION ON DOOR. AIR CURTAIN SHALL ENERGIZE WHEN DOOR OPENS. PROVIDE MANUFACTURERS UNIT MOUNTED CONTROLLER.
4. UNIT SHALL HAVE AN ALLOWABLE MOUNTING HEIGHT A MINIMUM OF 10'.

UNIT NUMBER	LOCATION	AIRFLOW (CFM)	MOTOR DATA		ELECTRIC COIL CAPACITY (KW)	ELECTRICAL DATA							LENGTH (IN)	WEIGHT (LBS.)	(AS STANDARD)		REMARKS
			QTY	MOTOR (HP)		V	P	H	CIRCUIT #1		CIRCUIT #2				MANUFACTURER	MODEL	
									MCA	MOCP	MCA	MOCP					
AC-C01	1303 - EX GREAT HALL	2,706	2	0.5	20	208	3	60	36.4	45	27.8	35	72	176	BERNER	AC10-E-2072EX-200	1 - 4
AC-H01	12a56 - KITCHEN	3,608	2	0.5	0	120	1	60	13	20	-	-	72	84	BERNER	CHD10-2072AA-R	1 - 4

HVAC - CV AND VAV SUPPLY TERMINAL UNIT SCHEDULE - CASINO

REMARKS:
1. PROVIDE UNIT WITH DISCONNECT SWITCH.
2. BOTH LEFT HAND AND RIGHT HAND CONTROL PANEL MOUNTING CONFIGURATIONS ARE USED WITHIN THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF PANEL MOUNTINGS.
3. PROVIDE WITH MODULATING HEAT CONTROL FOR SIZES AVAILABLE. IF MODULATING HEAT IS NOT AVAILABLE PROVIDE A MINIMUM OF 2 STAGES.

	UNIT NUMBER	SERVICE	AHU INTERLOCK	MAX AIRFLOW (CFM)	MIN AIRFLOW (CFM)	HEATING AIRFLOW (CFM)	HEATING COIL DATA						INLET SIZE	DISCHARGE COLLAR SIZE (IN. x IN.)	MIN. INLET SP (IN. WG)	(AS STANDARD)		REMARKS
							EAT	LAT	KW	V	PH	HZ				MANUFACTURER	MODEL	
	VAV-C5.06	EXP EDR	RTU-5 (EX)	660	200	330	55	84	3.0	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C10.02	EX CIRC / EX EMT	RTU-10 (EX)	345	165	275	55	92	3.0	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C11.05	DISPATCH / EMT / RISK MGR	RTU-11 (EX)	1,065	320	535	55	93	6.0	277	1	60	10	14 x 12	0.75	TRANE	VCEF	1 - 3
	VAV-C11.10	SEC MGR / TGC / INVSTGTR	RTU-11 (EX)	415	125	210	55	95	3.5	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C11.13	EX PERFORMANCE GAMES SHOP	RTU-11 (EX)	550	165	275	55	98	3.5	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C11.18	CONF RM	RTU-11 (EX)	400	160	200	55	89	2.0	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C11.19	EX CORRIDOR	RTU-11 (EX)	300	90	150	55	89	1.5	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
CASINO	VAV-C101	TABLES / SLOTS / CORR / STAIR	RTU-C01	430	130	215	55	87	2.0	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C102	SR MGR / SLOTS / ASST MGR	RTU-C01	355	145	180	55	93	2.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C104	CP / OPS OFFICE	RTU-C01	1,070	325	500	55	89	6.0	277	1	60	12	17 x 14	0.75	TRANE	VCEF	1 - 3
	VAV-C105	CASHIER	RTU-C01	520	75	125	55	96	1.5	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C106	MKTG WORK RM	RTU-C01	1,295	390	645	55	88	6.0	277	1	60	12	17 x 14	0.75	TRANE	VCEF	1 - 3
	VAV-C107	CNF RM	RTU-C01	325	130	195	55	86	1.5	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C108	OFFICE	RTU-C01	160	60	85	55	95	1.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C110	CR MGR / MKTG DIR / CORRIDOR	RTU-C01	360	145	180	55	93	2.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C111	IT MGR	RTU-C01	170	60	85	55	95	1.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C112	IT WORK RM / STOR	RTU-C01	1,295	390	645	55	87	6.0	277	1	60	12	17 x 14	0.75	TRANE	VCEF	1 - 3
	VAV-C113	IT SPVSR / NETWORK ADMIN	RTU-C01	280	80	130	55	94	1.5	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C114	CORRIDOR	RTU-C01	505	145	235	55	91	2.5	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C115	OFFICE	RTU-C01	190	60	95	55	88	1.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C201	STOR / HOLDING	RTU-C02	180	55	90	55	93	1.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C202	BEV / VOC BAR	RTU-C02	2,255	680	1,130	55	85	10.0	460	3	60	14	19 x 18	0.75	TRANE	VCEF	1 - 3
	VAV-C203	CHIP RM	RTU-C02	250	75	125	55	96	1.5	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C204	ADMIN / LD INSP	RTU-C02	180	60	90	55	93	1.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C205	TGC AGENT	RTU-C02	765	230	385	55	86	3.5	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C206	TGC	RTU-C02	180	60	90	55	93	1.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C207	TGC	RTU-C02	180	60	90	55	93	1.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C208	WOMEN / MEN	RTU-C02	130	60	85	55	95	1.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C209	HST FOUND / CORRIDOR	RTU-C02	395	145	190	55	80	2.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C210	GM / GM ADMIN / POKER / STOR	RTU-C02	500	150	250	55	80	2.0	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C211	CHF FIST / RAINIER / TM MGR	RTU-C02	290	80	150	55	95	1.5	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C212	F&B ADMIN	RTU-C02	1,160	350	580	55	84	5.0	277	1	60	12	17 x 14	0.75	TRANE	VCEF	1 - 3
	VAV-C213	COACHING	RTU-C02	265	110	135	55	93	1.5	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C215	BEV MGR / R CHEF	RTU-C02	300	90	150	55	89	1.5	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C216	CASHIER	RTU-C02	470	145	235	55	91	2.5	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C217	EMP TRANS / STOR	RTU-C02	800	240	400	55	89	4.0	277	1	60	10	14 x 12	0.75	TRANE	VCEF	1 - 3
	VAV-C218	MEN / WOMEN	RTU-C02	425	130	215	55	87	2.0	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C301	PANTRY / CORRIDOR / STAIR	RTU-C03	610	185	305	55	89	3.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C302	TGC LICENSING / WORK ROOM	RTU-C03	380	115	190	55	91	2.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C303	COMP TRAINING	RTU-C03	1,125	340	565	55	88	5.5	277	1	60	12	17 x 14	0.75	TRANE	VCEF	1 - 3
	VAV-C304	TABLE GAMES TRAIN.	RTU-C03	2,300	920	1,150	55	88	11.0	460	3	60	14	19 x 18	0.75	TRANE	VCEF	1 - 3
	VAV-C305	RECEPTION	RTU-C03	585	270	295	55	90	3.0	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C306	INTERVIEW	RTU-C03	105	60	85	55	95	1.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C307	RECRUITERS	RTU-C03	180	60	85	55	95	1.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C308	ER / BENEFITS	RTU-C03	270	85	135	55	93	1.5	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C309	NEW HIRE TRAINING	RTU-C03	1,200	490	600	55	80	6.0	277	1	60	12	17 x 14	0.75	TRANE	VCEF	1 - 3
	VAV-C310	HR WORK RM / CIRC	RTU-C03	495	175	250	55	89	2.5	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C311	HR MGR / TRAINING	RTU-C03	220	65	110	55	87	1.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C312	EXEC OFFICE / TGCE / HR STOR	RTU-C03	260	80	130	55	87	1.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C313	MENS / WOMENS	RTU-C03	190	60	95	55	95	1.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C314	CORRIDOR	RTU-C03	555	170	280	55	98	3.5	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C315	RECEPT / OFFICE	RTU-C03	205	85	105	55	87	1.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C316	EXAM RM	RTU-C03	150	150	150	55	89	1.5	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C317	LAB RM	RTU-C03	200	200	200	55	89	2.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
	VAV-C318	UNIFORM STORAGE	RTU-C03	845	255	425	55	91	4.5	277	1	60	10	14 x 12	0.75	TRANE	VCEF	1 - 3

HVAC - DX SPLIT SYSTEM UNIT

REMARKS:
1. INDOOR UNIT AND OUTDOOR UNIT SHALL BE THE SAME MANUFACTURER
2. OUTDOOR UNIT POWER SUPPLY FEEDS INDOOR UNIT.
3. COORDINATE MOUNTING OF INDOOR UNIT WITH ARCHITECT.
4. PROVIDE COMPLETE REFRIGERATION SYSTEM SIZED AND INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. REFRIGERATION SYSTEM SHALL INCLUDE BUT IS NOT LIMITED TO SIGHT GLASS / MOISTURE INDICATOR, FILTER-DRIER, EXPANSION VALVES AND LIQUID RECEIVER.
5. PROVIDE STARTER / DISCONNECT FOR BOTH UNITS.
6. PROVIDE WITH LOW AMBIENT KIT.
7. PROVIDE WALL MOUNTED CONTROLLER BY UNIT MANUFACTURER.
8. PROVIDE INDOOR UNIT WITH INTEGRAL CONDENSATE PUMP (115V/60HZ/1PH). WIRE SAFETY SWITCH TO SHUT DOWN ASSOCIATED CU SECTION UPON SENSING OVERFLOW CONDITIONS.
9. PROVIDE WITH MANUFACTURER'S OPTIONAL FILTER BOX.
10. PROVIDE MANUFACTURER'S OPTIONAL CONDENSATE PUMP W/ RESERVOIR AND SENSOR EQUAL TO BLUE DIAMOND X87-721.

	UNIT NUMBER	LOCATION	TYPE	INDOOR UNIT									OUTDOOR UNIT				ELECTRICAL DATA						(AS STANDARD)		REMARKS
				COOLING DATA			HEATING DATA		FAN DATA								V	P	H	MCA	MOCP	LR, STBY, OR N POWER			

HVAC - VRF INDOOR UNIT

REMARKS:
1. INDOOR UNIT AND OUTDOOR UNIT SHALL BE THE SAME MANUFACTURER
2. PROVIDE HORIZONTAL UNIT WITH FILTER BOX ACCESSORY.
3. CONTRACTOR TO PROVIDE MANUFACTURER'S CONDENSATE PUMPS OPTION FOR WALL MOUNTED UNITS AS NEEDED. COORDINATE POWER REQUIREMENTS WITH ELECTRICAL CONTRACTOR.
4. COORDINATE ACCESS PANELS FOR CONCEALED UNITS OVER GYP. CEILINGS WITH ARCHITECT.
5. REFRIGERANT TYPE IS R410A.
6. PROVIDE MANUFACTURER'S OPTIONAL CONDENSATE PUMP W/ RESERVOIR AND SENSOR EQUAL TO BLUE DIAMOND X87-721.

	UNIT NUMBER	LOCATION	AIRFLOW (CFM)	COOLING DATA				HEATING DATA		ELECTRICAL DATA					(AS STANDARD)		REMARKS
				TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	EAT (DEG F) DB	EAT (DEG F) WB	CAPACITY (MBH)	EAT (DEG F)	V	P	H	MCA	MOCP	MANUFACTURER	MODEL	
CASINO	VRF-C01	CASINO 1ST LEVEL ELEV LOBBY	600	17.6	13.5	80.0	67.0	13.1	60	208	1	60	2.9	15	TRANE	TPEFYP018	1, 2, 5, 6
	VRF-C02	CASINO 2ND LEVEL ELEV LOBBY	600	17.6	13.5	80.0	67.0	13.1	60	208	1	60	2.9	15	TRANE	TPEFYP018	1, 2, 5
	VRF-C03	CASINO LEVEL G3 ELEV LOBBY	600	17.6	13.5	80.0	67.0	13.1	60	208	1	60	2.9	15	TRANE	TPEFYP018	1, 2, 5
	VRF-C04	CASINO LEVEL G4 ELEV LOBBY	600	17.6	13.5	80.0	67.0	13.1	60	208	1	60	2.9	15	TRANE	TPEFYP018	1, 2, 5
	VRF-C05	CASINO LEVEL G5 ELEV LOBBY	600	17.6	13.5	80.0	67.0	13.1	60	208	1	60	2.9	15	TRANE	TPEFYP018	1, 2, 5
HOTEL	VRF-H01	HOTEL 1ST LEVEL	530	16.0	12.0	75.0	62.6	11.8	70	208	1	60	1.2	15	TRANE	TPEFYP018	1, 2, 4, 5
	VRF-H02	HOTEL 1ST LEVEL	1,305	42.6	31.3	75.0	62.6	31.5	70	208	1	60	4.4	15	TRANE	TPEFYP048	1, 2, 4, 5
	VRF-H03	HOTEL 1ST LEVEL	370	10.6	8.0	75.0	62.6	8.0	70	208	1	60	0.7	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H04A	HOTEL 1ST LEVEL	300	10.6	7.5	75.0	62.6	7.9	70	208	1	60	0.2	15	TRANE	TPKFYP024	1, 3, 5
	VRF-H04B	HOTEL 1ST LEVEL	237	7.1	5.2	75.0	62.6	5.3	70	208	1	60	0.2	15	TRANE	TPKFYP024	1, 3, 5
	VRF-H04C	HOTEL 1ST LEVEL	530	13.3	9.6	75.0	62.6	10.0	70	208	1	60	1.2	15	TRANE	TPEFYP018	1, 2, 4, 5
	VRF-H04D	HOTEL 1ST LEVEL	300	22.2	18.9	75.0	62.6	15.1	70	208	1	60	0.6	15	TRANE	TPKFYP024	1, 3, 5
	VRF-H05	HOTEL 1ST LEVEL	530	16.0	12.0	75.0	62.6	11.8	70	208	1	60	1.2	15	TRANE	TPEFYP015	1, 2, 4, 5
	VRF-H06	HOTEL 1ST LEVEL	1,270	32.0	26.8	75.0	62.6	23.3	70	208	1	60	4.3	15	TRANE	TPEFYP015	1, 2, 4, 5
	VRF-H07	HOTEL 1ST LEVEL	320	7.0	6.2	75.0	62.6	5.2	70	208	1	60	0.5	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H08	HOTEL 1ST LEVEL	388	13.3	9.6	75.0	62.6	10.0	70	208	1	60	1.2	15	TRANE	TPEFYP018	1, 2, 4, 5
	VRF-H09	HOTEL 1ST LEVEL	883	26.6	20.2	75.0	62.6	19.8	70	208	1	60	2.9	15	TRANE	TPEFYP024	1, 2, 4, 5
	VRF-H10	HOTEL 1ST LEVEL	530	16.0	12.0	75.0	62.6	11.7	70	208	1	60	1.2	15	TRANE	TPEFYP024	1, 2, 4, 5
	VRF-H11	HOTEL 1ST LEVEL	250	5.4	4.8	75.0	62.6	4.0	70	208	1	60	0.5	15	TRANE	TPEFYP006	1, 2, 4, 5
	VRF-H12	HOTEL 1ST LEVEL	918	23.4	19.4	75.0	62.6	18.1	70	208	1	60	0.6	15	TRANE	TPEFYP024	1, 3, 5
	VRF-H13	HOTEL 1ST LEVEL	195	5.8	4.2	75.0	62.6	4.5	70	208	1	60	0.2	15	TRANE	TPKFYP006	1, 3, 5
	VRF-H15A	HOTEL 2ND LEVEL	1,271	32.0	26.7	75.0	62.6	22.9	70	208	1	60	4.3	15	TRANE	TPEFYP072	1, 2, 4, 5
	VRF-H15B	HOTEL 2ND LEVEL	1,271	32.0	26.7	75.0	62.6	22.9	70	208	1	60	4.3	15	TRANE	TPEFYP072	1, 2, 4, 5
	VRF-H16	HOTEL 2ND LEVEL	370	10.5	8.0	75.0	62.6	7.8	70	208	1	60	0.7	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H17	HOTEL 2ND LEVEL	885	21.1	18.1	75.0	62.6	15.5	70	208	1	60	2.9	15	TRANE	TPEFYP027	1, 2, 4, 5
	VRF-H18	HOTEL 2ND LEVEL	530	16.0	12.0	75.0	62.6	11.5	70	208	1	60	1.2	15	TRANE	TPEFYP008	1, 2, 4, 5
	VRF-H19	HOTEL 2ND LEVEL	705	21.1	15.6	75.0	62.6	15.5	70	208	1	60	1.6	15	TRANE	TPEFYP024	1, 2, 4, 5
	VRF-H20	HOTEL 2ND LEVEL	370	10.5	8.0	75.0	62.6	7.8	70	208	1	60	0.7	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H21	HOTEL 2ND LEVEL	370	10.5	8.0	75.0	62.6	7.8	70	208	1	60	2.1	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H22	HOTEL 2ND LEVEL	920	21.3	18.6	75.0	62.6	15.7	70	208	1	60	0.6	15	TRANE	TPKFYP024	1, 3, 5
	VRF-H23A	HOTEL 2ND LEVEL	320	6.9	6.2	75.0	62.6	5.0	70	208	1	60	0.5	15	TRANE	TPEFYP008	1, 2, 4, 5
	VRF-H23B	HOTEL 2ND LEVEL	390	13.2	9.6	75.0	62.6	9.7	70	208	1	60	1.2	15	TRANE	TPEFYP015	1, 2, 4, 5
	VRF-H24	HOTEL 2ND LEVEL	370	10.5	8.0	75.0	62.6	7.8	70	208	1	60	0.7	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H25	HOTEL 2ND LEVEL	1,306	42.2	31.2	75.0	62.6	30.9	70	208	1	60	4.4	15	TRANE	TPEFYP015	1, 2, 4, 5
	VRF-H26	HOTEL 2ND LEVEL	390	13.2	9.6	75.0	62.6	9.8	70	208	1	60	1.2	15	TRANE	TPEFYP015	1, 2, 4, 5
	VRF-H27	HOTEL 2ND LEVEL	705	21.0	15.6	75.0	62.6	15.5	70	208	1	2	1.6	15	TRANE	TPEFYP024	1, 2, 4, 5
	VRF-H28	HOTEL 3RD LEVEL	883	29.2	21.3	75.0	62.6	20.3	70	208	1	60	2.9	15	TRANE	TPEFYP054	1, 2, 4, 5
	VRF-H29	HOTEL 3RD LEVEL	883	29.2	21.3	75.0	62.6	20.3	70	208	1	60	2.9	15	TRANE	TPEFYP036	1, 2, 4, 5
	VRF-H30	HOTEL 3RD LEVEL	2,542	70.2	56.1	75.0	62.6	47.8	70	208	1	60	7.7	15	TRANE	TPEFYP030	1, 2, 4, 5
	VRF-H31	HOTEL 3RD LEVEL	371	12.0	8.2	75.0	62.6	9.0	70	208	1	60	0.2	15	TRANE	TPKFYP024	1, 3, 5
	VRF-H32	HOTEL 3RD LEVEL	530	17.6	12.6	75.0	62.6	12.0	70	208	1	60	1.2	15	TRANE	TPEFYP024	1, 2, 4, 5
	VRF-H33A	HOTEL 3RD LEVEL	2,545	60.7	52.5	75.0	62.6	40.2	70	208	1	60	7.7	15	TRANE	TPEFYP072	1, 2, 4, 5
	VRF-H33B	HOTEL 3RD LEVEL	2,545	60.7	52.5	75.0	62.6	40.2	70	208	1	60	7.7	15	TRANE	TPEFYP072	1, 2, 4, 5
	VRF-H34	HOTEL 3RD LEVEL	390	14.6	10.2	75.0	62.6	10.2	70	208	1	60	1.2	15	TRANE	TPEFYP015	1, 2, 4, 5
	VRF-H35	HOTEL 3RD LEVEL	247	6.0	5.0	75.0	62.6	4.0	70	208	1	60	0.5	15	TRANE	TPEFYP008	1, 2, 4, 5
	VRF-H36	HOTEL 3RD LEVEL	247	6.0	5.0	75.0	62.6	3.4	70	208	1	60	0.5	15	TRANE	TPEFYP006	1, 2, 4, 5
	VRF-H37	HOTEL 3RD LEVEL	530	15.3	11.7	75.0	62.6	10.1	70	208	1	60	1.2	15	TRANE	TPEFYP018	1, 2, 4, 5
	VRF-H38	HOTEL 3RD LEVEL	318	6.6	6.0	75.0	62.6	4.4	70	208	1	60	0.5	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H39	HOTEL 3RD LEVEL	920	23.4	19.3	75.0	62.6	18.1	70	208	1	60	0.2	15	TRANE	TPKFYP024	1, 3, 5
	VRF-H41	HOTEL 3RD LEVEL	440	17.5	12.0	75.0	62.6	13.4	70	208	1	60	0.2	15	TRANE	TPKFYP018	1, 3, 5
	VRF-H42	HOTEL 3RD LEVEL	706	20.2	15.3	75.0	62.6	13.6	70	208	1	60	1.6	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H43	HOTEL 3RD LEVEL	250	5.1	4.8	75.0	62.6	3.4	70	208	1	60	0.5	15	TRANE	TPEFYP006	1, 2, 4, 5
	VRF-H44A	GARAGE CONNECTOR	1,275	35.1	28.1	75.0	62.6	48.8	70	208	1	60	4.3	15	TRANE	TPEFYP036	1, 2, 4, 5
	VRF-H44B	GARAGE CONNECTOR	1,275	35.1	28.1	75.0	62.6	48.8	70	208	1	60	4.3	15	TRANE	TPEFYP036	1, 2, 4, 5
	VRF-H44C	GARAGE CONNECTOR	1,275	35.1	28.1	75.0	62.6	48.8	70	208	1	60	4.3	15	TRANE	TPEFYP018	1, 2, 4, 5
	VRF-H46.1	HOTEL 4TH LEVEL	300	11.6	7.9	75.0	62.6	8.2	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H46.2	HOTEL 5TH LEVEL	300	11.6	7.9	75.0	62.6	8.2	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H46.3	HOTEL 6TH LEVEL	300	11.6	7.9	75.0	62.6	8.2	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H46.4	HOTEL 7TH LEVEL	300	11.6	7.9	75.0	62.6	8.2	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H46.5	HOTEL 8TH LEVEL	300	11.6	7.9	75.0	62.6	8.2	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H46.6	HOTEL 9TH LEVEL	300	11.6	7.9	75.0	62.6	8.2	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H46.7	HOTEL 10TH LEVEL	300	11.6	7.9	75.0	62.6	8.2	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H46.8	HOTEL 11TH LEVEL	300	11.6	7.9	75.0	62.6	8.2	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H47.1	HOTEL 4TH LEVEL	370	11.6	8.5	75.0	62.6	7.1	70	208	1	60	0.7	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H47.2	HOTEL 5TH LEVEL	370	11.6	8.5	75.0	62.6	7.1	70	208	1	60	0.7	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H47.3	HOTEL 6TH LEVEL	370	11.6	8.5	75.0	62.6	7.1	70	208	1	60	0.7	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H47.4	HOTEL 7TH LEVEL	370	11.6	8.5	75.0	62.6	7.1	70	208	1	60	0.7	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H47.5	HOTEL 8TH LEVEL	370	11.6	8.5	75.0	62.6	7.1	70	208	1	60	0.7	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H47.6	HOTEL 9TH LEVEL	370	11.6	8.5	75.0	62.6	7.1	70	208	1	60	0.7	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H47.7	HOTEL 10TH LEVEL	370	11.6	8.5	75.0	62.6	7.1	70	208	1	60	0.7	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H47.8	HOTEL 11TH LEVEL	370	11.6	8.5	75.0	62.6	7.1	70	208	1	60	0.7	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H48.1	HOTEL 4TH LEVEL	920	23.4	19.4	75.0	62.6	16.5	70	208	1	60	0.6	15	TRANE	TPKFYP024	1, 3, 5
	VRF-H48.2	HOTEL 5TH LEVEL	920	23.4	19.4	75.0	62.6	16.5	70	208	1	60	0.6	15	TRANE	TPKFYP024	1, 3, 5
	VRF-H48.3	HOTEL 6TH LEVEL	920	23.4	19.4	75.0	62.6	16.5	70	208	1	60	0.6	15	TRANE	TPKFYP024	1, 3, 5
	VRF-H48.4	HOTEL 7TH LEVEL	920	23.4	19.4	75.0	62.6	16.5	70	208	1	60	0.6	15	TRANE	TPKFYP024	1, 3, 5
	VRF-H48.5	HOTEL 8TH LEVEL	920	23.4	19.4	75.0	62.6	16.5	70	208	1	60	0.6	15	TRANE	TPKFYP024	1, 3, 5
	VRF-H48.6	HOTEL 9TH LEVEL	920	23.4	19.4	75.0	62.6	16.5	70	208	1	60	0.6	15	TRANE	TPKFYP024	1, 3, 5
	VRF-H48.7	HOTEL 10TH LEVEL	920	23.4	19.4	75.0	62.6	16.5	70	208	1	60	0.6	15	TRANE	TPKFYP024	1, 3, 5
	VRF-H48.8	HOTEL 11TH LEVEL	920	23.4	19.4	75.0	62.6	16.5	70	208	1	60	0.6	15	TRANE	TPKFYP024	1, 3, 5
	VRF-H51.1	HOTEL 4TH LEVEL	300	11.7	8.0	75.0	62.6	6.8	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H51.2	HOTEL 5TH LEVEL	300	11.7	8.0	75.0	62.6	6.8	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H51.3	HOTEL 6TH LEVEL	300	11.7	8.0	75.0	62.6	6.8	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H51.4	HOTEL 7TH LEVEL	300	11.7	8.0	75.0	62.6	6.8	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H51.5	HOTEL 8TH LEVEL	300	11.7	8.0	75.0	62.6	6.8	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H51.6	HOTEL 9TH LEVEL	300	11.7	8.0	75.0	62.6	6.8	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H51.7	HOTEL 10TH LEVEL	300	11.7	8.0	75.0	62.6	6.8	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H51.8	HOTEL 11TH LEVEL	300	11.7	8.0	75.0	62.6	6.8	70	208	1	60	0.2	15	TRANE	TPKFYP012	1, 3, 5
	VRF-H52.1	HOTEL 4TH LEVEL	375	11.7	8.2	75.0	62.6	8.4	70	208	1	60	2.1	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H52.2	HOTEL 5TH LEVEL	375	11.7	8.2	75.0	62.6	8.4	70	208	1	60	2.1	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H52.3	HOTEL 6TH LEVEL	375	11.7	8.2	75.0	62.6	8.4	70	208	1	60	2.1	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H52.4	HOTEL 7TH LEVEL	375	11.7	8.2	75.0	62.6	8.4	70	208	1	60	2.1	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H52.5	HOTEL 8TH LEVEL	375	11.7	8.2	75.0	62.6	8.4	70	208	1	60	2.1	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H52.6	HOTEL 9TH LEVEL	375	11.7	8.2	75.0	62.6	8.4	70	208	1	60	2.1	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H52.7	HOTEL 10TH LEVEL	375	11.7	8.2	75.0	62.6	8.4	70	208	1	60	2.1	15	TRANE	TPEFYP012	1, 2, 4, 5
	VRF-H52.8	HOTEL 11TH LEVEL	375	11.7	8.2	75.0	62.6	8.4	70	208	1	60	2.1	15	TRANE	TPEFYP012	1, 2, 4, 5

HVAC - DX SPLIT SYSTEM UNIT (WITH HUMIDIFICATION AND REHEAT)

REMARKS:
1. INDOOR UNIT AND OUTDOOR UNIT SHALL BE THE SAME MANUFACTURER
2. PROVIDE WITH OPTIONAL AIR DISTRIBUTION GRILLE. ALIGN UNIT WITH NEW CEILING GRID.
3. PROVIDE COMPLETE REFRIGERATION SYSTEM SIZED AND INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. REFRIGERATION SYSTEM SHALL INCLUDE BUT IS NOT LIMITED TO SIGHT GLASS / MOISTURE INDICATOR, FILTER-DRIER, EXPANSION VALVES AND LIQUID RECEIVER.
4. PROVIDE STARTER / DISCONNECT FOR BOTH UNITS.
5. PROVIDE WITH LOW AMBIENT KIT.
6. PROVIDE WALL MOUNTED CONTROLLER BY UNIT MANUFACTURER WITH TEMPERATURE AND HUMIDITY CONTROL.
7. PROVIDE MANUFACTURER'S OPTIONAL DUAL FLOAT CONDENSATE PUMP. WIRE SAFETY SWITCH TO SHUT DOWN ASSOCIATED ODU SECTION UPON SENSING OVERFLOW CONDITIONS.

UNIT NUMBER	LOCATION	TYPE	INDOOR UNIT												OUTDOOR UNIT							(AS STANDARD)		REMARKS
			COOLING DATA					STEAM GENERATOR		ELECTRICAL DATA							ELECTRICAL DATA							
			AIRFLOW (CFM)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	REFRIG. TYPE	EAT (DEG F) DB	EAT (DEG F) WB	ELECTRIC REHEAT (KW)	CAPACITY (LB/HR)	INPUT KW	V	P	H	MCA	MOCP	UNIT NUMBER	NOMINAL TONNAGE	WEIGHT (LBS.)	V	P	H	MCA	MOCP	MANUFACTURER	MODEL	
IDU-C01	1D70 - CARD/DICE STOR	CEILING	750	18.4	15.6	R407C	75	62	3.6	2.5	0.88	208	1	60	31.3	35	ODU-C01	1.5	225	208	1	60	15	25	VERITIV	MMD18ENP / PFH020A	1 - 7

HVAC - FAN POWERED HEPA FILTER

REMARKS:
1. PROVIDE DISCONNECT SWITCH.
2. WHITE CABINET FINISH.
3. UNIT SHALL BE CEILING MOUNTED.

UNIT NUMBER	SERVICE	FLOW RATE (CFM)	FILTER TYPE	ELECTRICAL DATA				(AS STANDARD)		REMARKS
				V	P	H	FLA	MANUFACTURER	MODEL	
AF-C01	1D70A - DESTRUCTION	600	HEPA	115	1	60	2.1	PURE N NATURAL	MM800	1 - 3

HVAC - VRF OUTDOOR UNIT

REMARKS:
1. PROVIDE ONE DISCONNECT PER UNIT. SEE ELECTRICAL DRAWINGS FOR ELECTRICAL REQUIREMENTS.
2. UNITS TO BE MOUNTED ON CURB RAILINGS. SEE DETAILS FOR ADDITIONAL INFORMATION.
3. INDOOR AND OUTDOOR UNITS TO BE THE SAME MANUFACTURER.
4. AHRI RATINGS ARE BASED ON NON-DUCT VALUES PROVIDED BY MANUFACTURER.
5. PROVIDE LOW VOLTAGE COMMUNICATION LINE BETWEEN OUTDOOR UNIT AND INDOOR UNITS (BY ATC CONTRACTOR).

UNIT NUMBER	SERVICE	LOCATION	TYPE	COOLING DATA		HEATING DATA		COMPRESSOR		AHRI RATINGS		ELECTRICAL DATA					WEIGHT (LBS.)	(AS STANDARD)		REMARKS
				TOTAL TONS	OUTDOOR TEMP (F)	TOTAL MBH	OUTDOOR TEMP (F)	TYPE	NO.	IEER	COP	V	P	H	MCA	MOCP		MANUFACTURER	MODEL	
ACCU-C01	CASINO ELEV LOBBIES	CASINO ROOF	HEAT PUMP	8	95	66	5	SCROLL	1	30.4	4.22	460	3	60	14	20	750	TRANE	TUHYE0964	1 - 5
ACCU-H01A	HOTEL IDF/ELEC	HOTEL ROOF	HEAT PUMP	12	95	98	5	SCROLL	1	27.5	3.85	460	3	60	21	35	800	TRANE	TUHYE1443	1 - 5
ACCU-H01B	HOTEL IDF/ELEC	HOTEL ROOF	HEAT PUMP	12	95	98	5	SCROLL	1	27.5	3.85	460	3	60	21	35	800	TRANE	TUHYE1443	1 - 5
ACCU-H01C	SERVICE LOBBY / HSKPG / VENDING	HOTEL ROOF	HEAT PUMP	16	95	115	5	SCROLL	1	26.6	3.78	460	3	60	31	50	800	TRANE	TUHYE1923	1 - 5
ACCU-H01D	LOBBY/CORRIDOR	HOTEL ROOF	HEAT PUMP	8	95	69	5	SCROLL	1	30.4	4.22	460	3	60	14	20	800	TRANE	TUHYE0963	1 - 5
ACCU-H03A	HOTEL 1ST LEVEL	HOTEL LOW ROOF	HEAT RECOVERY	22	95	176	5	SCROLL	2	23.6	3.44	460	3	60	22, 19	35, 30	1400	TRANE	TURYE2643BN4	1 - 5
ACCU-H03B	HOTEL 2ND LEVEL	HOTEL LOW ROOF	HEAT RECOVERY	24	95	190	5	SCROLL	2	23.6	3.36	460	3	60	22, 22	35, 35	1400	TRANE	TURYE2884BN4	1 - 5
ACCU-H04A	HOTEL 3RD LEVEL	HOTEL LOW ROOF	HEAT RECOVERY	16	95	116	5	SCROLL	1	23.3	3.55	460	3	60	30	50	1000	TRANE	TURYE1923	1 - 5
ACCU-H04B	HOTEL 3RD LEVEL	HOTEL LOW ROOF	HEAT RECOVERY	16	95	116	5	SCROLL	1	23.3	3.55	460	3	60	30	50	1000	TRANE	TURYE1923	1 - 5
ACCU-H06	GARAGE CONNECTOR	HOTEL ROOF	HEAT PUMP	8	95	67	5	SCROLL	1	30.4	4.22	460	3	60	14	20	700	TRANE	TUHYE0963	1 - 5
ACCU-H07	PODIUM IDF/ELEC	HOTEL LOW ROOF	HEAT PUMP	10	95	82	5	SCROLL	1	28.1	4.00	460	3	60	18	25	700	TRANE	TUHYE1204	1 - 5

HVAC - COMPUTER ROOM AIR-CONDITIONING UNIT & AIR COOLED CONDENSER

REMARKS:
1. PROVIDE MICROPROCESSOR CONTROL WITH BACNET MSTP.
2. PROVIDE TWO (2) LT410 POINT LEAK DETECTORS, CONDENSATE PUMP AND DRIP PAN.
3. PROVIDE EXTRA SET OF COMMON ALARM CONTACTS.
4. PROVIDE FIRESTAT AND SMOKE DETECTOR.
5. PROVIDE DISCONNECT SWITCH.
6. PROVIDE 6" FLOOR STAND.
7. PROVIDE LOW AMBIENT CONTROL DOWN TO -20 F.

UNIT NUMBER	LOCATION	TYPE	INDOOR UNIT																			OUTDOOR UNIT								(AS STANDARD)		REMARKS
			COOLING DATA						ELECTRIC HEAT		FAN DATA				HUMIDIFIER										ELECTRICAL DATA							
			TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	REFRIG. TYPE	EAT (DEG F) DB	EAT (DEG F) WB	LAT (DEG F) DB	LAT (DEG F) WB	TOTAL CAPACITY (MBH)	POWER (KW)	AIRFLOW (CFM)	EXTERNAL	FILTER	HP	LB/HR	KW	V	PH	HZ	MCA	MOCP	UNIT NUMBER	NOMINAL TONNAGE	DB	SCOP	V	P	H	MCA	MOCP	MANUFACTURER	MODEL	
CRAC-H01	2a39 - MDF	FLOOR MOUNTED	61.9	55.4	R410A	75.0	61.1	56.5	53.1	40.9	12	2,800	0.2	MERV 8	4.2	7.7	4.8	460	3	60	36	40	CCU-H01	5	95	2.57	460	3	60	2	15	VERTIV	PX018DA / MCS028E	1 - 7
CRAC-H02	2a39 - MDF	FLOOR MOUNTED	61.9	55.4	R410A	75.0	61.1	56.5	53.1	40.9	12	2,800	0.2	MERV 8	4.2	7.7	4.8	460	3	60	36	40	CCU-H02	5	95	2.57	460	3	60	2	15	VERITIV	PX018DA / MCS028E	1 - 7

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HVAC - AIR HANDLING UNIT (DIRECT EXPANSION COOLING AND GAS HEAT AND TOTAL ENERGY WHEEL) - PHASE 2

REMARKS:
1. PROVIDE SINGLE POINT POWER CONNECTION OF 460/3/60 FOR UNIT.
2. PROVIDE VARIABLE FREQUENCY DRIVE & DISCONNECT SWITCH.
3. PROVIDE WITH MANUFACTURER'S 18" ROOF CURB.
4. PROVIDE BACNET MSTP INTERFACE.
5. PROVIDE CLASS 1 MODULATING OUTSIDE AND RETURN DAMPER WITH ECONOMIZER CONTROL.
6. PROVIDE STAINLESS STEEL OR NON CORROSIVE DRAIN PAN.
7. PROVIDE INTAKE & EXHAUST WEATHERHOOD BY EQUIPMENT MANUFACTURER.
8. PROVIDE PREMIUM EFFICIENCY MOTORS.
9. PROVIDE WITH RETURN SMOKE DETECTOR ALL RTU'S OVER 2,000 CFM.
10. PROVIDE WITH ION GENERATOR EQUAL TO PHENOMENAL AIRE C-10. ION GENERATOR SHALL BE FIELD INSTALLED BY CONTRACTOR IN RETURN DUCT PRIOR TO UNIT CONNECTION. PROVIDE SPACE PARTICULATE COUNTER AND VOC SENSOR, INSTALL NEXT TO THERMOSTAT/CO2 SENSOR.
11. PROVIDE WITH MODULATING HOT GAS REHEAT.
12. PROVIDE MODULATING TOTAL ENERGY RECOVERY WHEEL.
13. PROVIDE WITH VIBRATION ISOLATION RAILS.
14. PROVIDE WITH MODULATING PROPANE GAS FURNACE.
15. LEAD COMPRESSOR SHALL BE DIGITAL SCROLL.

UNIT NUMBER		SERVICE	LOCATION	TOTAL (CFM)	OUTDOOR AIR				SUPPLY FAN DATA						EXHAUST FAN DATA						COOLING COIL DATA						HEATING COIL DATA			
					MIN. (CFM)	SUMMER (DEG F)		WINTER (DEG F)	CAPACITY CONTROL	ESP (IN WG)	RPM	BHP	MOTOR QTY	MOTOR HP	AIRFLOW (CFM)	ESP (IN WG)	RPM	BHP	MOTOR QTY	HP	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	FACE VELOCITY (FPM)	REFRIG. TYPE	AIR DATA				INPUT (MBH)	OUTPUT (MBH)	EAT (DEG F)	LAT (DEG F)
						DB	WB	DB	RANGE	TYPE															EAT (DEG F) DB	EAT (DEG F) WB	LAT (DEG F) DB	LAT (DEG F) WB				
BEGIN	END																													
RTU-M02	RTU-M05	MULTIPURPOSE	MULTIPURPOSE ROOF	10,000	3,500	90.5	73.6	16.1	30-100%	VFD	1.6	2,357	10.1	2	7.5	1,000	1.0	2006	6.4	2	5	388.8	318.7	440	R410A	83.8	64.7	53.4	51.8	400.0	320.0	64.2	95.5

HVAC - AIR HANDLING UNIT (DIRECT EXPANSION COOLING AND GAS HEAT AND TOTAL ENERGY WHEEL) - PHASE 2 (CONT.)

UNIT NUMBER		TOTAL ENERGY WHEEL																COMPRESSORS			FILTER DATA		ELECTRICAL DATA							WEIGHT (LBS.)	(AS STANDARD)		REMARKS
				SUMMER DATA (PEAK LATENT LOAD)								WINTER DATA																				
						EXHAUST AIR				SUPPLY AIR				EXHAUST AIR				SUPPLY AIR														
						EAT (DEG F)		LAT (DEG F)		EAT (DEG F)		LAT (DEG F)		EAT (DEG F)		LAT (DEG F)		EAT (DEG F)		LAT (DEG F)												
BEGIN	END	OUTDOOR AIRFLOW (CFM)	EXHAUST AIRFLOW (CFM)	TOTAL CAPACITY (MBH)	EFFICIENCY (%)	DB	WB	DB	WB	DB	WB	DB	WB	TOTAL CAPACITY (MBH)	EFFICIENCY (%)	DB	WB	DB	WB	DB	WB	DB	WB	TYPE	QTY	EER	PRE FILTER	FINAL FILTER	V	P	H	FLA	MCA	MOCP	LR, STBY, OR N POWER		MANUFACTURER	MODEL	
RTU-M02	RTU-M05	3,500	3,180	84.5	76	83.0	63.5	88.7	71.4	90.5	73.6	85.2	66.8	173.4	76	70.0	53.0	28.5	26.0	16.1	15.0	53.4	43.2	SCROLL	3	11.8	8	13	460	3	60	91.1	95.1	110	STBY	9500	TRANE	OAND420A4	1 - 15

HVAC - AIR HANDLING UNIT (DIRECT EXPANSION COOLING AND GAS HEAT) - PHASE 2

REMARKS:
1. PROVIDE SINGLE POINT POWER CONNECTION OF 460/3/60 FOR UNIT.
2. PROVIDE VARIABLE FREQUENCY DRIVE & DISCONNECT SWITCH.
3. PROVIDE WITH MANUFACTURER'S 18" ROOF CURB WITH VIBRATION ISOLATION RAIL.
4. PROVIDE BACNET MSTP INTERFACE.
5. PROVIDE MODULATING OUTSIDE AND RETURN DAMPER WITH 0%-100% ECONOMIZER CONTROL.
6. PROVIDE STAINLESS STEEL OR NON CORROSIVE DRAIN PAN.
7. PROVIDE INTAKE & EXHAUST WEATHERHOOD BY EQUIPMENT MANUFACTURER AS APPLICABLE.
8. PROVIDE PREMIUM EFFICIENCY MOTORS.
9. PROVIDE WITH RETURN SMOKE DETECTOR ALL RTU'S OVER 2,000 CFM.
10. PROVIDE WITH ION GENERATOR EQUAL TO PHENOMENAL AIRE C-10. ION GENERATOR SHALL BE FIELD INSTALLED BY CONTRACTOR IN RETURN DUCT PRIOR TO UNIT CONNECTION.
11. PROVIDE WITH MODULATING HOT GAS REHEAT.

UNIT NUMBER	SERVICE	LOCATION	TOTAL (CFM)	OUTDOOR AIR				SUPPLY FAN DATA							EXHAUST/RETURN FAN DATA					COOLING COIL DATA							COMPRESSORS			HEATING COIL DATA				ELECTRICAL DATA							WEIGHT (LBS.)	(AS STANDARD)			REMARKS
				MIN. (CFM)	SUMMER (DEG F)		WINTER (DEG F)	CAPACITY CONTROL	ESP (IN WG)	TYPE	RPM	BHP	MOTOR HP	AIRFLOW (CFM)	ESP (IN WG)	RPM	BHP	HP	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	FACE VELOCITY (FPM)	REFRIG. TYPE	AIR DATA				TYPE	QTY	EER	INPUT (MBH)	OUTPUT (MBH)	EAT (DEG F)	LAT (DEG F)	V	P	H	FLA	MCA	MOCP		MANUFACTURER	MODEL	
					DB	WB	DB	RANGE	TYPE															EAT (DEG F) DB	EAT (DEG F) WB	LAT (DEG F) DB	LAT (DEG F) WB															
RTU-M01	MULTIPURPOSE BOH	MULTIPURPOSE ROOF	5,000	1,000	90.5	73.6	16.1	30-100%	VFD	2.1	PLENUM	1,585	5.3	7.5	5,000	1.0	2297	2.6	3	194.9	141.5	300	R410A	79.7	65.0	52.8	51.7	DIGITAL SCROLL	2	10.5	150.0	120.0	59.2	82.7	460	3	60	44.7	47.9	60	4800	TRANE	OADG017C3	1 - 11

HVAC - EXHAUST FAN - PHASE 2

REMARKS:
1. PROVIDE DISCONNECT SWITCH.
2. PROVIDE WITH 18" CURB, 120V AUTOMATIC CONTROL DAMPER WITH END SWITCH, BIRD SCREEN AND SPEED CONTROLLER.
3. PROVIDE WITH HINGED BASE KIT.

UNIT NUMBER	SERVICE	LOCATION	FAN DATA					MOTOR DATA		ELECTRICAL DATA				SONES	WEIGHT (LBS.)	(AS STANDARD)		REMARKS
			FLOW RATE (CFM)	EXTERNAL STATIC (IN. WG)	RPM	BHP	TYPE	HP	DRIVE	V	P	H	FLA			MANUFACTURER	MODEL	
EF-M01	RESTROOMS	MULTIPURPOSE ROOF	1,500	0.50	1304	0.24	DOWNBLAST	0.5	DIRECT	115	1	60	9.8	12	150	GREENHECK	G-130-A	1 - 3
EF-M02	SNACK BAR	MULTIPURPOSE ROOF	780	0.35	1328	0.11	DOWNBLAST	0.25	DIRECT	115	1	60	5.8	9	100	GREENHECK	G-099-A	1 - 3

HVAC - VAV SUPPLY TERMINAL UNIT SCHEDULE - PHASE 2

REMARKS:
1. PROVIDE UNIT WITH DISCONNECT SWITCH.
2. BOTH LEFT HAND AND RIGHT HAND CONTROL PANEL MOUNTING CONFIGURATIONS ARE USED WITHIN THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF PANEL MOUNTINGS.
3. PROVIDE WITH MODULATING HEAT CONTROL FOR SIZES AVAILABLE. IF MODULATING HEAT IS NOT AVAILABLE PROVIDE A MINIMUM OF 2 STAGES.

UNIT NUMBER	SERVICE	AHU INTERLOCK	MAX AIRFLOW (CFM)	MIN AIRFLOW (CFM)	HEATING AIRFLOW (CFM)	HEATING COIL DATA						INLET SIZE	DISCHARGE COLLAR SIZE (IN. x IN.)	MIN. INLET SP (IN. WG)	(AS STANDARD)		REMARKS
						EAT	LAT	KW	V	PH	HZ				MANUFACTURER	MODEL	
VAV-M101	CASHIER	RTU-M01	315	95	160	55	98	2.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
VAV-M102	DROP AREA / PAY OFFICE	RTU-M01	350	105	175	55	94	2.0	277	1	60	6	11 x 10	0.75	TRANE	VCEF	1 - 3
VAV-M103	MP STORAGE	RTU-M01	585	180	295	55	95	3.5	277	1	60	8	14 x 12	0.75	TRANE	VCEF	1 - 3
VAV-M104	CORR / CARD STORAGE	RTU-M01	670	270	335	55	96	4.0	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3
VAV-M105	F&B SUPPORT	RTU-M01	1,090	330	545	55	86	5.0	277	1	60	12	14 x 12	0.75	TRANE	VCEF	1 - 3
VAV-M106	SNACK BAR	RTU-M01	1,560	470	780	55	86	7.0	480	3	60	12	17 x 14	0.75	TRANE	VCEF	1 - 3
VAV-M107	MENS / WOMENS / CIRC	RTU-M01	430	130	260	55	94	3.0	277	1	60	8	11 x 10	0.75	TRANE	VCEF	1 - 3

HVAC - DX SPLIT SYSTEM UNIT - PHASE 2

REMARKS:
1. INDOOR UNIT AND OUTDOOR UNIT SHALL BE THE SAME MANUFACTURER
2. OUTDOOR UNIT POWER SUPPLY FEEDS INDOOR UNIT.
3. COORDINATE MOUNTING OF INDOOR UNIT WITH ARCHITECT.
4. PROVIDE COMPLETE REFRIGERATION SYSTEM SIZED AND INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. REFRIGERATION SYSTEM SHALL INCLUDE BUT IS NOT LIMITED TO SIGHT GLASS / MOISTURE INDICATOR, FILTER-DRIER, EXPANSION VALVES AND LIQUID RECEIVER.
5. PROVIDE STARTER / DISCONNECT FOR BOTH UNITS.
6. PROVIDE WITH LOW AMBIENT KIT.
7. PROVIDE WALL MOUNTED CONTROLLER BY UNIT MANUFACTURER.

UNIT NUMBER	LOCATION	TYPE	INDOOR UNIT							OUTDOOR UNIT				ELECTRICAL DATA						(AS STANDARD)		REMARKS
			COOLING DATA					FAN DATA														
			TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	REFRIG. TYPE	EAT (DEG F) DB	EAT (DEG F) WB	AIRFLOW (CFM)	EXTERNAL	UNIT NUMBER	NOMINAL TONNAGE	SEER	WEIGHT (LBS.)	V	P	H	MCA	MOCP	LR, STBY, OR N POWER	MANUFACTURER	MODEL	
5 FCU-M01	1N12 - ELEC	DUCTLESS	36.0	25.2	R410A	80	67	95	705	0.0	CU-M01	3	18.8	250	208	1	60	25	30	STBY	MITSUBISHI	TPKA0A036 / TRUYA036	1 - 7
FCU-M02	1N13 - ELEC	DUCTLESS	42.0	29.4	R410A	80	67	95	825	0.0	CU-M02	3.5	17.5	250	208	1	60	25	30	STBY	MITSUBISHI	TPKA0A042 / TRUYA042	1 - 7

DRAWING PRINTED FULL SIZE (30IN.) - IF WHAT SHOWING PRINTED HALF SIZE (15IN.) IT ON A 24X36 T SHEET - IF NOT EXACTLY 24" X 36" IT IS EITHER SPACE ON ALL FOUR SIDES. DRAWING PRINTED NONE, THERE SIZE OF FILL = 11.3 IN X 17 IN. FILL FIT EQUITY ON 11 X 17" ADDITIONAL 12", 24", 18" AND 330" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DESIGNATE AND CHANGE THE NUMERATOR 3 FOR EXAMPLE 1 OR 6 EXAMPLE 1 OR 9 = 2"x1" (0.5%) WILL BE 3/4"=1" FOR SCALES AT 24", 3/16" AND 332" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR BY 8 AND SHOWING THE NUMERATOR 3 FOR EXAMPLE 1 OR 6 EXAMPLE 1 OR 9 = 2"x1" (0.5%) WILL BE 3/4"=1" FOR SCALES WILL TRANSLATE BY HALF IN THIS THE DENOMINATOR BY 8 AND SHOWING THE NUMERATOR 3 FOR EXAMPLE 1 OR 6 EXAMPLE 1 OR 9 = 2"x1" (0.5%) WILL BE 3/4"=1" FOR SCALES AT 24", 3/16" AND 332" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DESIGNATE AND CHANGE THE NUMERATOR TO 1 EXAMPLE 1 OR 6 EXAMPLE 1 OR 9 = 2"x1" (0.5%) WILL BE SCALED TO 1/4"=1'-0" 2/13/2023 5:41:23 PM

Additions and Renovations to Harrah's Cherokee Valley River

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HVAC SCHEDULES

M-604

HVAC - VRF OUTDOOR UNIT - SPA AND RESTAURANT

REMARKS:
1. PROVIDE ONE DISCONNECT PER UNIT. SEE ELECTRICAL DRAWINGS FOR ELECTRICAL REQUIREMENTS.
2. UNITS TO BE MOUNTED ON CURB RAILINGS. SEE DETAILS FOR ADDITIONAL INFORMATION.
3. INDOOR AND OUTDOOR UNITS TO BE THE SAME MANUFACTURER.
4. AHRI RATINGS ARE BASED ON NON-DUCT VALUES PROVIDED BY MANUFACTURER.
5. PROVIDE LOW VOLTAGE COMMUNICATION LINE BETWEEN OUTDOOR UNIT AND INDOOR UNITS (BY ATC CONTRACTOR).

UNIT NUMBER	SERVICE	LOCATION	TYPE	COOLING DATA		HEATING DATA		COMPRESSOR		AHRI RATINGS		ELECTRICAL DATA					WEIGHT (LBS.)	(AS STANDARD)		REMARKS
				TOTAL TONS	OUTDOOR TEMP (F)	TOTAL MBH	OUTDOOR TEMP (F)	TYPE	NO.	IEER	COP	V	P	H	MCA	MOCP		MANUFACTURER	MODEL	
ACCU-R01	RESTAURANT	HOTEL ROOF	HEAT RECOVERY	14	95	114	5	SCROLL	1	25.7	3.55	460	3	60	26	40	800	TRANE	TURYE1683AN4	1 - 5
ACCU-R02	RESTAURANT	HOTEL ROOF	HEAT PUMP	24	95	200	5	SCROLL	3	25	3.78	460	3	60	18, 14, 10	25, 20, 15	2000	TRANE	TUHYE2883BN4	1 - 5
ACCU-R03	RESTAURANT	HOTEL ROOF	HEAT PUMP	24	95	200	5	SCROLL	3	25.8	3.81	460	3	60	18, 14, 10	25, 20, 15	2000	TRANE	TUHYE2883BN4	1 - 5
ACCU-S01	SPA	3RD LEVEL ON GRADE	HEAT RECOVERY	16	95	121	5	SCROLL	1	23.3	3.55	460	3	60	30	50	2000	TRANE	TURYE1924AN4	1 - 5

HVAC - VRF BRANCH CIRCUIT CONTROLLER - SPA AND RESTAURANT

REMARKS:
1. PROVIDE LOW VOLTAGE COMMUNICATION LINE BETWEEN OUTDOOR UNITS, BRANCH CONTROLLERS, AND INDOOR UNITS (BY ATC CONTRACTOR)
2. COORDINATE MOUNTING LOCATION WITH ARCHITECTUAL ACCESS PANELS.
3. REFRIGERANT BALL VALVES SHALL BE PROVIDED ON ALL PORTS.

UNIT NUMBER	SERVICE	LOCATION	ELECTRICAL DATA			NUMBER OF PORTS	WEIGHT (LBS.)	(AS STANDARD)		REMARKS
			V	P	H			MANUFACTURER	MODEL	
BC-R01	RESTAURANT	12A01 - LOBBY	208	1	60	16	155	TRANE	TCMBM1016	1 - 3
BC-S01	SPA	3A102 - LOCKER ROOM	208	1	60	16	155	TRANE	TCMBM1016	1 - 3
BC-S02	SPA	3A102 - LOCKER ROOM	208	1	60	4	155	TRANE	TCMBS0104	1 - 3

HVAC - VRF INDOOR UNIT - SPA AND RESTAURANT

REMARKS:
1. INDOOR UNIT AND OUTDOOR UNIT SHALL BE THE SAME MANUFACTURER
2. PROVIDE HORIZONTAL UNIT WITH FILTER BOX ACCESSORY.
3. CONTRACTOR TO PROVIDE MANUFACTURER'S CONDENSATE PUMPS OPTION FOR WALL MOUNTED UNITS AS NEEDED. COORDINATE POWER REQUIREMENTS WITH ELECTRICAL CONTRACTOR.
4. COORDINATE ACCESS PANELS FOR CONCEALED UNITS OVER GYP. CEILINGS WITH ARCHITECT.
5. REFRIGERANT TYPE IS R410A.
6. PROVIDE MANUFACTURER'S OPTIONAL CONDENSATE PUMP W/ RESERVOIR AND SENSOR EQUAL TO BLUE DIAMOND X87-721.

UNIT NUMBER	LOCATION	AIRFLOW (CFM)	COOLING DATA				HEATING DATA	ELECTRICAL DATA						(AS STANDARD)		REMARKS
			TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	EAT (DEG F) DB	EAT (DEG F) WB	CAPACITY (MBH)	V	P	H	MCA	MOCP		MANUFACTURER	MODEL	
VRF-R01	HOTEL 12TH LEVEL	370	12.0	9.9	75.0	62.6	8.5	70	208	1	60	2.1	15	TRANE	TPEFYP012	1, 2, 4, 5
VRF-R02	12TH LEVEL - RESTAURANT	600	17.6	13.5	75.0	62.6	12.4	70	208	1	60	3	15	TRANE	TPEFYP018	1, 2, 4, 5
VRF-R03	12TH LEVEL - RESTAURANT	1,275	35.1	28.0	75.0	62.6	26.0	70	208	1	60	4	15	TRANE	TPEFYP036	1, 2, 4, 5
VRF-R04A	12TH LEVEL - RESTAURANT	2,540	68.3	55.3	75.0	62.6	48.9	70	208	1	60	8	15	TRANE	TPEFYP072	1, 2, 4, 5
VRF-R04B	12TH LEVEL - RESTAURANT	2,540	68.3	55.3	75.0	62.6	48.9	70	208	1	60	8	15	TRANE	TPEFYP072	1, 2, 4, 5
VRF-R04C	12TH LEVEL - RESTAURANT	2,540	68.3	55.3	75.0	62.6	48.9	70	208	1	60	8	15	TRANE	TPEFYP072	1, 2, 4, 5
VRF-R04D	12TH LEVEL - RESTAURANT	2,540	68.3	55.3	75.0	62.6	48.9	70	208	1	60	8	15	TRANE	TPEFYP072	1, 2, 4, 5
VRF-R05	12TH LEVEL - RESTAURANT	1,415	52.6	36.5	75.0	62.6	39.0	70	208	1	60	4	15	TRANE	TPEFYP054	1, 2, 4, 5
VRF-R06	12TH LEVEL - RESTAURANT	2,965	84.5	66.8	75.0	62.6	60.0	70	208	1	60	8	15	TRANE	TPEFYP096	1, 2, 4, 5
VRF-R07A	12TH LEVEL - RESTAURANT	2,965	84.5	66.8	75.0	62.6	60.0	70	208	1	60	8	15	TRANE	TPEFYP096	1, 2, 4, 5
VRF-R07B	12TH LEVEL - RESTAURANT	2,965	84.5	66.8	75.0	62.6	60.0	70	208	1	60	8	15	TRANE	TPEFYP096	1, 2, 4, 5
VRF-R08	HOTEL 12TH LEVEL	370	12.0	9.9	75.0	62.6	8.5	70	208	1	60	2.1	15	TRANE	TPEFYP012	1, 2, 4, 5
VRF-R09	12TH LEVEL - RESTAURANT	600	17.6	13.5	75.0	62.6	12.4	70	208	1	60	3	15	TRANE	TPEFYP018	1, 2, 4, 5
VRF-R10	12TH LEVEL - RESTAURANT	370	11.7	8.2	75.0	62.6	8.4	70	208	1	60	2	15	TRANE	TPEFYP012	1, 2, 4, 5
VRF-R11	12a56D - OFFICE	315	8.0	6.9	75.0	62.6	9.0	70	208	1	60	1	15	TRANE	TPLFYP008	1, 5, 6
VRF-S02	HOTEL 3RD LEVEL	371	11.7	8.2	75.0	62.6	9.1	70	208	1	60	1	15	TRANE	TPEFYP012	1, 3, 5
VRF-S03	HOTEL 4TH LEVEL - SPA	1,305	46.8	33.1	75.0	62.6	31.3	70	208	1	60	4	15	TRANE	TPEFYP048	1, 2, 4, 5
VRF-S05	HOTEL 4TH LEVEL - SPA	300	5.9	5.7	75.0	62.6	5.1	70	208	1	60	2	15	TRANE	TPEFYP006	1, 2, 4, 5
VRF-S07	HOTEL 4TH LEVEL - SPA	600	17.5	13.5	75.0	62.6	11.6	70	208	1	60	3	15	TRANE	TPEFYP018	1, 2, 4, 5
VRF-S08	HOTEL 4TH LEVEL - SPA	600	17.5	13.5	75.0	62.6	11.6	70	208	1	60	3	15	TRANE	TPEFYP018	1, 2, 4, 5
VRF-S09	HOTEL 4TH LEVEL - SPA	885	23.4	19.0	75.0	62.6	15.7	70	208	1	60	3	15	TRANE	TPEFYP024	1, 2, 4, 5
VRF-S10	HOTEL 4TH LEVEL - SPA	300	5.8	5.7	75.0	62.6	3.9	70	208	1	60	2	15	TRANE	TPEFYP006	1, 2, 4, 5
VRF-S11	HOTEL 4TH LEVEL - SPA	300	5.8	5.7	75.0	62.6	3.9	70	208	1	60	2	15	TRANE	TPEFYP006	1, 2, 4, 5
VRF-S12	HOTEL 4TH LEVEL - SPA	300	5.8	5.7	75.0	62.6	3.9	70	208	1	60	2	15	TRANE	TPEFYP006	1, 2, 4, 5
VRF-S13	HOTEL 4TH LEVEL - SPA	300	5.8	5.7	75.0	62.6	3.9	70	208	1	60	2	15	TRANE	TPEFYP006	1, 2, 4, 5
VRF-S14	HOTEL 4TH LEVEL - SPA	300	5.8	5.7	75.0	62.6	3.9	70	208	1	60	2	15	TRANE	TPEFYP006	1, 2, 4, 5
VRF-S15	HOTEL 4TH LEVEL - SPA	300	5.8	5.7	75.0	62.6	3.9	70	208	1	60	2	15	TRANE	TPEFYP006	1, 2, 4, 5
VRF-S16	HOTEL 4TH LEVEL - SPA	300	5.8	5.7	75.0	62.6	3.9	70	208	1	60	2	15	TRANE	TPEFYP006	1, 2, 4, 5
VRF-S17	HOTEL 4TH LEVEL - SPA	370	11.7	8.2	75.0	62.6	7.8	70	208	1	60	2	15	TRANE	TPEFYP012	1, 2, 4, 5

HVAC - SPA AIR COOLED CONDENSER

REMARKS:
1. PROVIDE WITH ELECTRICAL DISCONNECT.
2. UNITS TO BE MOUNTED ON HOUSEKEEPING PAD. SEE DETAILS FOR ADDITIONAL INFORMATION.
3. PROVIDE COMPLETE REFRIGERATION SYSTEM SIZED AND INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. REFRIGERATION SYSTEM SHALL INCLUDE BUT IS NOT LIMITED TO SIGHT GLASS / MOISTURE INDICATOR, FILTER-DRIER, EXPANSI...

UNIT NUMBER	SERVICE	LOCATION	COOLING DATA		MOTOR DATA		ELECTRICAL DATA					WEIGHT (LBS.)	(AS STANDARD)		REMARKS
			CAPACITY (MBH)	OUTDOOR TEMP (F)	QUANTITY	HP	V	P	H	MCA	MOCP		MANUFACTURER	MODEL	
ACC-S01	SPA	3RD LEVEL	60	95	1	1.3	460	3	60	5	15	450	POOLPAK	NCV-V-01	1 - 3
ACC-S02	SPA	3RD LEVEL	60	95	1	1.3	460	3	60	5	15	450	POOLPAK	NCV-V-01	1 - 3

HVAC - SPA DEHUMIDIFICATION AIR HANDLING UNIT

REMARKS:
1. INDOOR UNIT AND OUTDOOR UNIT SHALL BE THE SAME MANUFACTURER
2. COORDINATE MOUNTING OF INDOOR UNIT WITH ARCHITECT. REFER TO MANUFACTURE'S INSTRUCTIONS TO MEET ALL CLEARANCE REQUIREMENTS WHEN INSTALLING IN CEILING.
3. PROVIDE COMPLETE REFRIGERATION SYSTEM SIZED AND INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. REFRIGERATION SYSTEM SHALL INCLUDE BUT IS NOT LIMITED TO SIGHT GLASS / MOISTURE INDICATOR, FILTER-DRIER, EXPANSION VALVES AND LIQUID RECEIVER.
4. PROVIDE STARTER / DISCONNECT FOR BOTH UNITS.
5. PROVIDE WALL MOUNTED CONTROLLER BY UNIT MANUFACTURER.

UNIT NUMBER	SERVICE	LOCATION	TOTAL AIRFLOW (CFM)	OUTSIDE AIRFLOW (CFM)	SUPPLY FAN DATA				COOLING DATA					COMPRESSOR DATA		ELECTRICAL DATA						WEIGHT (LBS.)	(AS STANDARD)		REMARKS
					ESP (IN WG)	TYPE	MOTOR QTY	MOTOR HP	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	FACE VELOCITY (FPM)	REFRIG. TYPE	EAT DB	EAT WB	QUANTITY	TYPE	V	P	H	FLA	MCA	MOCP		MANUFACTURER	MODEL	
AHU-S01	SPA	HOT TUB	1,300	200	1.0		1	3.2	56.5	23.1	0	R410A	75.0	60.0	1		480	3	60	38.1	48	50	0	POOLPAK	PCP-1400-PB	1 - 5
AHU-S02	SPA	HOT TUB	1,300	200	1.0		1	3.2	56.5	23.1	0	R410A	75.0	60.0	1		480	3	60	38.1	48	50	0	POOLPAK	PCP-1400-PB	1 - 5

HVAC - MAKE UP AIR UNIT

REMARKS:
1. PROVIDE SINGLE POINT POWER CONNECTION OF 460/3/60 FOR UNIT.
2. PROVIDE VARIABLE FREQUENCY DRIVE & DISCONNECT SWITCH.
3. PROVIDE WITH MANUFACTURER'S 18" ROOF CURB WITH VIBRATION ISOLATION RAIL.
4. PROVIDE BACNET MSTP INTERFACE.
5. PROVIDE CLASS 1 MODULATING OUTSIDE AIR DAMPER.
6. PROVIDE INTAKE WEATHERHOOD BY EQUIPMENT MANUFACTURER.
7. PROVIDE PREMIUM EFFICIENCY MOTORS.
8. PROVIDE COMPLETE REFRIGERATION SYSTEM SIZED AND INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. REFRIGERATION SYSTEM SHALL INCLUDE BUT IS NOT LIMITED TO SIGHT GLASS / MOISTURE INDICATOR, FILTER-DRIER, EXPANSION VALVES AND LIQUID RECEIVER.

UNIT NUMBER	SERVICE	LOCATION	TOTAL (CFM)	SUPPLY FAN DATA						COOLING COIL DATA				HEATING COIL DATA					ELECTRICAL DATA			WEIGHT (LBS.)	(AS STANDARD)		REMARKS
				CAPACITY (CONTROL)	ESP (IN WG)	RPM	BHP	MOTOR QTY	MOTOR HP	TOTAL CAPACITY (MBH)	EAT (DEG F) DB	EAT (DEG F) WB	LAT (DEG F) DB	LAT (DEG F) WB	INPUT (MBH)	OUTPUT (MBH)	EAT (DEG F)	LAT (DEG F)	FINAL FILTER	V	P	H		MANUFACTURER	MODEL	
DO	MAU-R01	KITCHEN	HOTEL ROOF	9,860	VFD	2.1	1,020	11.5	1	15	291	90.5	73.6	70.0	70.0	578.0	532.0	16.1	63.8	MERV 8	460	3	60	3000	HALTON	MUA-DGX-12600	1 - 8

HVAC - MAU CONDENSING UNIT

REMARKS:
1. PROVIDE WITH ELECTRICAL DISCONNECT.
2. UNITS TO BE MOUNTED ON CURB RAILINGS. SEE DETAILS FOR ADDITIONAL INFORMATION.
3. PROVIDE COMPLETE REFRIGERATION SYSTEM SIZED AND INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. REFRIGERATION SYSTEM SHALL INCLUDE BUT IS NOT LIMITED TO SIGHT GLASS / MOISTURE INDICATOR, FILTER-DRIER, EXPANSION VALVES AND LIQUID RECEIVER.

UNIT NUMBER	SERVICE	LOCATION	COOLING DATA		COMPRESSOR DATA		ELECTRICAL DATA						WEIGHT (LBS.)	(AS STANDARD)		REMARKS
			CAPACITY (TONS)	OUTDOOR TEMP (F)	QUANTITY	TYPE	V	P	H	MCA	MOCP			MANUFACTURER	MODEL	
MCU-R01	MAU-R01	HOTEL ROOF	25	95	2	SCROLL	460	3	60	49	60	1000		TRANE	TTA300044C	1 - 3

HVAC - KITCHEN EXHAUST FAN

REMARKS:
1. PROVIDE DISCONNECT SWITCH.
2. VFD PROVIDED BY FOOD SERVICE WITH HOOD MANUFACTURER'S CONTROL SYSTEM. FAN CONTROLLED BY HOOD CONTROL SYSTEM, SEE FOOD SERVICE DRAWINGS.
3. PROVIDE WITH 18" CURB AND BIRD SCREEN.
4. PROVIDE WITH HINGED BASE KIT.

UNIT NUMBER	SERVICE	LOCATION	FAN DATA				MOTOR DATA		ELECTRICAL DATA					WEIGHT (LBS.)	(AS STANDARD)		REMARKS
			FLOW RATE (CFM)	EXTERNAL STATIC PRESSURE (IN. W.G.)	RPM	BHP	HP	DRIVE	V	P	H	FLA	SONES		MANUFACTURER	MODEL	
KEF-R01	EXPO HOOD	HOTEL ROOF	9,374	1.50	929	4.2	5	BELT	460	3	60	7.6	22	300	GREENHECK	CUBE-300	1 - 4
KEF-R02	PREP HOOD	HOTEL ROOF	3,538	1.00	1483	1.4	3	BELT	460	3	60	4.8	21	200	GREENHECK	CUBE-180HP	1 - 4

HVAC - CV AND VAV SUPPLY TERMINAL UNIT SCHEDULE - RESTAURANT

REMARKS:
1. PROVIDE UNIT WITH DISCONNECT SWITCH.
2. BOTH LEFT HAND AND RIGHT HAND CONTROL PANEL MOUNTING CONFIGURATIONS ARE USED WITHIN THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF PANEL MOUNTINGS.
3. PROVIDE WITH MODULATING HEAT CONTROL FOR SIZES AVAILABLE. IF MODULATING HEAT IS NOT AVAILABLE PROVIDE A MINIMUM OF 2 STAGES.

UNIT NUMBER	SERVICE	AHU INTERLOCK	MAX AIRFLOW (CFM)	MIN AIRFLOW (CFM)	ELECTRIC HEAT				ELECTRICAL			INLET SIZE	DISCHARGE COLLAR SIZE (IN. x IN.)	MIN. INLET SP (IN. WG)	(AS STANDARD)		REMARKS
					HEATING AIRFLOW (CFM)	EAT	LAT	KW	V	PH	HZ				MANUFACTURER	MODEL	
VAV-R01	PREP HOOD	MAU-R01	2,830	850	-	-	-	-	115	1	60	14	20 x18	0.75	HALTON	KVV-S	1, 2
VAV-R02	EXPO HOOD	MAU-R01	7,030	2,100	-	-	-	-	115	1	60	24x16	38 x 18	0.75	HALTON	KVV-S	1, 2
VAV-R03	BATHROOMS	ERV-H03	1,030	310	515	55	80	4.0	277	1	60	10	14 x 12	0.75	TRANE	VCEF	1 - 3
CV-R04	KITCHEN	ERV-H03	835	250	-	-	-	-	115	1	60	10	14 x 12	0.75	TRANE	VCCF	1, 2
CV-R05	DINING	ERV-H03	2,895	870	-	-	-	-	115	1	60	16	23 x 18	0.75	TRANE	VCCF	1, 2

HVAC - CV AND VAV EXHAUST TERMINAL UNIT SCHEDULE - RESTAURANT

REMARKS:
1. PROVIDE UNIT WITH DISCONNECT SWITCH.
2. BOTH LEFT HAND AND RIGHT HAND CONTROL PANEL MOUNTING CONFIGURATIONS ARE USED WITHIN THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF PANEL MOUNTINGS.
3. TYPE: VV = VARIABLE VOLUME CV = CONSTANT VOLUME

UNIT NUMBER	SERVICE	TYPE	AHU INTERLOCK	MAX AIRFLOW (CFM)	MIN AIRFLOW (CFM)	INLET SIZE	DISCHARGE COLLAR SIZE (IN. x IN.)	MIN. INLET SP (IN. WG)	ELECTRICAL			(AS STANDARD)		REMARKS
									V	PH	HZ	MANUFACTURER	MODEL	
ECV-R01	KITCHEN	CV	ERV-H03	1,385	1,385	12	17 x 14	0.75	115	1	60	TRANE	VCCF	1 - 3
EVAV-R02	DINING	VV	ERV-H03	2,000	0	14	19 x 18	0.75	115	1	60	TRANE	VCCF	1 - 3

HVAC - CV AND VAV EXHAUST TERMINAL UNIT SCHEDULE - SPA

REMARKS:
1. PROVIDE UNIT WITH DISCONNECT SWITCH.
2. BOTH LEFT HAND AND RIGHT HAND CONTROL PANEL MOUNTING CONFIGURATIONS ARE USED WITHIN THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF PANEL MOUNTINGS.
3. TYPE: VV = VARIABLE VOLUME CV = CONSTANT VOLUME

UNIT NUMBER	SERVICE	TYPE	AHU INTERLOCK	MAX AIRFLOW (CFM)	MIN AIRFLOW (CFM)	INLET SIZE	DISCHARGE COLLAR SIZE (IN. x IN.)	MIN. INLET SP (IN. WG)	ELECTRICAL			(AS STANDARD)		REMARKS
									V	PH	HZ	MANUFACTURER	MODEL	
ECV-S01	HOTEL 3RD LEVEL	CV	ERV-H02	805	805	8	11 x 10	0.75	115	1	60	TRANE	VCCF	1 - 3
ECV-S02	HOTEL 3RD LEVEL	CV	ERV-H02	1,230	1,230	10	14 x 12	0.75	115	1	60	TRANE	VCCF	1 - 3

HVAC - CV AND VAV SUPPLY TERMINAL UNIT SCHEDULE - SPA

REMARKS:
1. PROVIDE UNIT WITH DISCONNECT SWITCH.
2. BOTH LEFT HAND AND RIGHT HAND CONTROL PANEL MOUNTING CONFIGURATIONS ARE USED WITHIN THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF PANEL MOUNTINGS.
3. PROVIDE WITH MODULATING HEAT CONTROL FOR SIZES AVAILABLE. IF MODULATING HEAT IS NOT AVAILABLE PROVIDE A MINIMUM OF 2 STAGES.

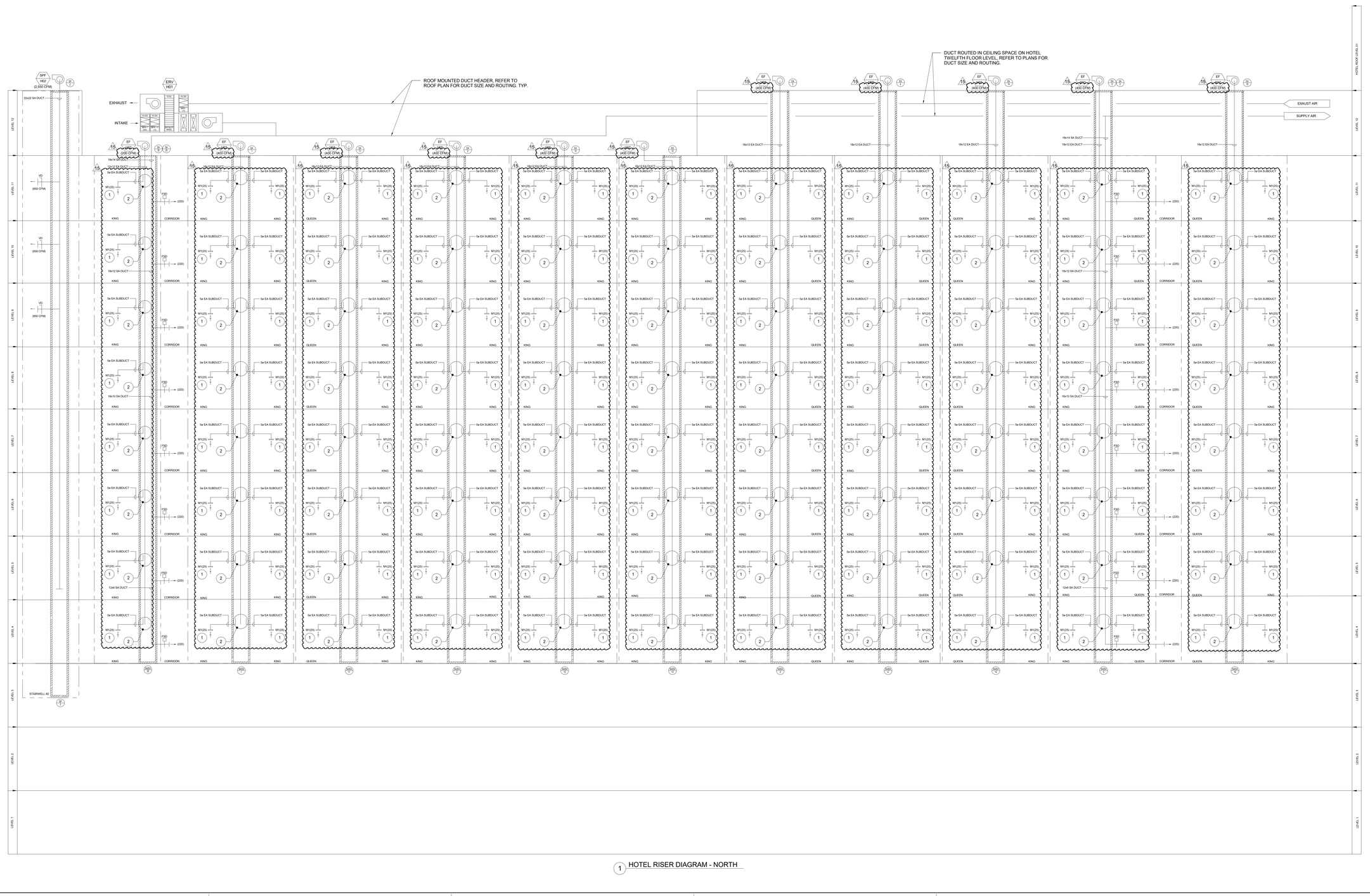
UNIT NUMBER	SERVICE	AHU INTERLOCK	MAX AIRFLOW (CFM)	MIN AIRFLOW (CFM)	ELECTRIC HEAT				ELECTRICAL			INLET SIZE	DISCHARGE COLLAR SIZE (IN. x IN.)	MIN. INLET SP (IN. WG)	(AS STANDARD)		REMARKS
					HEATING AIRFLOW (CFM)	EAT	LAT	KW	V	PH	HZ				MANUFACTURER	MODEL	
CV-S01	HOTEL 3RD LEVEL	ERV-H02	1,120	1,120	1120	55	95	11.0	480	3	60	10	14 x 12	0.75	TRANE	VCEF	1 - 3
CV-S02	HOTEL 3RD LEVEL	ERV-H02	450	450	450	55	95	4.0	277	1	60	6	10 x 8	0.75	TRANE	VCEF	1 - 3
CV-S03	HOTEL 3RD LEVEL	ERV-H02	450	450	450	55	95	4.0	277	1	60	6	10 x 8	0.75	TRANE	VCEF	1 - 3
CV-S04	HOTEL 3RD LEVEL	ERV-H02	100	100	100	55	72	1.0	277	1	60	4	10 x 8	0.75	TRANE	VCEF	1 - 3
CV-S05	HOTEL 3RD LEVEL	ERV-H02	380	380	380	55	95	4.0	277	1	60	6	10 x 8	0.75	TRANE	VCEF	1 - 3
CV-S06	HOTEL 3RD LEVEL	ERV-H02	190	190	-	-	-	-	115	1	60	4	10 x 8	0.75	TRANE	VCCF	1 - 2
CV-S07	HOTEL 3RD LEVEL	ERV-H02	200	200	-	-	-	-	115	1	60	4	10 x 8	0.75	TRANE	VCCF	1 - 2
CV-S08	HOTEL 3RD LEVEL	ERV-H02	475	475	-	-	-	-	115	1	60	6	10 x 8	0.75	TRANE	VCCF	1 - 2
CV-S09	HOTEL 3RD LEVEL	ERV-H02	580	580	-	-	-	-	115	1	60	8	11 x 10	0.75	TRANE	VCCF	1 - 2

DRAWING PRINTED FULL SIZE (30IN.) - IF NOT 30INX42IN PRINTED HALF SIZE (15IN.) - IF NOT 15INX21IN PRINTED AT 1/4" = 1'-0" FOR SCALES AT 1/4", 3/8", 1/2" AND 3/4" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DIMENSIONATION ACCURATELY AND CHANGE THE NUMERATION TO 1/2, 3/8, 1/4" = 1'-0" (1:2), (1:1.5), (1:1) OR (1:0.5) IF YOU'LL FIT EQUITY ON 11X17" (ARCHITECTURAL "C" SIZE) AT 1/8", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DIMENSIONATION AND CHANGE THE NUMERATION TO 1/16, 3/16, 1/8" = 1'-0" (1:16), (1:8), (1:4) OR (1:2) IF YOU'LL FIT EQUITY ON 11X17" (ARCHITECTURAL "B

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KEY NOTES:

1. EACH GUESTROOM EXHAUST GRILLE TO BE AMERICAN ALDES SELF BALANCING EXHAUST/SUPPLY GRILLE OR APPROVED EQUAL.
2. EACH GUESTROOM EXHAUST TO CONNECT TO SHAFT UTILIZING A 22" SUBDUCT.



1 HOTEL RISER DIAGRAM - NORTH

Additions and Renovations to Harrah's Cherokee Valley River

777 Casino Parkway
Murphy, NC 28906

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BULLETIN 12
06/28/2023

ISSUE 01/31/2023
JOB 30611.00
DRAWN MWM
SCALE NTS

REVISIONS

10 2023-0427 BULLETIN 06
15 06/28/2023 BULLETIN 12

HVAC RISER DIAGRAM

M-700

6/27/2023 10:40:27 PM
DRAWING PRINTED FULL SIZE (100%) = 36"x48" DRAWING PRINTED HALF SIZE (50%) WILL FIT ON A SHEET 18"x24" WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED MANILY THREE SIZE (37.5%) = 11.25"x15.75" WILL FIT TIGHTLY ON 11"x17". INDIVIDUAL 12", 14", 16", 18" AND 120" VIEWS SCALES WILL TYPICALLY BE AS SHOWN THE DENOMINATOR (12) EQUILANT AND CHANGE THE NUMERATOR (1) 1 EXAMPLE: 1/8"=1'-0" AT 37.5% WILL BE 3/64"=1'-0"

790



1 HOTEL RISER DIAGRAM - SOUTH

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BULLETIN 12
06/28/2023

ISSUE	01/31/2023
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DRAWN	MWM
SCALE	NTS

REVISIONS

10	2023-0427	BULLETIN 06
15	06/28/2023	BULLETIN 12

HVAC RISER DIAGRAM

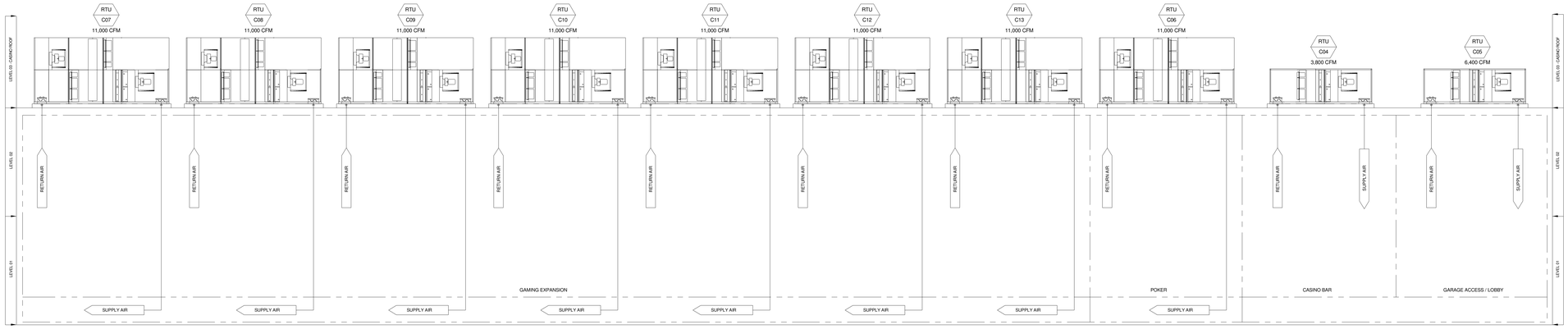
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DRAWING PRINTED FULL SIZE (30"H) - [PLAN]* DRAWING PRINTED HALF SIZE (15"H) WILL FIT ON A SHEET 15"W/2"H WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15"H) WILL FIT ON A SHEET 11"W/2"H WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. [27 PSI] = 11.25"H/3.75" WILL FIT TIGHTLY ONTO 11"H/3" INDIVIDUAL 12", 18", 24", 30", AND 120" VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 2 AND MAKING THE NUMERATOR 3. FOR EXAMPLE, 3/8"=1'-0" BECOMES 3/4"=1'-0".

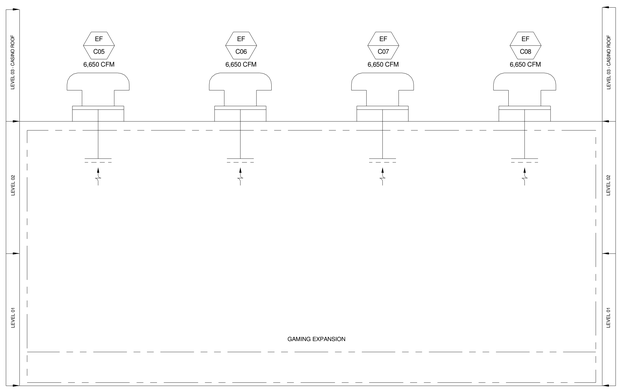
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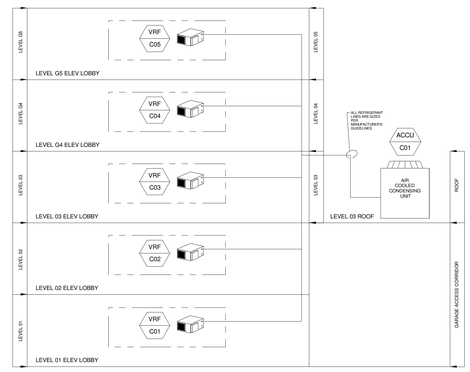
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1 CASINO AIRFLOW RISER DIAGRAM



2 CASINO AIRFLOW RISER DIAGRAM - EXHAUST



3 CASINO VRF RISER DIAGRAM - ELEV LOBBY

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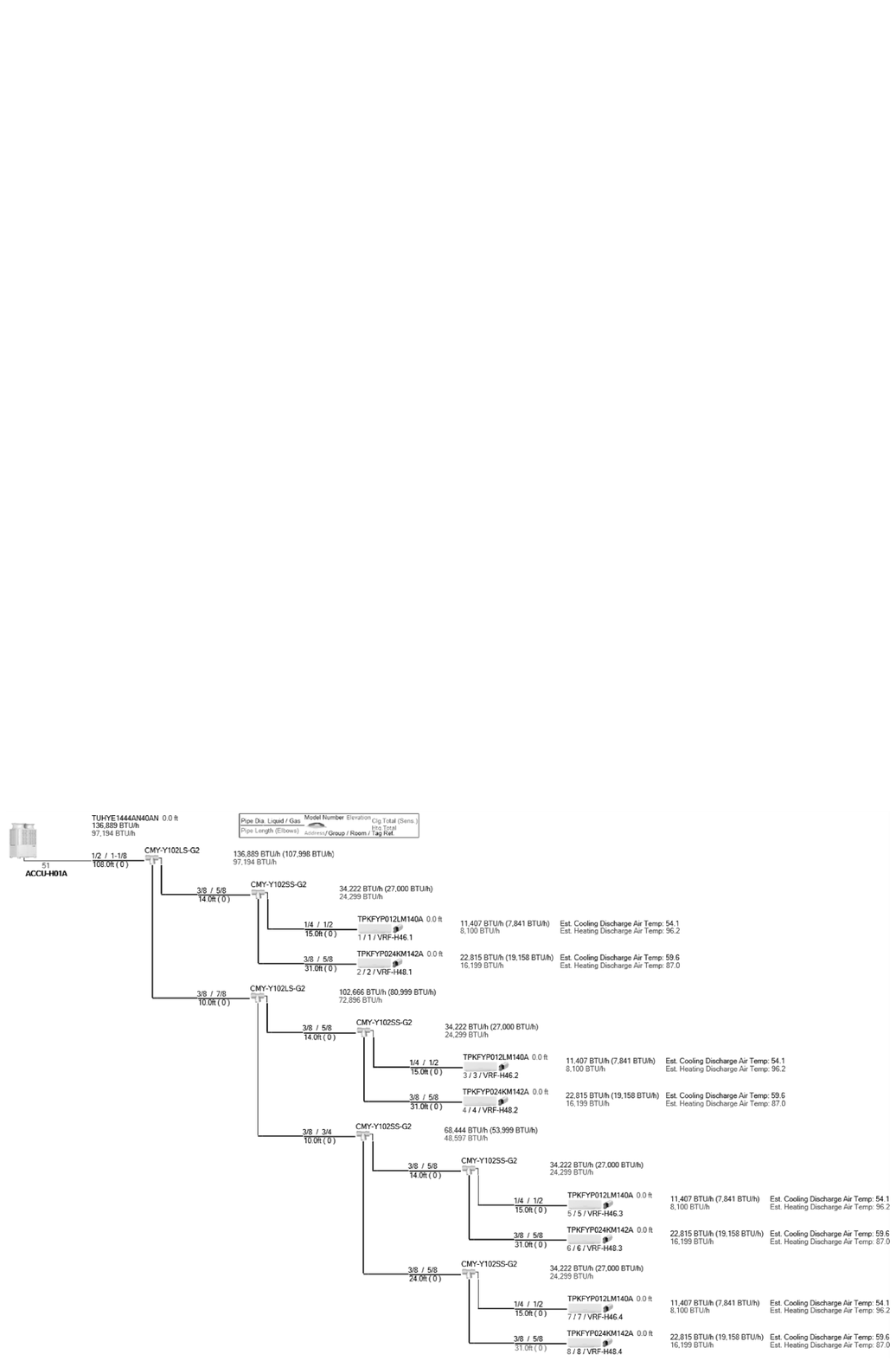
ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	NTS
REVISIONS	

HVAC RISER DIAGRAM

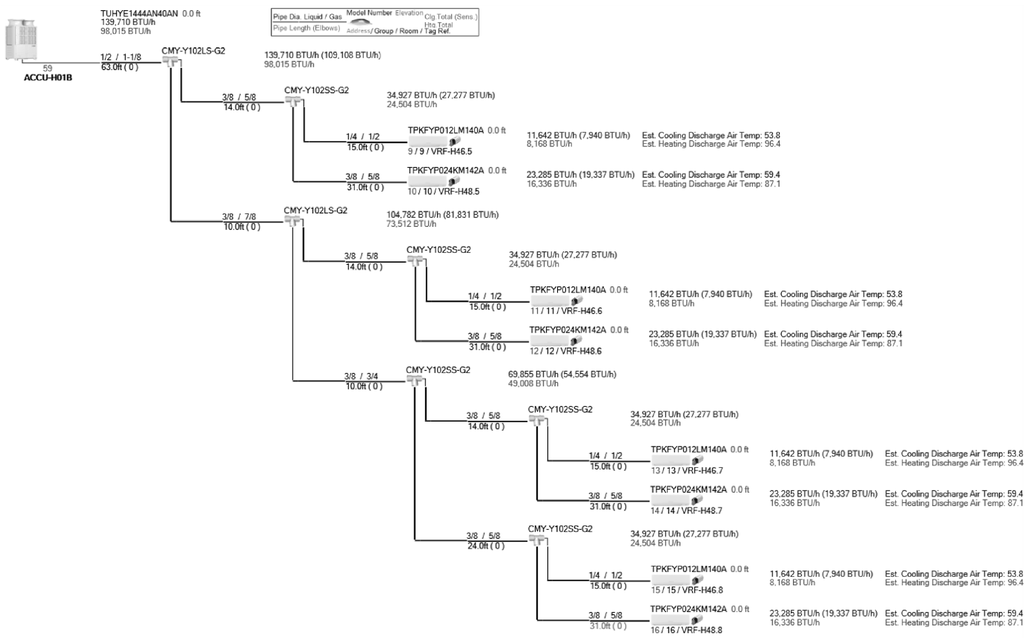
M-703

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1 HVAC PIPING DIAGRAM - 01
NTS



2 HVAC PIPING DIAGRAM - 02
NTS

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NORTH CAROLINA PROFESSIONAL 039457 ENGINEER EDWARD DALTON
1/30/2023

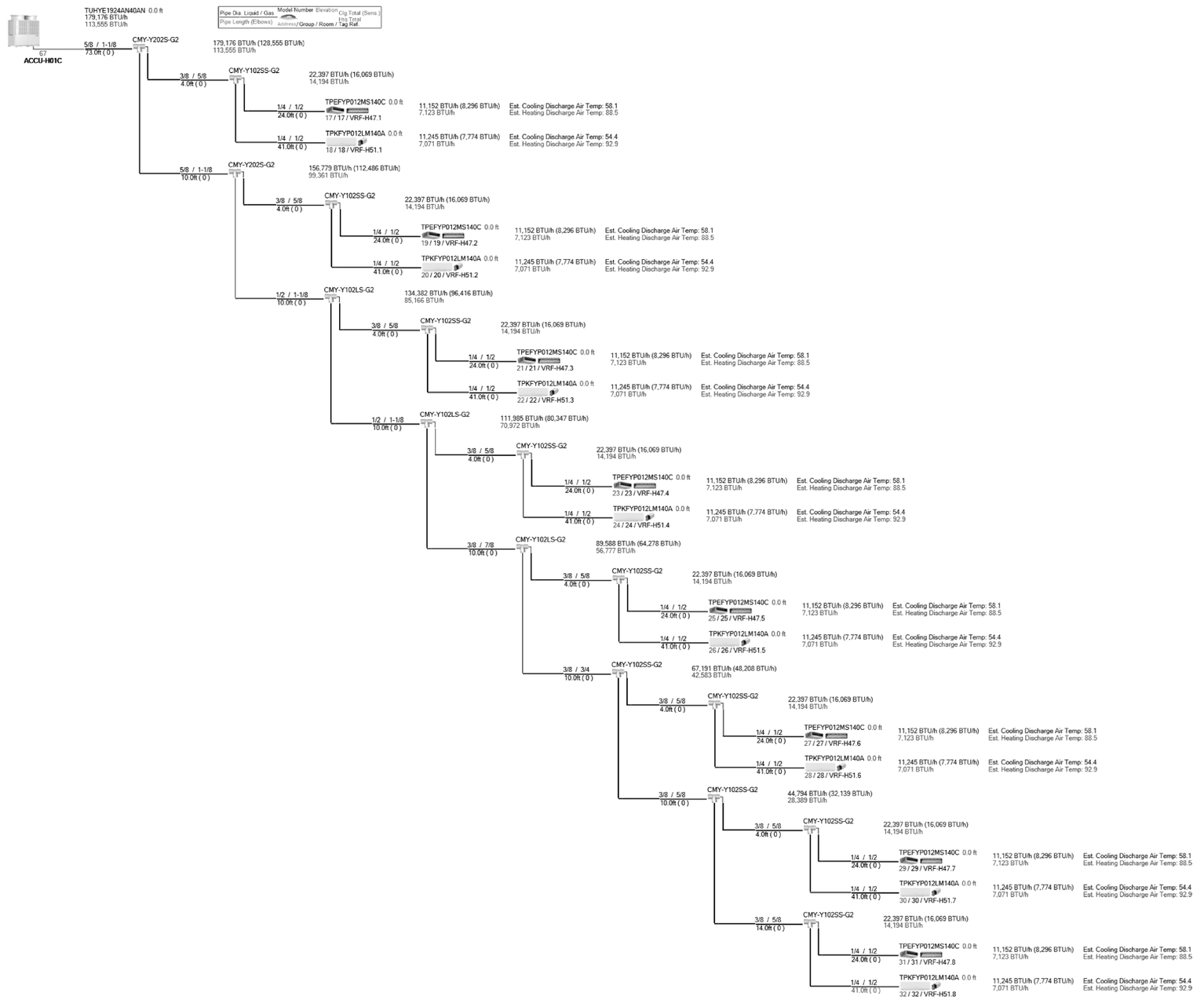
ISSUE	12/22/2022
JOB	30611.00
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REVISIONS	

HVAC PIPING DIAGRAM

M-704

1/30/2023 11:21:23 AM
DRAWING PRINTED FULL SIZE (36"h) - DO NOT DRAW/MEASURE/SCALE FROM SHEETS PLOTTED ON ALL FILES EXCEPT 24" BY 36" AND 30" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR/EQUIVALENT AND CHANGE THE NUMERATOR TO 1. EXAMPLE 3/4"=1'-0" AT 1/2 SCALE WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 2 AND MAKING THE NUMERATOR 2 FOR EXAMPLE 1-1/4"=1'-0" AT 1/2 SCALE WILL BE 5/8"=1'-0". FOR SCALES AT 24" BY 36" AND 30" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR/EQUIVALENT AND CHANGE THE NUMERATOR TO 1. EXAMPLE 3/4"=1'-0" AT 1/2 SCALE WILL BE 3/8"=1'-0". FOR SCALES AT 24" BY 36" AND 30" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR/EQUIVALENT AND CHANGE THE NUMERATOR TO 1. EXAMPLE 1-1/4"=1'-0" AT 1/2 SCALE WILL BE 5/8"=1'-0". FOR SCALES AT 24" BY 36" AND 30" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR/EQUIVALENT AND CHANGE THE NUMERATOR TO 1. EXAMPLE 1-1/2"=1'-0" AT 1/2 SCALE WILL BE 3/4"=1'-0".

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1 HVAC PIPING DIAGRAM - 03
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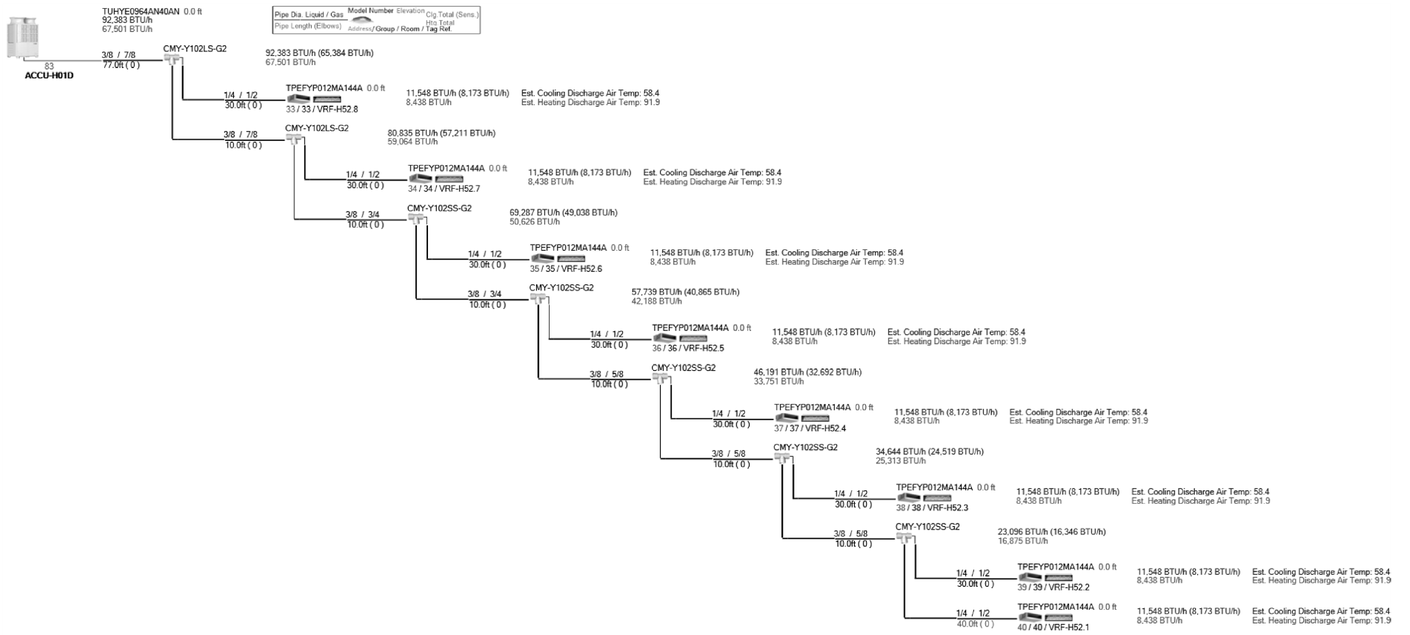
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HVAC PIPNG DIAGRAM

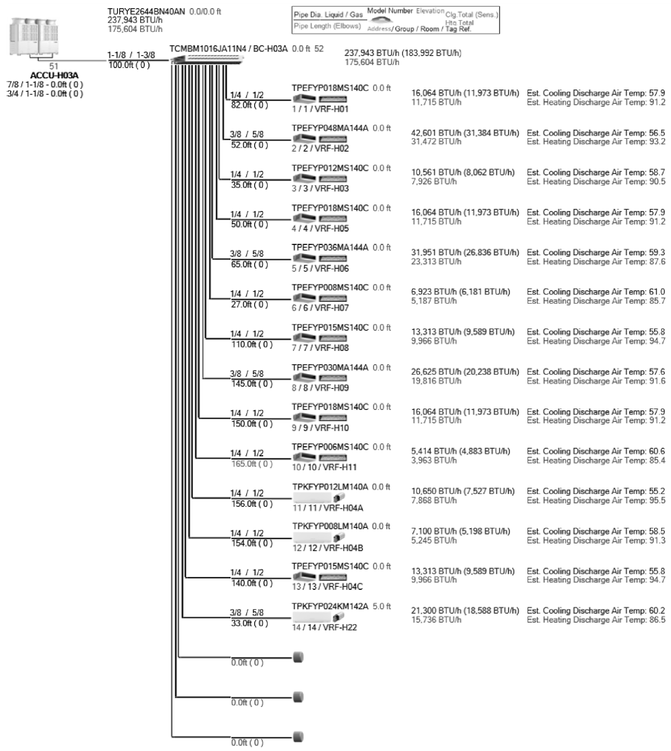
M-705

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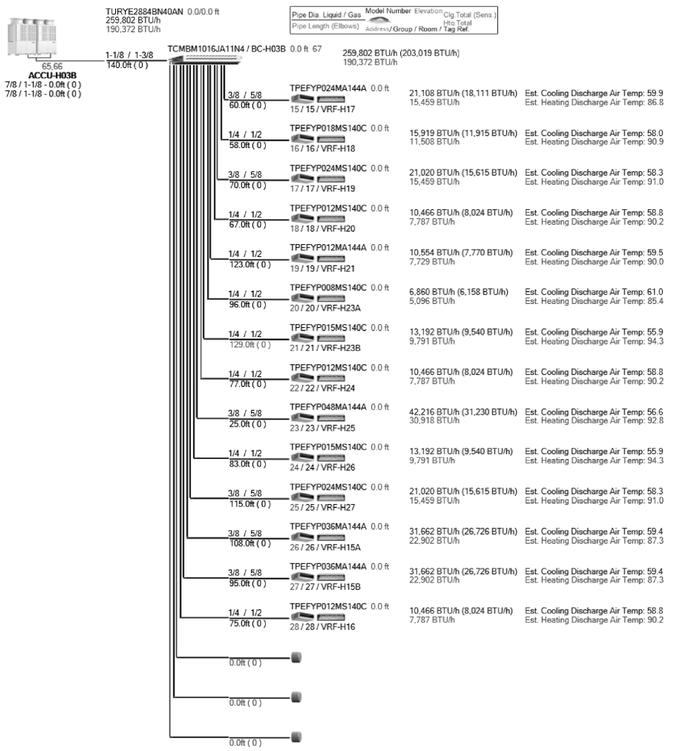
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1 HVAC PIPING DIAGRAM - 04
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2 HVAC PIPING DIAGRAM - 05
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3 HVAC PIPING DIAGRAM - 06
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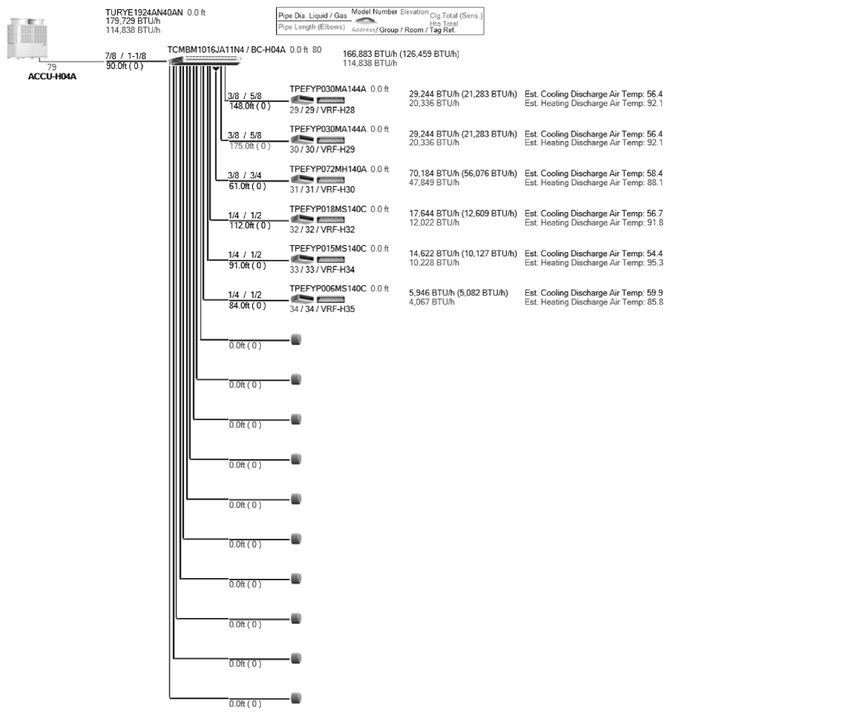
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HVAC PIPING DIAGRAM

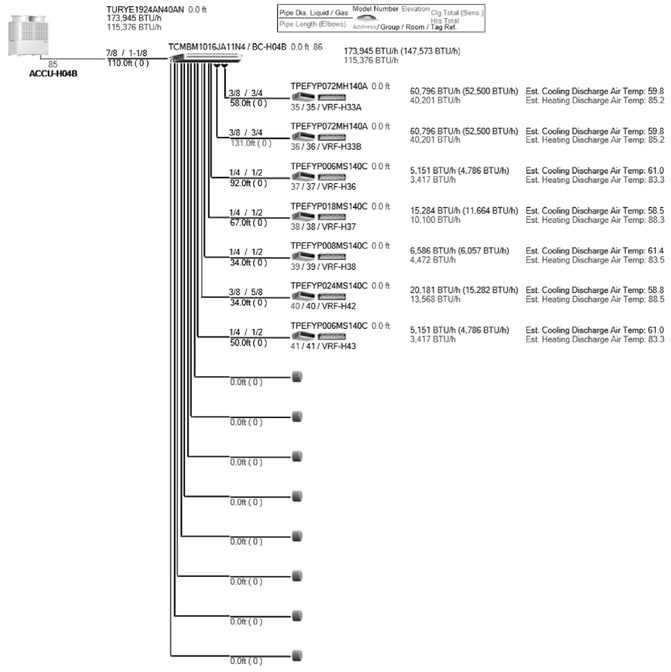
M-706

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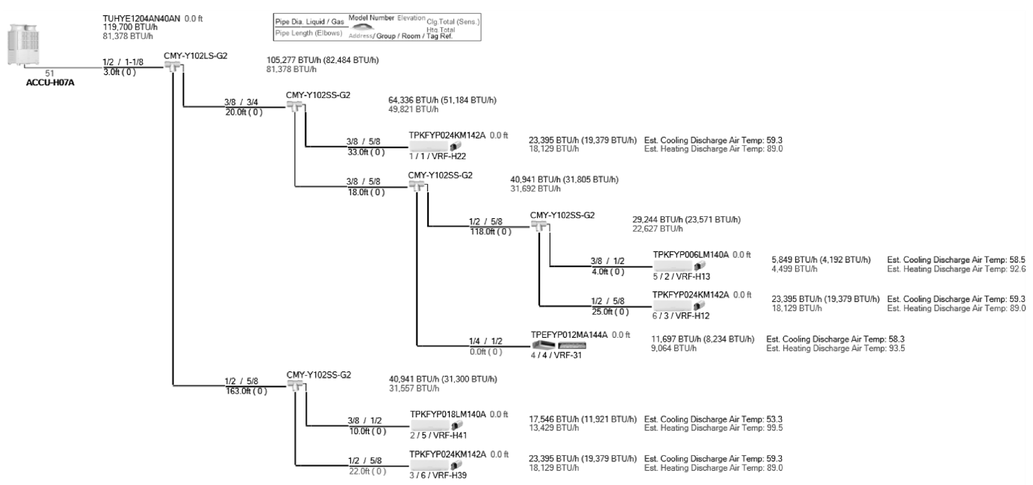
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1 HVAC PIPING DIAGRAM - 07
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2 HVAC PIPING DIAGRAM - 08
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3 HVAC PIPING DIAGRAM - 09
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4 HVAC PIPING DIAGRAM - 10
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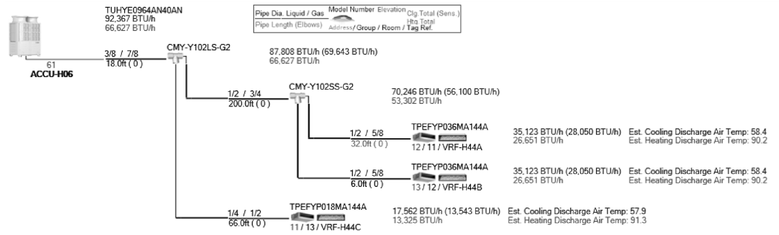
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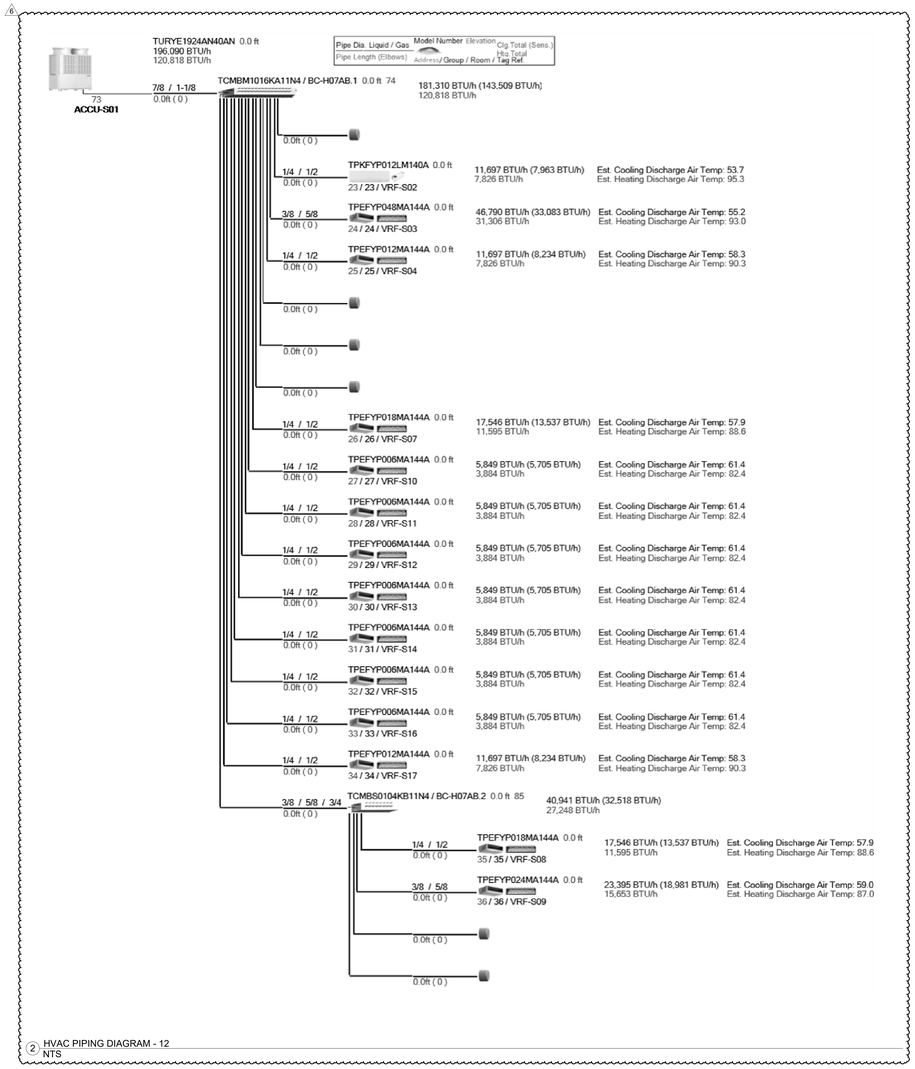
HVAC PIPING DIAGRAM

M-707

1/30/2023 11:21:32 AM
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1 HVAC PIPING DIAGRAM - 11
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2 HVAC PIPING DIAGRAM - 12
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BULLETIN 02
03/15/2023

ISSUE 01/31/2023
JOB 30611.00
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SCALE NTS

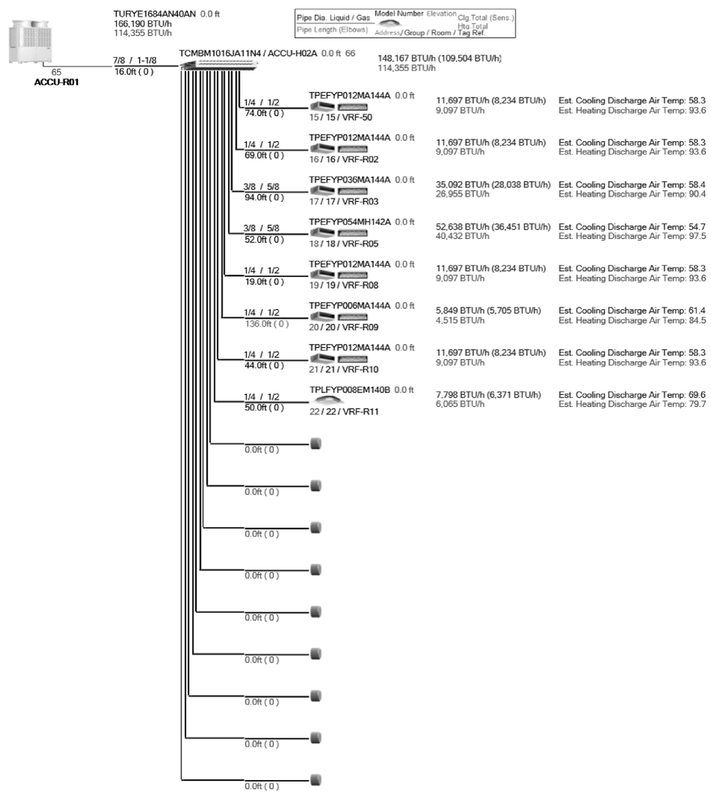
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6	2023-0315	BULLETIN 02

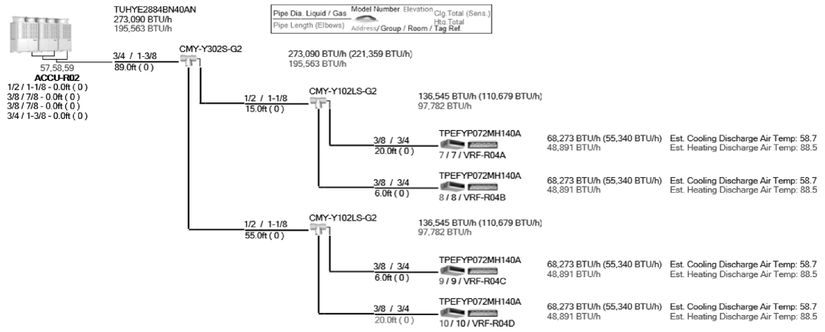
HVAC PIPING DIAGRAM

M-708

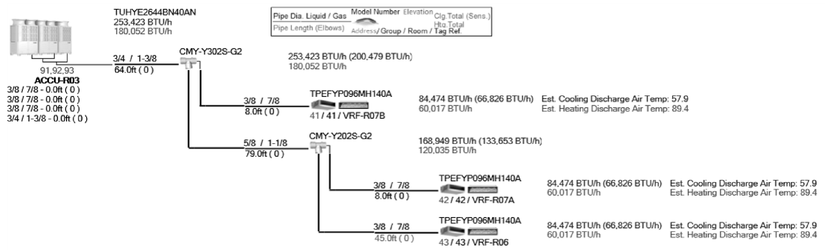
3/14/2023 10:39:08 AM DRAWING PRINTED FULL SIZE (30IN) - 3/4"=1'-0" DRAWING PRINTED HALF SIZE (15IN) - 1/8"=1'-0" FOR SCALES AT 24" X 36" AND 1/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR ESSENTIALLY AND CHANGE THE NUMERATOR TO 3 : 1 SHEETS 24"=1'-0" (1/2"), WILL BE SHRUNK TO 12"=1'-0"



1 HVAC PIPING DIAGRAM - 13
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2 HVAC PIPING DIAGRAM - 14
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3 HVAC PIPING DIAGRAM - 15
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BULLETIN 02
03/15/2023

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6

HVAC PIPING DIAGRAM

M-709

3/14/2023 10:39:10 AM DRAWING PRINTED FULL SIZE (30"H) - IN HAF: DRAWING PRINTED HALF SIZE (15"H) ON ALL 8.5x11 SHEET. 1" ON HF WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED SCALE: 1" = 1'-0" FOR SCALES AT 24", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DIGITALLY AND CHANGE THE NUMERATOR BY HAND MAKING THE NUMBER FOR EXAMPLE 1-3/4"=1'-0" (21.0"). WILL BE 3/4"=1'-0" FOR SCALES AT 24", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DIGITALLY AND CHANGE THE NUMERATOR (3/16") = 1'-0" (16.0"). WILL BE 3/4"=1'-0" (12.0"). WILL FIT ON A SHEET 1" (INCH)" WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15"H) - IN HAF: DRAWING PRINTED FULL SIZE (30"H) - IN FULL:

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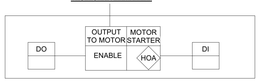
SEQUENCE OF CONTROLS - STANDBY POWER

1. THE FOLLOWING OUTLINE DEFINES THE SEQUENCE OF OPERATION FOR THE BUILDING HVAC SYSTEMS CONNECTED TO THE STANDBY/OR EMERGENCY POWER SYSTEMS.
2. THE BAS SHALL PICK UP A CONTACT CLOSURE AT THE EMERGENCY POWER AUTOMATIC TRANSFER SWITCH OR GENERATOR SWITCHGEAR FOR LOSS OF MAIN UTILITY POWER AND SHALL PERFORM SEQUENCES OUTLINED ON THE CONTRACT DOCUMENTS TO INSURE LIFE SAFETY SYSTEMS OPERATE AS SPECIFIED. THIS INPUT SHALL BE PROVIDED INDEPENDENTLY TO AT LEAST TWO DDCFP. STANDBY POWER SEQUENCES SHALL BE ENABLED ONLY AFTER LIFE SAFETY SYSTEMS ARE OPERATIONAL.
3. UPON INITIAL LOSS OF NORMAL POWER AS DETERMINED BY THE BAS, ALL HVAC EQUIPMENT IN THE BUILDING SHALL SHUT DOWN AND ALL ASSOCIATED DEVICES SHALL GO TO THEIR FAIL SAFE POSITIONS.
4. UPON INDICATION THAT GENERATOR IS ON LINE FOR LIFE SAFETY LOADS, THE BAS SHALL DISABLE THE SHUTDOWN COMMAND FOR LIFE SAFETY EQUIPMENT ENABLING THE EQUIPMENT TO START IF REQUIRED. HVAC LIFE SAFETY EQUIPMENT SHALL NOT START UNLESS SIGNALED TO START BY THE BAS AS DESCRIBED IN THE INDIVIDUAL SEQUENCES. LIFE SAFETY EQUIPMENT SHALL INCLUDE STAIR PRESSURIZATION & ATRIUM SMOKE EXHAUST FANS. IF THE LIFE SAFETY EQUIPMENT IS ON LINE BEFORE A POWER FAILURE IT SHALL AUTOMATICALLY RESTART UPON GENERATOR STARTUP.
5. UPON A SIGNAL FROM THE GENERATOR CONTROL PANEL THAT EMERGENCY POWER IS AVAILABLE, THE BAS SHALL SEQUENCE THE STARTUP OF EQUIPMENT THROUGHOUT THE FACILITY AS DESCRIBED IN THE INDIVIDUAL SEQUENCES. THE FOLLOWING IDENTIFIES THE PRIORITY SEQUENCE OF HVAC EQUIPMENT STARTUP. AFTER THE SPECIFIC ITEM IS STARTED THE START SEQUENCE FOR THE NEXT PIECE OF EQUIPMENT SHALL BE INITIATED. THE BAS SHALL PROVIDE A 1 MINUTE DELAY (ADJUSTABLE) BETWEEN THE START OF EACH PIECE OF EQUIPMENT LISTED BELOW:

1 A. BAS POWER CIRCUITS & NON-BAS CONTROLLED SYSTEMS
B. GENERATOR FUEL OIL AND HVAC SYSTEMS
C. BUILDING HEATING SYSTEMS
D. OTHER SYSTEM CONNECTED TO STANDBY OR EMERGENCY POWER.

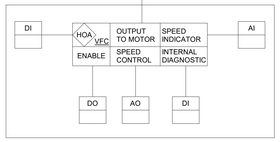
TYPICAL VARIABLE FREQUENCY CONTROLLER AND MOTOR STARTER CONTROL POINTS

MOTOR STARTER



SYMBOL USED TO REPRESENT MOTOR STARTER

VARIABLE FREQUENCY CONTROLLER



SYMBOL USED TO REPRESENT VARIABLE SPEED CONTROLLER

VIRTUAL POINTS:

VARIABLE FREQUENCY CONTROLLER MANUFACTURER COMMUNICATION CHIP/CARD MAY BE USED IN LIEU OF ANY HARD WIRED POINTS INDICATED. COMMUNICATE THE FOLLOWING INTEGRATED POINTS TO THE BAS:

a. SPEED INDICATION
b. AUTO / OUT OF AUTO INDICATION
c. FAULT / FAULT CODE
d. MOTOR CURRENT
e. DRIVE TEMPERATURE
f. DC BUS VOLTAGE
g. POWER DEMAND (kW)

NOTES ON VARIABLE FREQUENCY CONTROLLERS:

THE HAND-OFF-AUTOMATIC SWITCH ON THE VFC SHALL PROVIDE FOR THE FOLLOWING BASIS OF CONTROL:

a. HAND POSITION: THE BAS SHALL HAVE NO CONTROL OVER THE MOTOR SPEED NOR SHALL IT BE ABLE TO START OR STOP THE MOTOR (EXCEPT FOR SAFETY PURPOSES WHERE THE MOTOR SHALL SHUT DOWN). THE MOTOR SHALL RUN UNDER SPEED CONTROL FROM THE HAND POTENTIOMETER ON THE VSD. ALL SAFETIES CONTROLLING THE SHUTDOWN SHALL BE OPERATIONAL (i.e. SMOKE DETECTORS, PRESSURE SWITCHES, ETC). TEMPERATURE AND HUMIDITY CONTROL SHALL BE AVAILABLE THROUGH THE BAS.
b. OFF POSITION: THE MOTOR SHALL BE OFF. THE BAS SHALL NOT CONTROL THE MOTOR. ALL OTHER CONTROL POINTS SHALL BE IN THEIR FAIL-SAFE POSITION.

AUTOMATIC POSITION: THE MOTOR SHALL BE CONTROLLED BY THE BAS.

ALL ELECTRICAL DISCONNECTS ON EQUIPMENT SERVED BY VARIABLE SPEED CONTROLLER SHALL HAVE A SWITCH IN THE ELECTRICAL DISCONNECT WHICH REPORTS DISCONNECT POSITION. THIS SWITCH SHALL BE IN THE PERMISSIVE CIRCUIT OF THE VARIABLE SPEED CONTROLLER.

SENSOR LEGEND

REFER TO PLANS FOR SPACE TEMPERATURE, HUMIDITY, PRESSURE AND CARBON DIOXIDE SENSORS/TRANSMITTERS INDICATED BY THE FOLLOWING SYMBOLS:

TEMPERATURE SENSOR/TRANSMITTER =	T
HUMIDITY SENSOR/TRANSMITTER =	H
PRESSURE SENSOR/TRANSMITTER =	P
EQUIPMENT ALARM CABLE LOCATION = (1 CABLE WITH 8 CONDUCTORS)	A
CARBON DIOXIDE SENSOR =	C
AIRFLOW DIRECTION INDICATOR =	ADI
ALARM STROBE/HORN =	
SMOKE DETECTOR =	SDET

HVAC CONTROL SYSTEM NOTES - GENERAL

HVAC DDC SYSTEM GENERAL REQUIREMENTS:

1. THE DESIGN INTENT IS FOR THE DIRECT DIGITAL CONTROLS (DDC) SYSTEM TO MONITOR PRESSURES, TEMPERATURES AND FLOWS AND TO CONTROL THE VARIOUS COMPONENTS OF THE HVAC SYSTEM INCLUDING BUT NOT LIMITED TO CHILLERS, VALVES, VARIABLE FREQUENCY CONTROLLERS (VFCS), AIR HANDLING UNITS (AHUS), PUMPS, ETC.... MONITORED DATA WILL BE USED TO ENERGIZE OR DE-ENERGIZE EQUIPMENT IN ACCORDANCE WITH THE SEQUENCES OUTLINED.
2. SEQUENCES OUTLINED (UNLESS OTHERWISE SPECIFIED) SHALL BE PERFORMED BY NETWORK CONTROLLERS, PROGRAMMABLE APPLICATION CONTROLLERS AND APPLICATION SPECIFIC CONTROLLERS CONNECTED TO A CENTRAL DDC SYSTEM. SYSTEM ARCHITECTURE SHALL BE BASED ON A PEER-TO-PEER DISTRIBUTED CONTROL SYSTEM NETWORK. SYSTEM SHALL INTEGRATE OPEN COMMUNICATION PROTOCOL CONTROLLERS. ALL CONTROLLERS SHALL BE CAPABLE OF INDEPENDENT OPERATION REGARDLESS OF THE STATUS OF THE DDC SYSTEM WORKSTATION.
3. ALL HVAC EQUIPMENT SHALL BE STARTED/ENABLED AND STOPPED/DISABLED THROUGH THE DDC SYSTEM.
4. AFTER INITIAL STARTUP DDC SYSTEM SHALL AUTOMATICALLY CONTROL OPERATING MODE FOR ALL EQUIPMENT VIA PROGRAMMABLE SCHEDULES INDICATED IN INDIVIDUAL ZONE OR EQUIPMENT SEQUENCES.
5. DDC SYSTEM CONTRACTOR SHALL BE FULLY RESPONSIBLE TO PROVIDE EQUIPMENT AND PROGRAMMING NEEDED TO PERFORM ALL SEQUENCES. WHERE PACKAGED EQUIPMENT IS USED, DDC SYSTEM CONTRACTOR SHALL COORDINATE WITH THE PACKAGED EQUIPMENT CONTROL PANEL FEATURES. DDC SYSTEM CONTRACTOR MAY USE PACKAGED EQUIPMENT CONTROLLER FUNCTIONS WHERE AVAILABLE TO PERFORM SEQUENCES SUBJECT TO FULL COMPLIANCE WITH ALL SEQUENCES AND ALARM MONITORING INDICATED ON THE DRAWINGS. COMMUNICATIONS INTERFACE INCLUDING SOFTWARE BETWEEN THE DDC SYSTEM AND EACH EQUIPMENT MANUFACTURER SUPPLIED CONTROL PANEL SHALL BE PROVIDED BY THE DDC SYSTEM CONTRACTOR. DDC SYSTEM SHALL BE CAPABLE OF READING AND DISPLAYING ALL DATA (INPUT AND OUTPUT) USED BY THE EQUIPMENT MANUFACTURER CONTROL PANEL. SOFTWARE INTERFACE SHALL BE THROUGH LONMARK OR BACNET COMPLIANT OPEN PROTOCOL. PACKAGED EQUIPMENT MIGHT INCLUDE BUT IS NOT LIMITED TO:
   a. VRF SYSTEMS
   b. DX SPLIT SYSTEMS
   c. PACKAGED AIR HANDLING UNITS
6. ADDRESS IDENTIFIERS FOR ALL POINTS AND VARIABLES SHALL BE COORDINATED WITH EXISTING CONTROLS AND SHALL BE APPROVED BY THE FACILITY OWNER.
7. ABILITY TO REVIEW ALL MEASURED DATA, CONTROL SETPOINTS AND FUNCTIONS SHALL BE PROVIDED AT DDC SYSTEM WORKSTATION AND ON LAPTOP SERVICE TOOL.
8. DDC SYSTEM CONTRACTOR SHALL PROVIDE ALL POWER WIRING AND CONNECTIONS REQUIRED TO OPERATE THE DDC SYSTEM AND ALL CONTROL COMPONENTS AND SHALL COMPLY WITH REQUIREMENTS OF DIVISION 26 SECTIONS. ELECTRICAL CIRCUITS FOR ALL CONTROLS SHALL BE DEDICATED ONLY TO THE DDC SYSTEM AND COMPONENTS. ALL WIRING FROM AND INCLUDING DEDICATED CIRCUIT BREAKERS TO THE POINT OF USE SHALL BE PROVIDED BY THIS SECTION.
   a. WHERE REQUIRED BY SPECIFICATIONS OR OTHERWISE, CONTROL SYSTEM INCLUDING HEAD END WORKSTATION SHALL BE PROVIDED WITH STANDBY POWER TO PERFORM SEQUENCES OUTLINED.
   b. CONTROL PANELS, WORK STATIONS AND HOST COMPUTERS SHALL BE WIRED TO STANDBY POWER WHEN OPERATION OF EQUIPMENT BEING CONTROLLED IS CONNECTED TO STANDBY POWER.
   c. DDC SYSTEM SHALL MONITOR GENERATOR SWITCHGEAR TO OBTAIN STATUS OF NORMAL (STREET) POWER. INPUT SHALL BE PROVIDED INDEPENDENTLY TO AT LEAST TWO NETWORK CONTROLLERS.
9. SAFETIES SHALL BE HARDWIRED TO THE CONTROLLED DEVICE UNLESS NOTED OTHERWISE.
10. INDICATED VALUES OF ALL PARAMETERS IN THE SEQUENCES (TEMPERATURES, PRESSURES, FLOW RATES, PERCENTAGES, LIMITS, DEADBANDS, ETC.) ARE NOMINAL VALUES ONLY AND SHALL BE MANUALLY ADJUSTABLE FROM THE DDC SYSTEM. SETPOINTS AND STATUS SHALL BE ADJUSTABLE GLOBALLY AS WELL AS ON AN INDIVIDUAL COMPONENT BASIS. ALL SETPOINTS, DELAYS AND OTHER PARAMETERS SHALL BE ADJUSTABLE BY THE OPERATOR THROUGH THE DDC SYSTEM WORKSTATION AND THROUGH LAPTOP SERVICE TOOL CONNECTED TO CONTROLLERS WITHOUT ANY HARDWARE OR SOFTWARE REVISIONS.
11. PROVIDE ADEQUATE DAMPING OF ALL MODULATING CONTROL LOOPS TO PREVENT HUNTING. ALL CONTROL LOOPS SHALL BE TUNED TO PROVIDE FOR STABLE OPERATION OF THE CONTROL DEVICE. LOOP TUNING MAY BE REQUIRED MULTIPLE TIMES TO STABILIZE MULTIPLE CONTROL SCENARIOS.
12. ALL EQUIPMENT CONTROLLED BY THE DDC SYSTEM SHALL BE CAPABLE OF MANUAL OPERATION THROUGH HAND-OFF-AUTOMATIC (HOA) SWITCHES LOCATED IN THE MOTOR STARTERS OR VARIABLE FREQUENCY CONTROLLERS. DDC SYSTEM SHALL INCLUDE OPTION TO MANUALLY OVERRIDE EACH AUTOMATED SEQUENCE VIA INPUT TO THE DDC SYSTEM.
13. PROVIDE MENU DRIVEN CAPABILITY TO OVERRIDE AUTOMATED START/STOP OR OPERATING MODES FOR EACH PIECE OF EQUIPMENT (INCLUDING AIR HANDLING UNITS, VV BOXES, ETC.) AT CONTROLLERS. IF A SEQUENCE IS DISABLED BY MANUAL INPUT AND THE DDC SYSTEM ATTEMPTS AN AUTOMATED CHANGE IN OPERATING MODE, AN ALARM SHALL BE INITIATED AT THE DDC SYSTEM STATING THAT THE SYSTEM WAS UNABLE TO CHANGE THE MODE DUE TO USER INPUT. WHERE APPLICABLE A MANUAL INPUT COMMAND WILL THEN BE REQUIRED FROM THE USER INSTRUCTING THE DDC SYSTEM TO START THE NEXT SEQUENTIAL PIECE OF EQUIPMENT.
14. ALL SAFETIES AND ALARMS SHALL REMAIN ACTIVE WHEN OPERATING IN MANUAL OVERRIDE MODES.
15. WHEN A UNIT IS OFF-LINE VIA THE BAS START/STOP, THE H-O-A SWITCH, THE SERVICE DISCONNECT, OR ANY OF THE SAFETIES, COMPONENTS SHALL GO TO THEIR FAIL-SAFE POSITIONS. UNLESS INDICATED OTHERWISE IN THE SEQUENCES, THE FAIL-SAFE POSITIONS ARE: ALL THE DAMPERS SHALL BE CLOSED. THE VARIABLE FREQUENCY CONTROLLERS SHALL BE OFF.
16. IN THE EVENT OF A POWER OUTAGE OR UNPLANNED LOSS OF CONTROLS OR UNPLANNED EQUIPMENT SHUTDOWN, EQUIPMENT SHALL GO TO IT'S FAIL SAFE SETTINGS. IF EQUIPMENT IS DEACTIVATED DUE TO NORMAL OCCUPANCY CYCLE OR OCCUPANCY CONTROLS, FAIL SAFE SETTINGS ARE NOT REQUIRED UNLESS SEQUENCE SPECIFIES OTHERWISE.
17. WHENEVER AN ALARM IS INITIATED, THE DDC SYSTEM SHALL RETAIN IN MEMORY THE READING AND SETPOINT OF EACH ASSOCIATED DEVICE TO HELP THE OPERATOR IN ISOLATING THE CAUSE OF THE ALARM.
18. DDC SYSTEM SHALL HAVE THE ABILITY TO TEMPORARILY DISABLE ALARMS RELATED TO A PIECE OF EQUIPMENT TAKEN OFFLINE FOR MAINTENANCE.
19. IF ANY CONTROLLER OR EQUIPMENT MANUFACTURER'S CONTROL PANEL LOSES COMMUNICATION WITH THE DDC SYSTEM NETWORK, AN ALARM SHALL BE INITIATED AT THE DDC SYSTEM INDICATING THE LOCATION OF THE FAULT.
20. ALL CONTROL SYSTEM SENSORS SHALL HAVE HIGH AND LOW LIMIT SOFTWARE ALARMS TO INDICATE FAULTS. ALL ALARMS SHALL INITIATE AUDIBLE AND VISUAL ALARM AT THE DDC SYSTEM WORKSTATION AND AT THE WORKSTATION ALARM PRINTER. ALARM SHALL INDICATE TIME, DATE, SPECIFIC CONTROL POINT AND NATURE OF THE ALARM.
21. COORDINATE ALL SENSOR INSTALLATION LOCATIONS AND SUBMIT PROPOSED POSITIONS ON APPLICABLE PIPING AND DUCTWORK COORDINATION SUBMITTALS. COORDINATE AND ENSURE MANUFACTURER RECOMMENDED UPSTREAM AND DOWNSTREAM PIPE OR DUCT DIAMETERS ARE PROVIDED. SPECIAL ATTENTION IN THIS REGARD IS REQUIRED FOR FLOW MEASURING DEVICES.
22. WHERE CURRENT TRANSMITTERS ARE USED TO DETERMINE FAN OR EQUIPMENT STATUS, A BELT-OFF TEST SHALL BE PERFORMED TO DETERMINE CURRENT LOW POINT TO VERIFY STATUS.
23. ALL WALL MOUNTED TEMPERATURE OR HUMIDITY TRANSMITTERS SHALL HAVE ALL PENETRATIONS SEALED.
24. ALL CONTROL DEVICES SHALL BE INSTALLED IN SUCH A WAY TO BE ACCESSIBLE FOR MAINTENANCE AND REPAIR.
25. ALL COMMON INFORMATION (E.G. OUTSIDE AIR TEMPERATURE AND HUMIDITY) SHALL BE MEASURED IN AT LEAST (2) LOCATIONS AND COMMUNICATED TO INDEPENDENT NETWORK LEVEL CONTROLLERS.
26. UNLESS NOTED OTHERWISE THE FOLLOWING SHALL BE INITIAL SPACE TEMPERATURE AND HUMIDITY SETPOINTS:
   a. NORMALLY OCCUPIED SPACES:
      OCCUPIED COOLING 75 DEGREES F, 50% RH MAXIMUM
      OCCUPIED HEATING 70 DEGREES F, 30% RH MINIMUM
      UNOCCUPIED COOLING 80 DEGREES F, 45% RH MAXIMUM
      UNOCCUPIED HEATING 65 DEGREES F, 35% RH MINIMUM
   b. UTILITY ROOMS (ELECTRICAL ROOMS, PLUMBING ROOMS & PENTHOUSES)
      COOLING OR VENTILATION: 85 DEGREES F (24 HOURS), NO RH LIMIT
      HEATING: 60 DEGREES F MIN (24 HRS), NO RH LIMIT
   c. TELCOM ROOMS:
      COOLING OR VENTILATION: 78 DEGREES F (24 HRS), NO RH LIMIT
      HEATING: 65 DEGREES F (24 HRS), NO RH LIMIT
27. REFER TO INDIVIDUAL SEQUENCES FOR ADDITIONAL VARIABLE SETPOINTS.
28. OCCUPANCY SCHEDULES:
   a. CONSULT WITH BUILDING OPERATORS PRIOR TO SETTING ANY OCCUPANCY SCHEDULES AS MOST PARTS OF THE BUILDING WILL OPERATE 24/7.
   b. OCCUPANCY SCHEDULING SHALL BE CAPABLE OF SCHEDULING BY AREA, ZONE, GROUPS OF ZONES, INDIVIDUALLY CONTROLLED EQUIPMENT AND GROUPS OF INDIVIDUALLY CONTROLLED EQUIPMENT AND GLOBALLY.
   c. EACH SCHEDULE SHALL PROVIDE BEGINNING AND ENDING DATES AND TIMES (HOURS, MINUTES).
   d. A WEEKLY REPEATING SCHEDULE (E.G. BETWEEN 8:00 A.M. AND 6:00 P.M., MONDAY THROUGH FRIDAY) SHALL CONSTITUTE ONE SCHEDULE, NOT FIVE.
   e. DATED SCHEDULES MAY BE ENTERED ANYTIME WITHIN ONE-YEAR IN ADVANCE.
   f. DATED SCHEDULES SHALL BE SELF-DELETING WHEN EFFECTIVE DATES HAVE PASSED.
   g. WHEN A TEMPERATURE OF A ROOM, AREA OR ZONE, SCHEDULED OFF OR UNOCCUPIED, FALLS BELOW 55 F, THE SCHEDULE SHALL BE OVERRIDDEN AUTOMATICALLY, AND THE ZONE SHALL BE OVERRIDDEN TO PROVIDE MINIMUM 55 F SPACE TEMPERATURE AND AN ALARM SHALL BE INITIATED THROUGH THE DDC SYSTEM.
   h. WHEN A TEMPERATURE OF A ROOM, AREA OR ZONE, AS DESCRIBED ABOVE REACHES 55 F PLUS A DEADBAND, THE SCHEDULE IS RESUMED.
   i. LEAP YEARS SHALL BE ADJUSTED AUTOMATICALLY WITHOUT OPERATOR INTERVENTION.
29. AS A MINIMUM, ONE PROGRAMMABLE APPLICATION CONTROLLER SHALL BE PROVIDED FOR EACH AIR HANDLING UNIT.
30. DAMPER END SWITCHES SHALL BE MOUNTED OUTSIDE CONTAMINATED AIRSTREAM FOR ALL LABORATORY EXHAUST SYSTEMS.
31. HISTORIES, TRENDS AND REPORTS
   a. THE DDC SYSTEM SHALL RETAIN IN MEMORY TREND DATA SPECIFIED FOR EACH CONTROL POINT OR VARIABLE. RESOLUTION OF THIS SHALL NOT EXCEED ONE READING PER 15 SECOND INTERVAL.
   b. DDC SYSTEM SHALL RETAIN THREE YEAR (ROLLING) OF DATA FOR ALL CONTROL POINTS IN TEN MINUTE INTERVALS.
   c. USER SHALL BE ABLE TO SELECT TABULAR OR GRAPHICAL OUTPUT OF DATA. GRAPHIC DATA SHALL BE AVAILABLE IN USER SELECTABLE COLOR OR BLACK AND WHITE VERSIONS.
   d. TABULAR DATA SHALL BE MADE AVAILABLE IN COMMA SEPARATED VALUES OR IN FORMAT COMPATIBLE WITH MICROSOFT EXCEL SOFTWARE.

EQUIPMENT SYMBOLS

SYMBOL	DESCRIPTION
	CENTRIFUGAL FAN
	TUBULAR CENTRIFUGAL OR VANEAXIAL FAN
	PROP FAN
	COIL: CC-COOLING COIL; HC-HEATING COIL; RHC-REHEAT COIL; PHC-PREHEAT COIL
	HUMIDIFIER
	FILTER BANK
	AIR FLOW STATION
MS	MOTOR STARTER
VFC	VARIABLE FREQUENCY DRIVE

SYMBOL	DESCRIPTION
	VARIABLE AIR VOLUME TERMINAL BOX OR VALVE WITH REHEAT COIL
	VARIABLE AIR VOLUME TERMINAL BOX OR VALVE
HOA	HANDS-OFF-AUTOMATIC CONTROL STATION
	THREE WAY VALVE ASSOCIATED WITH ACTUATOR - SEE DRAWINGS & SPECS FOR VALVE TYPE
	OPPOSED BLADE DAMPER ASSOCIATED WITH ACTUATOR
	PARALLEL BLADE DAMPER ASSOCIATED WITH ACTUATOR

SYMBOL	DESCRIPTION
	MODULATING ACTUATOR W/ PILOT POSITIONER - FAILS OPEN (PNEUMATIC ACTUATORS ONLY)
	MODULATING ACTUATOR W/ PILOT POSITIONER - FAILS OPEN (PNEUMATIC ACTUATORS ONLY)
	MODULATING ACTUATOR W/ INTEGRAL PILOT POSITIONER (PNEUMATIC ACTUATORS ONLY)
	MODULATING ACTUATOR W/O INTEGRAL PILOT POSITIONER
	MODULATING ACTUATOR W/O PILOT POSITIONER - FAILS OPEN
	MODULATING ACTUATOR W/O PILOT POSITIONER - FAILS CLOSED
	TWO POSITION ACTUATOR - FAILS LAST POSITION
	TWO POSITION ACTUATOR - FAILS OPEN
	TWO POSITION ACTUATOR - FAILS CLOSED

BAS INSTRUMENT LEGEND

	FIRST LETTER(S) PROCESS OR INITIATING VARIABLE	MODIFIER	SUCCEEDING LETTER(S) READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER FLAME		USERS CHOICE(*)	USERS CHOICE(*)	USERS CHOICE(*)
C	USERS CHOICE(*)			CONTROL	
D	DEWPOINT	DIFFERENTIAL		DAMPER	
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO			
G	GAS		GLASS	GATE	
H	HAND (MANUAL)				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME OR SCHEDULE	RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOISTURE	MOMENTARY			
N	USERS CHOICE(*)		USERS CHOICE(*)	USERS CHOICE(*)	USERS CHOICE(*)
O	USERS CHOICE(*)		ORIFICE, RESTRICTION		
P	PRESSURE (OR VACUUM)		POINT (TEST CONNECTION)		
Q	QUANTITY OR EVENT (*)	INTEGRATE	INTEGRATE		
R	RADIATION		RECORD OR PRINT		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE(*)		MULTIFUNCTION(*)	MULTIFUNCTION(*)	MULTIFUNCTION(*)
V	VIBRATION, MECH ANALYSIS			VALVE	
W	WEIGHT OR FORCE		WELL		
X	SMOKE		UNCLASSIFIED(*)	TRANSFORMER	UNCLASSIFIED(*)
Y	EVENT (STATUS)			RELAY OR COMPUTE(*)	
Z	POSITION, DIMENSION			DRIVER, ACTUATOR OR UNCLASSIFIED FINAL CONTROL ELEMENT	

(*) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL, SEE ABBREVIATIONS AND LETTER SYMBOLS. EXAMPLE: PT=PRESSURE TRANSMITTER HS=HAND SWITCH

GENERAL INSTRUMENT/FUNCTION SYMBOLS

CONTROL DEVICE OR INSTRUMENT TAG

XXX
XX
##

SYMBOL MODIFIER OR SETPOINT

DEVICE OR SENSOR TAG ID

WHEN IDENTICAL, MULTIPLE INSTRUMENTS EXIST WITHIN A LOOP, THEY ARE INDIVIDUALLY, SEQUENTIALLY NUMBERED HERE.

BAS INPUT/OUTPUT IDENTIFIER

XY
X=ANALOG(A) OR DIGITAL(D)
Y=OUTPUT(O) OR INPUT(I)

MODIFIER SYMBOLS AND DESCRIPTIONS SHOWN BELOW

OC	OPEN/CLOSE
OO	ON/OFF
SS	START/STOP
AUTO	AUTO
PAL	PRESSURE ALARM LOW LIMIT
PAH	PRESSURE ALARM HIGH LIMIT
TSL	TEMPERATURE ALARM LOW LIMIT
TSH	TEMPERATURE ALARM HIGH LIMIT
MAL	MOISTURE ALARM LOW LIMIT
MAH	MOISTURE ALARM HIGH LIMIT
R	MANUAL RESET

SAMPLE DEVICE TAGS

XS R — DUCT SMOKE DETECTOR WITHAUXILIARY CONTACTS AND MANUAL RESET

MT MAH MAL — HIGH & LOW MOISTURE "OUT OF RANGE" LIMITS FOR FAULTY SENSOR ALARM

XX XX — PILOT LIGHT

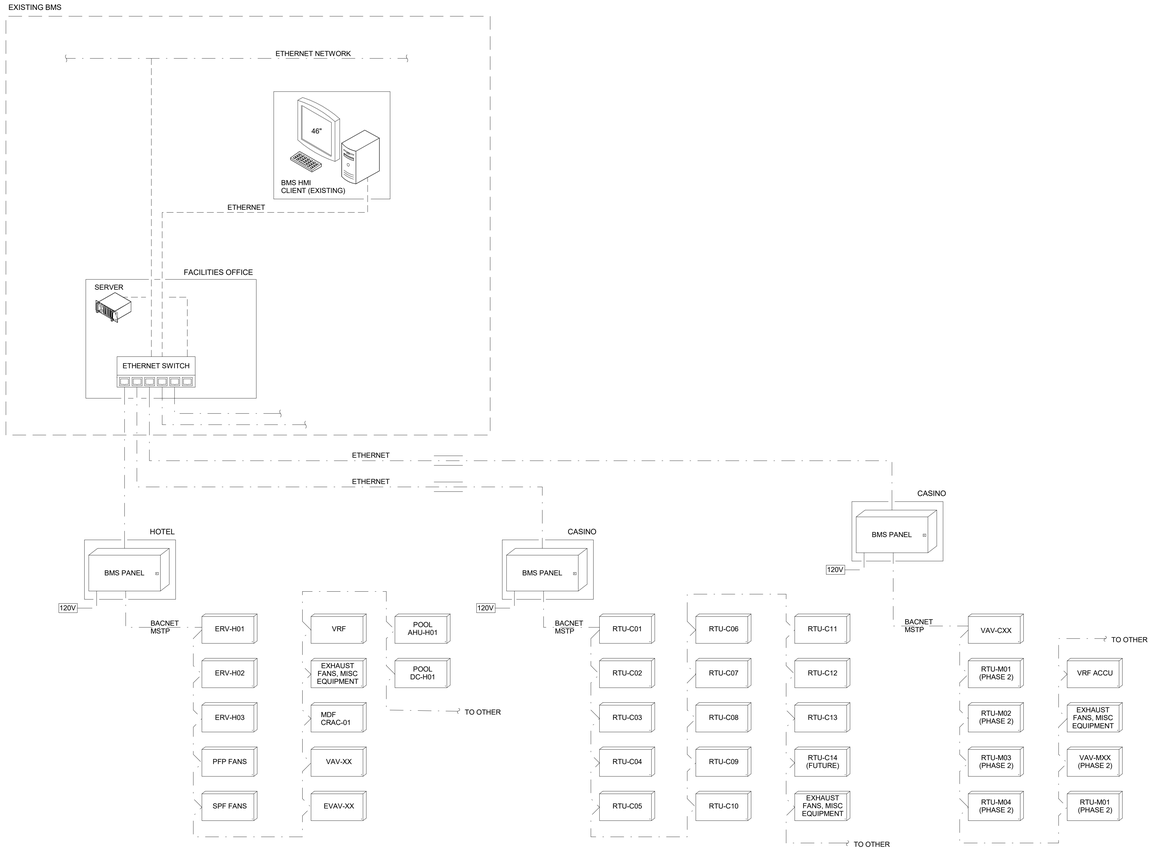
NOTES:

1. INSTRUMENTATION IDENTIFICATION TAGS SHOWN ON THE ENCLOSED CONTROL DRAWINGS ARE INTENDED TO BE SPECIFIC FOR EACH SEQUENCE. NO ATTEMPT HAS BEEN MADE TO COORDINATE SEQUENTIAL TAGS IN ALL SEQUENCES AS THIS EFFORT WOULD NOT AID IN THE UNDERSTANDING OF THE DESIGN INTENT. THEREFORE THERE MAY BE INSTRUMENTS ON THE CONTROL DRAWINGS WHICH APPEAR TO HAVE THE SAME IDENTIFICATION NUMBER.
2. PROVIDE AND COORDINATE A COMPLETE LIST OF INSTRUMENTATION, THE ASSOCIATED IDENTIFICATION TAGS AND A CROSS REFERENCE TO BE USED IN THE BAS (BUILDING AUTOMATION SYSTEM) PROGRAM CODE.

LINETYPE LEGEND

PROCESS LINE

INSTRUMENT LINE



1 BMS SYSTEM NETWORK ARCHITECTURE
CONTROL DIAGRAM

Additions and Renovations to Harrah's Cherokee Valley River

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Murphy, NC 28906

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BULLETIN 06
04/27/2023

NORTH CAROLINA PROFESSIONAL 039457 ENGINEER ERIC HARRALSON
4/27/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	NTS

REVISIONS

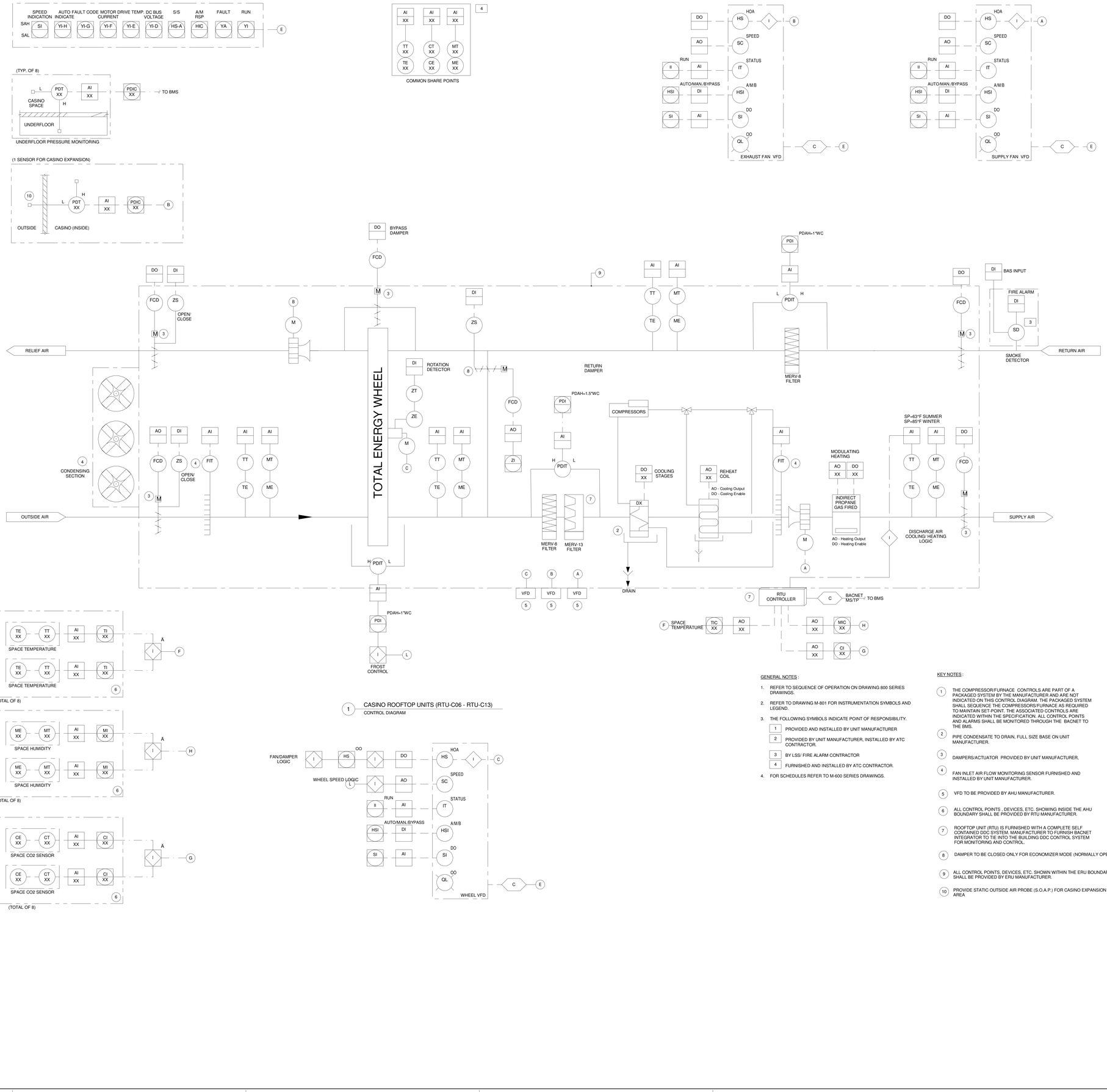
10	2023-0427	BULLETIN 06

HVAC CONTROLS

M-801

4/26/2023 12:15:00 PM DRAWING PRINTED FULL SIZE (30in) = JK'ed* DRAWING PRINTED HALF SIZE (15in) WILL FIT ON A SHEET 1/2 OF WIDTH & 1/2 OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED MUNKA'S THIRD SIZE (13"35) = 11.25"x15.5" WILL FIT EQUATE (W/ 1/4" AT 24", 3/16" AND 3/32" FOR SCALES AT 24", 3/16" AND 3/32" FOR TRANSLATION IS CLOSE ENOUGH TO USE THE ENDOMARTOR DISCRETARY AND CHANGE THE NUMERATOR TO 1. 1/32#"1.5#"1.5#"1.5

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GENERAL NOTES :

1. REFER TO SEQUENCE OF OPERATION ON DRAWING 800 SERIES DRAWINGS.
2. REFER TO DRAWING M-801 FOR INSTRUMENTATION SYMBOLS AND LEGEND.
3. THE FOLLOWING SYMBOLS INDICATE POINT OF RESPONSIBILITY.
   - 1 PROVIDED AND INSTALLED BY UNIT MANUFACTURER
   - 2 PROVIDED BY UNIT MANUFACTURER, INSTALLED BY ATC CONTRACTOR.
   - 3 BY LSS/ FIRE ALARM CONTRACTOR
   - 4 FURNISHED AND INSTALLED BY ATC CONTRACTOR.
4. FOR SCHEDULES REFER TO M-600 SERIES DRAWINGS.

KEY NOTES :

1. THE COMPRESSOR/FURNACE CONTROLS ARE PART OF A PACKAGED SYSTEM BY THE MANUFACTURER AND ARE NOT INDICATED ON THIS CONTROL DIAGRAM. THE PACKAGED SYSTEM SHALL SEQUENCE THE COMPRESSORS/FURNACE AS REQUIRED TO MAINTAIN SET-POINT. THE ASSOCIATED CONTROLS ARE INDICATED WITHIN THE SPECIFICATION. ALL CONTROL POINTS AND ALARMS SHALL BE MONITORED THROUGH THE BACNET TO THE BMS.
2. PIPE CONDENSATE TO DRAIN, FULL SIZE BASE ON UNIT MANUFACTURER.
3. DAMPERS/ACTUATOR PROVIDED BY UNIT MANUFACTURER.
4. FAN INLET AIR FLOW MONITORING SENSOR FURNISHED AND INSTALLED BY UNIT MANUFACTURER.
5. VFD TO BE PROVIDED BY AHU MANUFACTURER.
6. ALL CONTROL POINTS , DEVICES, ETC. SHOWING INSIDE THE AHU BOUNDARY SHALL BE PROVIDED BY RTU MANUFACTURER.
7. ROOFTOP UNIT (RTU) IS FURNISHED WITH A COMPLETE SELF CONTAINED DDC SYSTEM. MANUFACTURER TO FURNISH BACNET INTEGRATOR TO TIE INTO THE BUILDING DDC CONTROL SYSTEM FOR MONITORING AND CONTROL.
8. DAMPER TO BE CLOSED ONLY FOR ECONOMIZER MODE (NORMALLY OPEN)
9. ALL CONTROL POINTS, DEVICES, ETC. SHOWN WITHIN THE ERU BOUNDARY SHALL BE PROVIDED BY ERU MANUFACTURER.
10. PROVIDE STATIC OUTSIDE AIR PROBE (S.O.A.P.) FOR CASINO EXPANSION AREA

Additions and Renovations to Harrah's Cherokee Valley River

777 Casino Parkway
Murphy, NC 28906

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PERMIT SET
01/31/2023

NORTH CAROLINA PROFESSIONAL ENGINEER 039457 EXAMINED DALTON
1/30/2023

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DRAWN	MWM
SCALE	NTS
REVISIONS	

HVAC CONTROLS

M-802

1/30/2023 11:21:41 AM
DRAWING PRINTED FULL SIZE (30"H) - IF NOT 24X36IN PRINTED ANSI C SIZE (22IN.) FILL IT OR SCALE AS APPROPRIATE
IF THIS BAR IS NOT 3" WHEN PLOTTED AT 24" X 36" SHEET SIZE, THE DRAWING HAS BEEN SCALED AND ANY SCALE DEPENDENT INFORMATION MAY BE INCORRECT
IF BAR IS 3" THEN THE DRAWING IS FULL SIZE (30"H) - IF NOT 24X36IN PRINTED ANSI C SIZE (22IN.) FILL IT OR SCALE AS APPROPRIATE
IF THIS BAR IS NOT 1.5" WHEN PLOTTED AT 12" X 18" SHEET SIZE, THE DRAWING HAS BEEN SCALED AND ANY SCALE DEPENDENT INFORMATION MAY BE INCORRECT
IF BAR IS 1.5" THEN THE DRAWING IS HALF SIZE (15"H) - IF NOT 12X18IN PRINTED ANSI B SIZE (11IN.) FILL IT OR SCALE AS APPROPRIATE
IF THIS BAR IS NOT 1" WHEN PLOTTED AT 12" X 18" SHEET SIZE, THE DRAWING HAS BEEN SCALED AND ANY SCALE DEPENDENT INFORMATION MAY BE INCORRECT
IF BAR IS 1" THEN THE DRAWING IS 1/2 SCALE (7.5"H) - IF NOT 12X18IN PRINTED ANSI B SIZE (11IN.) FILL IT OR SCALE AS APPROPRIATE
IF THIS BAR IS NOT 0.5" WHEN PLOTTED AT 12" X 18" SHEET SIZE, THE DRAWING HAS BEEN SCALED AND ANY SCALE DEPENDENT INFORMATION MAY BE INCORRECT

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CASINO ERUs - SEQUENCE OF OPERATION

A. GENERAL:

1. PACKAGED ENERGRY RECOVERY ROOFTOP AIR HANDLING UNITS (RTUs) SHALL CONSIST OF:
   a. UNIT-MOUNTED DIGITAL CONTROLLER.
   b. SUPPLY AIR FAN WITH VARIABLE SPEED MOTOR DRIVE (VFD) .
   c. EXHAUST FAN WITH VARIABLE SPEED MOTOR DRIVE (VFD)
   d. COOLING COILS OF DX COOLING CONTROL BY UNIT CONTROLLER.
   e. PROPANE GAS FIRED HEATING COILS. CONTROL BY UNIT CONTROLLER.
   f. ENERGY RECOVERY ENTHALPY WHEEL WITH VARIABLE SPEED MOTOR DRIVE (VFD)
   g. OUTSIDE AIR DAMPER.
   h. ECONOMIZER CONTROLS.
   i. EXHAUST AIR DAMPER.
   j. BYPASS DAMPER
   k. RETURN DAMPER

B. BUILDING MANAGEMENT SYSTEM (BMS) INTERFACE:

1. THE RTU CONTROLLER SHALL COMMUNICATE VIRTUAL POINTS TO THE BMS. THE SELECTED VIRTUAL POINTS SHALL BE MAPPED TO THE BMS AND SHALL BE READABLE AND/OR WRITABLE THROUGH THE RTU-TO-BMS SERIAL BACNET MS/TP COMMUNICATIONS LINK.

   a. THE BMS SHALL MONITOR DISCHARGE TEMPERATURE AND SETPOINT FROM ERU INTERNAL CONTROLLER'S THROUGH THE BACNET SERIAL LINK.

   b. IF COMMUNICATION IS LOST WITH THE BMS , THE UNIT CONTROLLER SHALL OPERATE USING ITS LAST COMMUNICATED SETPOINTS, RUN COMMAND, AND AN ALARM SHALL BE GENERATED.

C. STARTUP:

1. BMS SHALL START AND STOP THE UNIT.

2. BMS SHALL RUN THE RTU CONTINUOUSLY.

3. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE SUPPLY FAN. THE SUPPLY FAN PROVING SWITCH MUST BE CLOSED WITHIN 40 SECONDS FOR THE FAN TO CONTINUE OPERATION AFTER STARTUP, IF THE SWITCH DOES NOT CLOSE, A FAULT SHALL BE RECORDED AND TRANSMITTED TO THE BAS AND THE UNIT WILL HARD LOCKOUT ON FAN FAULT.

D. SMOKE DETECTION:

1. THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM AT THE BMS UPON RECEIVING A SMOKE DETECTOR STATUS.

E. NORMAL MODE:

1. THE RTU CONTROLLER SHALL PERFORM THE FOLLOWING FUNCTIONS:
   a. ENABLE THE SUPPLY FAN IN RESPONSE TO A BMS HARDWIRED START SIGNAL.
   b. DISABLE THE SUPPLY FAN IN RESPONSE TO A BMS STOP SIGNAL.
   c. WHEEL FROST CONTROL, MODULATE VFD.
   d. CONTROL THE STAGING OF COMPRESSORS TO MAINTAIN COOLING SUPPLY AIR TEMPERATURE (SAT) SETPOINT.
   d. CONTROL THE STAGING OF GAS HEAT TO MAINTAIN HEATING SUPPLY AIR TEMPERATURE (SAT) SETPOINT.
   e. CONTROL THE OUTDOOR AIR,EXHAUST AIR AND BYPASS DAMPERS FOR ENTHALPY BASED ECONOMIZER MODE TO MAINTAIN SAT SETPOINT.

2. THE ERU CONTROLLER SHALL USE A SPACE TEMPERATURE/HUMIDITY INPUTS TO RESET THE DISCHARGE TEMPERATURE.

F. SUPPLY FAN OPERATION:

1. THE CONTROLLER SHALL ENABLE THE SUPPLY FAN TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

G. RTU TEMPERATURE CONTROL:

1. RTUs SHALL ONLY HAVE COOLING AND HEATING TEMPERATURE CONTROL MODE OF OPERATION.

2. THE RTU INTERNAL TEMPERATURE CONTROLLER SHALL ENABLE DX COOLING OR GAS FIRED HEATING AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT.

3. BMS SHALL MONITOR THE SPACE TEMPERATURE/HUMIDITY THRU THE BACNET LINK AND SHALL DISPLAY THE SPACE TEMPERATURE AT THE BMS HMI.

4. THE RTU SAT SETPOINT SHALL BE A WRITABLE VALUE TO THE RTU CONTROLLER FROM THE BMS HMI VIA BACNET.

5. THE RTU CONTROLLER SHALL INITIATE THE HEATING MODE. THE SIGNAL SHALL BE THE SPACE TEMPERATURE. WHENEVER THE RTU IS RUNNING AND THE SPACE TEMPERATURE DROPS BELOW 68 DEG F. (ADJ.) FOR 5 MINUTES (ADJ.) THE BMS SHALL COMMAND THE RTU CONTROLLER TO ENABLE THE GAS HEATING STAGES AS REQUIRED TO MAINTAIN SPACE HEATING SETPOINT. THE HEATING SHALL BE DISABLED BY THE RTU CONTROLLER WHEN THE AVERAGE SPACE TEMPERATURE RISES ABOVE 70 DEG F (ADJUSTABLE).

6. THE CONTROLLER SHALL MONITOR SPACE TEMPERATURE AND SPACE HUMIDITY WITH NIST CERTIFIED SENSORS. ALL OF THE SPACE TEMPERATURE/HUMIDITY SENSORS SHALL BE AVERAGED, AND ALL THE COOLING STAGES, AND GAS HEATING STAGES SHALL BE TURNED ON AND OFF TOGETHER FOR ALL CASINO RTU'S. ECONOMIZER POSITIONS, SETPOINTS AND STAGING SHALL ALSO BE OPERATED TOGETHER. THE SPACE AIR MIXING SOLUTION WILL KEEP THE ENTIRE SPACE AT NEARLY UNIFORM TEMPERATURE.

A 75°F/50%RH (ADJ.) COOLING SETPOINT
A 70°F (ADJ.) HEATING SETPOINT

7. ZONE SETPOINT ADJUST: ZONE TEMPERATURE SETPOINTS SHALL BE ADJUSTABLE AT THE BMS WORKSTATION ONLY, WITH NO OCCUPANT ADJUSTMENT AT THE ZONE SENSOR.

H. VOLUME CONTROL

1. THE SUPPLY AND EXHAUST FANS ARE PROVIDED WITH VFD'S TO PROVIDE A METHOD OF REDUCING ENERGY DURING NIGHT TIMES WHEN THERE IS A REDUCTION IN LOAD AND PEOPLE IN THE SPACE.

2. THE FAN SHALL RUN IN VARIABLE VOLUME FLOW AS SCHEDULED. THE MINIMUM AIR FLOW SHALL ALWAYS EXCEED THE MINIMUM REQUIRED OUTDOOR AIRFLOW AS SCHEDULED.

3. ONCE THE SPACE TEMPERATURE SETPOINT IS MET AND CONFIRMED, THE BMS SHALL MODULATE AIR FLOW THROUGH SUPPLY VFD TO MAINTAIN SPACE SETPONT. DURING THIS TIME BMS SHALL MAINTAIN THE SAME DISCHARGE TEMPERATURE.

I. COOLING MODE

1. THE CONTROLLER SHALL MEASURE THE AVERAGE ZONE TEMPERATURE AND STAGE THE COOLING TO MAINTAIN COOLING SETPOINT. TO PREVENT SHORT CYCLING, THERE SHALL BE A USER DEFINABLE (ADJ.) DELAY BETWEEN STAGES, AND EACH STAGE SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME. THE COOLING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS GREATER THAN 45°F (ADJ.).
- AND THE ECONOMIZER IS NOT ABLE TO MAINTAIN SPACE SETPOINT. ECONOMIZER AND DX COOLING SHALL BE ALLOWED TO OPERATE SIMULTANEOUSLY. SEE ECONOMIZER SECTION FOR ENTHALPY BASED CONTROL.
- AND THE ZONE TEMPERATURE IS ABOVE COOLING SETPOINT.
- AND THE SUPPLY FAN STATUS IS ON.
- AND THE HEATING IS NOT ACTIVE.

J. SUPPLY AIR TEMPERATURE CONTROL (SUMMER)

1. RTU CONTROLLER SHALL CONTROL OF DISCHARGE AIR TEMPERATURE AND BE MAINTAINED WITHIN +/- 2°F OF SETPOINT. THE DISCHARGE TEMPERATURE SETPOINT OF 63°F FOR CASINO (HOT GAS REHEAT) SHALL BE MAINTAINED WHENEVER THE ERU IS OPERATING.

2. RTU CONTROLLER WILL COOL THE AIR DOWN TO THE RANGE OF THE DESIGN TEMPERATURE TO REMOVE THE MOISTURE LOAD AT 55 DB/54WB AND THEN TO REHEAT THE AIR TO A HIGHER TEMPERATURE TO PREVENT OVERCOOLING THE SPACE.

K. GAS HEATING MODE:

1. THE CONTROLLER SHALL MEASURE THE AVERAGE ZONE TEMPERATURE AND STAGE THE HEATING TO MAINTAIN HEATING SETPOINT.

- THE HEATING SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).
- AND THE ECONOMIZER IS AT MINIMUM POSITION.
- AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.
- AND THE SUPPLY FAN STATUS IS ON.
- AND THE COOLING IS NOT ACTIVE.

L. ECONOMIZER MODE:

1. THE RTU CONTROL SYSTEM SHALL HAVE ENTHALPY BASED ECONOMIZER CYCLE. SYSTEM SHALL COMPARE OUTSIDE AIR ENTHALPY WITH EXHAUST AIR ENTHALPY (CALCULATED BY BMS SYSTEM USING TEMPERATURE AND HUMIDITY). WHEN OUTSIDE AIR ENTHALPY IS LESS THAN EXHAUST AIR ENTHALPY, ENTHALPY ECONOMIZER WILL BE AVAILABLE. WHEN ENTHALPY ECONOMIZER IS AVAILABLE, SYSTEM SHALL CLOSE THE RETURN MOTORIZED DAMPER AND OPEN THE OUTSIDE AIR DAMPER TO FULL OPEN POSITION AND DEACTIVATE THE ENERGY RECOVERY WHEEL FROM ROTATING. WHEN OUTSIDE AIR ENTHALPY EXCEEDS EXHAUST AIR ENTHALPY (ADJUSTABLE DEADBAND), DDC SYSTEM SHALL DISENGAGE ECONOMIZER MODE, ENERGY RECOVERY WHEEL BYPASS DAMPERS SHALL BE CLOSED AND THE ENERGY RECOVER WHEEL SHALL ACTIVATE.

2. THE BMS SHALL MONITOR TEMPERATURE, RELATIVE HUMIDITY AND CALCULATED ENTHALPY FOR OA THROUGH THE BACNET LINK.

3. WHEN IN ECONOMIZER MODE THE BMS SHALL INCREASE THE EXHAUST FAN SPEED AND MODULATE THE FAN TO MAINTAIN THE BUILDING PRESSURE SETPOINT.

M. BUILDING PRESSURE CONTROL:

1. THE EXHAUST FAN SHALL MODULATE TO MAINTAIN THE BUILDING PRESSURE SETPOINT.

N. FILTER STATUS:

1. A DIFFERENTIAL PRESSURE INDICATING SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER(S). IF THE SWITCH CLOSES WHEN THE FAN IS RUNNING FOR 1 MINUTE OR AFTER FAN START, A DIRTY FILTER ALARM SHALL BE ANNUNCIATED AT THE BMS HMI.

O. LOSS OF POWER:

1. THE BMS WILL SEND A RE-START COMMAND SIGNAL TO THE RTU CONTROLLER AFTER RECOVERY FROM A POWER FAILURE.

P. SHUTDOWN CONTROL:

1. RTUS SHALL SHUT DOWN BY THE FOLLOWING SIGNALS:
   a. SAFETY CIRCUIT SHUT DOWN (SD) TERMINAL.
   b. FAILED SUPPLY AIR (SA) TEMPERATURE SENSOR.
   c. FAILED RETURN AIR (RA) TEMPERATURE SENSOR.
   d. FAN PROOF.

2. RTUS SHALL ALSO BE MANUALLY SHUTDOWN BY OPERATOR THROUGH BMS HMI.

3. WHEN THE RTU IS STOPPED BY THE BMS BY OPENING THE START (OCCUPIED) CONTACT SIGNAL, THE UNIT'S CONTROLLER WILL PLACE THE RTU IN UNOCCUPIED MODE. TO PREVENT THE RTU FROM STARTING UNDER UNOCCUPIED MODE THE RTU CONTROLLER SETTINGS FOR SETBACK OPERATION SHALL BE DISABLED.

4. THE UNIT'S CONTROLLER SHALL COMMAND THE SUPPLY FAN TO SHUT DOWN INTO UNOCCUPIED MODE AND THE RETURN FAN SHALL ALSO SHUT DOWN AS IT SHALL BE INTERLOCKED TO ALLOW OPERATION ONLY WHEN THE SUPPLY FAN IS RUNNING.

5. A SAFETY SHUTDOWN BY SMOKE DETECTOR WILL REQUIRE THE RTU TO BE MANUALLY STARTED FROM THE BMS HMI AFTER THE SAFETY SHUTDOWN HAS BEEN CLEARED.

Q. CARBON DIOXIDE (CO2) MONITORING:
1. WHEN IN THE OCCUPIED MODE, THE BMS SHALL MONITOR THE SPACE CO2 LEVELS

R. FAN STATUS:

1. THE SUPPLY/EXHAUST FAN RUNNING STATUS SHALL BE PROVIDED BY THE AIR PROVING SWITCH THROUGH THE BACNET LINK.

S. EXHAUST FAN CONTROL:

1. RTU CONTROL SYSTEM SHALL MODULATE THE EXHAUST FAN VFD TO MAINTAIN BUIDING PRESSURE SETPOINT. INITIALLY SET AT +0.05" (ADJ.).

2. THE BMS SHALL MEASURE BOTH BUILDING STATIC PRESSURE AND SHALL BE AVERAGED TO KEEP THE ENTIRE SPACE AT NEARLY UNIFORM TEMPERATURE.

3. THE EXHAUST FAN VFD SPEED SHALL NOT DROP BELOW 20% (adj.) AND SHALL ALSO BE OPERATED TOGETHER.

T. ENERGY RECOVERY WHEEL

1. ENERGY RECOVERY WHEEL SHALL BE CONTROLLED TO MAXIMIZE ENERGY TRANSFER FROM EXHAUST AIR TO SUPPLY AIR.

2. THE ERU CONTROLLER SHALL MONITOR THE ENTERING AND DISCHARGE SIDE OF BOTH THE SUPPLY AND EXHAUST AIR STREAMS FOR DRY BULB AND WET BULB TEMPERATURES.

3. THE ERU CONTROLLER SHALL INTERFACE WITH THE BAS FOR SETPOINT ADJUSTMENT, ALARM, TROUBLE, AND SENSOR VALUES.

4. BAS SHALL TREND ALL SENSED VALUES FOR ALL FOUR (4) AIR MONITORED POINTS BY TIME REFERENCE.

5. THE ENTHALPY WHEEL SHALL MODULATE FOR FROST CONTROL.

6. THE ENTHALPY WHEEL DEFROST CYCLE SHALL BE INITIATE WHEN:

a. WHEN THE OUTSIDE AIR DRY BULB TEMPERATURE IS LOWER THAN THE EXHAUST AIR FROST DRY-BULB TEMPERATURE.

b. IF THE EXHAUST AIR PRESSURE DROP ACROSS THE ENTHALPY RISES ABOVE SETPOINT.

c. THE SYSTEM SHALL REMAIN IN DEFROST CYCLE UNITL THE ENTHALPY PRESSURE DROP RETURNS TO ITS ORIGINAL SETPOINT.

U. HISTORIES/TRENDING & REPORTS

1. THE BAS SOFTWARE SHALL BE CAPABLE OF RECORDING AND PRODUCING REPORTS TO DOCUMENT ALL READINGS ASSOCIATED WITH EACH RTU DEVICE SHOWN. INCLUDE GRAPHING CAPABILITY IN REPORT GENERATING SOFTWARE. DATA RECORDING SHALL BE CAPABLE OF STORING HOURLY READINGS, DAILY AVERAGE READING, WEEKLY AVERAGE READING AND MONTHLY AVERAGE READING. SOFTWARE SHALL ALSO BE CAPABLE OF REPORTING DAILY AND MONTHLY HIGH/LOW PEAK READINGS.

1 SEQUENCE OF OPERATION FOR CASINO ROOFTOP UNITS (RTU-C06 - RTU-C13)
CONTROL DIAGRAM

Additions and Renovations to Harrah's Cherokee Valley River

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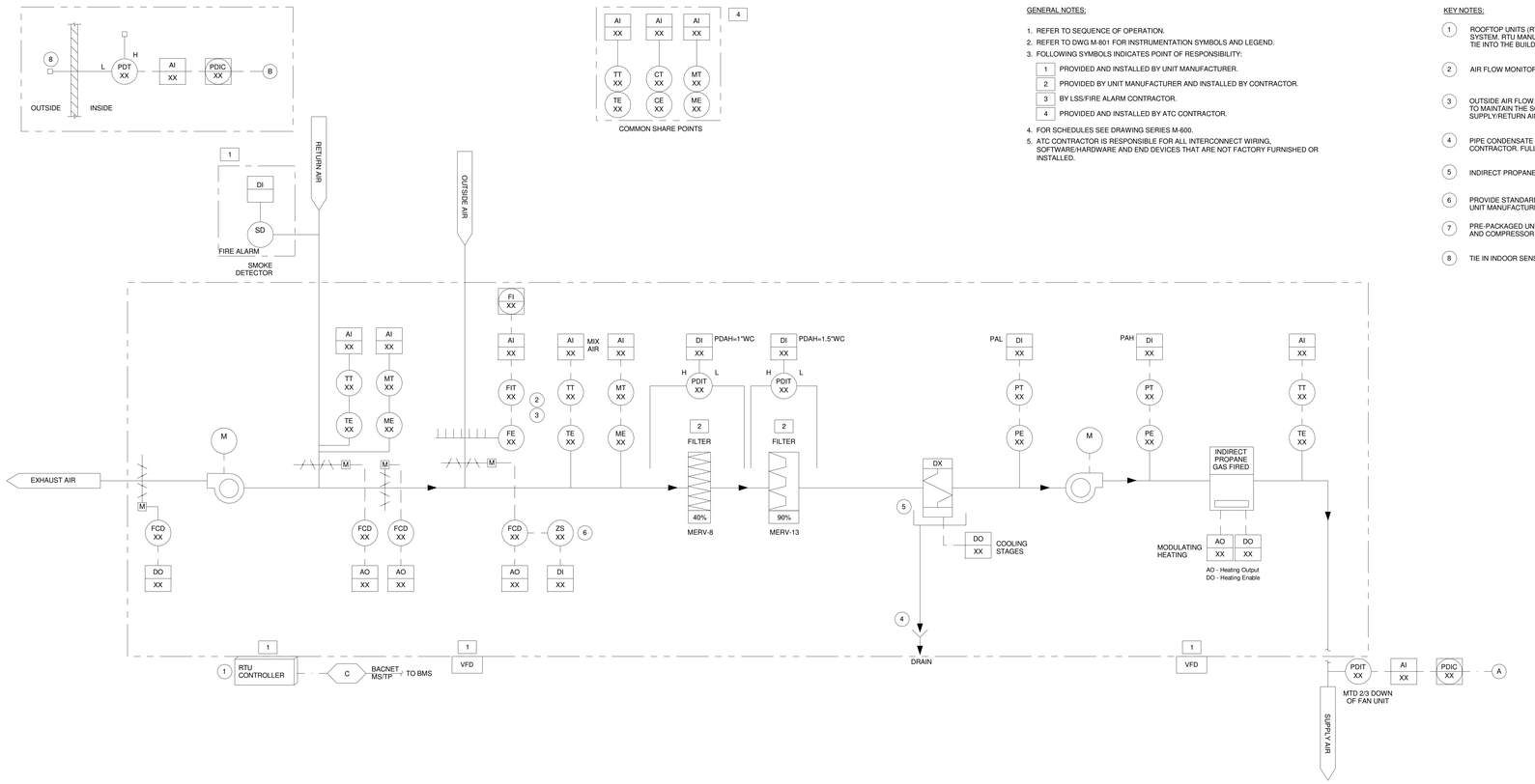
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HVAC CONTROLS

M-803

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GENERAL NOTES:

1. REFER TO SEQUENCE OF OPERATION.
2. REFER TO DWG M-801 FOR INSTRUMENTATION SYMBOLS AND LEGEND.
3. FOLLOWING SYMBOLS INDICATES POINT OF RESPONSIBILITY:
   - 1 PROVIDED AND INSTALLED BY UNIT MANUFACTURER.
   - 2 PROVIDED BY UNIT MANUFACTURER AND INSTALLED BY CONTRACTOR.
   - 3 BY LSS/FIRE ALARM CONTRACTOR.
   - 4 PROVIDED AND INSTALLED BY ATC CONTRACTOR.
4. FOR SCHEDULES SEE DRAWING SERIES M-600.
5. ATC CONTRACTOR IS RESPONSIBLE FOR ALL INTERCONNECT WIRING, SOFTWARE/HARDWARE AND END DEVICES THAT ARE NOT FACTORY FURNISHED OR INSTALLED.

KEY NOTES:

1. ROOFTOP UNITS (RTU) ARE FURNISHED WITH A COMPLETE SELF CONTAINED DDC SYSTEM. RTU MANUFACTURER TO FURNISH BACNET OR LON-WORKS INTEGRATOR TO TIE INTO THE BUILDING DDC CONTROL SYSTEM FOR MONITORING AND CONTROL.
2. AIR FLOW MONITORING STATION FURNISHED AND INSTALLED BY UNIT MANUFACTURER.
3. OUTSIDE AIR FLOW MONITORING STATION SHALL CONTROL THE OUTSIDE AIR DAMPER TO MAINTAIN THE SCHEDULED MIN. VENTILATION RATE, INDEPENDENT FROM THE SUPPLY/RETURN AIR PROPORTIONAL FLOW RATE. (BY ATC CONTRACTOR)
4. PIPE CONDENSATE DRAIN LINES TO ROOF LEVEL SPLASH GUARDS, PROVIDED BY HVAC CONTRACTOR. FULL SIZE BASED ON UNIT MANUFACTURER
5. INDIRECT PROPANE GAS FIRED HEATER.
6. PROVIDE STANDARD MOTORIZED DAMPER WITH END SWITCH PROVIDED AND INSTALLED UNIT MANUFACTURER.
7. PRE-PACKAGED UNIT- REFRIGERANT LINES ARE CONNECTED TO THE UNIT CONDENSER AND COMPRESSOR SECTIONS.
8. TIE IN INDOOR SENSOR TO SAME OUTDOOR SENSOR SHOWN ON SHEET M-802

SEQUENCE OF OPERATION:

A. GENERAL:

1. ROOFTOP AIR HANDLING UNITS SUPPLY THE REQUIRED CONDITIONED SUPPLY AIRFLOWS TO BOH SPACES WITHIN THE BUILDING. ROOFTOP UNITS DX COOLING TYPE WITH R-410A REFRIGERANT AND PROPANE GAS-FIRED HEATING.
2. RTUs ARE A RECIRCULATING TYPE UNITS SERVING THE BOH SPACES AND SHALL RUN 24/7.
3. ROOFTOP AIR HANDLING UNITS ARE PROVIDED WITH BUILT-IN MICROPROCESSOR-BASED DIGITAL CONTROLS FOR SUPPLY AIR TEMPERATURE SETPOINT CONTROL, ENERGY OPTIMIZATION, AND COOLING DEHUMIDIFICATION CONTROL.
4. THE ROOFTOP AIR HANDLING UNIT CONTROLLERS SHALL HAVE FOLLOWING CONNECTIONS TO THE BMS:
   a. BACNET MS/TP NETWORK INTERFACE FOR MONITORING UNIT OPERATION AND PERFORMANCE.
5. THE RTU CONTROLLER'S BACNET MS/TP NETWORK INTERFACE SHALL BE CONFIGURED PER OWNER/ SITE-BMS STANDARDS.
6. OUTSIDE AIR FLOW MEASURING STATIONS (FMS) SHALL BE USED TO MONITOR AND DISPLAY AIR VOLUMES AT THE CONTROL SYSTEM. THE AIRFLOWS SHALL BE USED BY THE CONTROL SYSTEM TO ENSURE MINIMUM OUTSIDE AIR FOR VENTILATION IS MAINTAINED.
7. FILTER STATUS SHALL BE MONITORED BY A DIFFERENTIAL PRESSURE INDICATOR/ TRANSMITTERS PDIT-XX01 AND PDIT-XX02.

B. SAFETIES:

1. THE FOLLOWING SAFETIES, EACH WITH ITS OWN MANUAL RESET BUTTON, SHALL SHUT DOWN UNIT AND THE CONTROL SYSTEM SHALL INITIATE RESPECTIVE ALARM:
   a. RETURN SMOKE DETECTOR (SD) IS ACTIVATED. SMOKE DETECTORS SHALL BE FURNISHED AND WIRED TO THE FIRE ALARM SYSTEM BY OTHERS, ATC CONTRACTOR SHALL MOUNT DETECTORS AND WIRE TO CONTROL SYSTEM.
   b. DISCHARGE STATIC PRESSURE HIGH LIMIT (SPH) INDICATES MORE THAN ALARM SETPOINT STATIC PRESSURE WHEN THE UNIT STATUS IS ON (WITH A 5 MINUTE DELAY).
   c. INTAKE STATIC PRESSURE LOW LIMIT (SPL) INDICATES LESS THAN ALARM SETPOINT NEGATIVE STATIC PRESSURE WHEN THE UNIT STATUS IS ON (WITH A 5 MINUTE DELAY).
   d. DISCHARGE AIR TEMPERATURE SENSOR (DAT) GOES BELOW THE DISCHARGE AIR LOW ALARM SETPOINT WHEN STATUS IS ON.
2. THE CONTROL SYSTEM SHALL INITIATE AN ALARM, DESCRIBING THE ALARM IF ANY OF THE FOLLOWING CONDITIONS ARE MET:
   a. SUPPLY OR EXHAUST FANS ARE COMMANDED TO RUN AND ANYTIME AFTER A 15 SECOND DELAY THE CONTROL SYSTEM SENSES NO STATUS VIA THE FANS CURRENT TRANSFORMER RELAYS (CT).
   b. FILTER DIFFERENTIAL PRESSURE SWITCH (FDPS) SENSES GREATER THAN SETPOINT STATIC PRESSURE DROP FOR 15 MINUTES.
   c. DISCHARGE AIR TEMPERATURE SENSOR (DAT) GOES ABOVE THE DISCHARGE AIR HIGH ALARM SETPOINT FOR 10 MINUTES WHEN STATUS IS ON.
   d. ALL CONTROL SYSTEM SENSORS SHALL HAVE A HIGH AND LOW SOFTWARE ALARM LIMIT TO INDICATE TEMPERATURE PROBLEMS OR A FAULTY SENSOR.
   e. WHENEVER A UNIT IS SHUT DOWN BECAUSE OF ONE OF THE SAFETIES, THE CONTROL SYSTEM SHALL RETAIN IN MEMORY THE READING AND SETPOINT OF EACH DEVICE TO HELP THE OPERATOR IN ISOLATING THE REASON FOR THE PROBLEM.
   f. OUTSIDE AIR VOLUMETRIC FLOW RATE FALLS BELOW SCHEDULED MINIMUM REQUIRED AMOUNT FOR 5 CONSECUTIVE MINUTES (AUDIBLE ALARM SHALL ALSO BE INITIATED).
   g. RTU SUPPLY AND RETURN FAN STATUS SHALL BE MONITORED BY THE BAS VIA CURRENT TRANSMITTERS.
   h. AUXILIARY ALARM CONTACTS IN THE AHU OR RF VARIABLE FREQUENCY DRIVE (VFD) INDICATES A FAILURE OF THE VFD - DELAY 15 SECONDS.

C. RTU TEMPERATURE CONTROL:

1. THE RTU INTERNAL TEMPERATURE CONTROLLER SHALL ENABLE COOLING OR HEATING AS REQUIRED TO MAINTAIN A SUPPLY AIR TEMPERATURE SETPOINT (55 DEGREES F).
2. THE BMS SHALL MONITOR RTU SUPPLY AIR TEMPERATURE AND SHALL GENERATE AN ALARM AT THE HMI WHENEVER THE RTU SUPPLY AIR TEMPERATURE INCREASES ABOVE OR DECREASES BELOW THE DESIGN OPERATING RANGE (MAX: 60° F AND MIN: 50° F).
3. THE BAS SHALL CALCULATE A NEW DISCHARGE SET POINT EVERY THIRTY MINUTES (ADJ.) BASED ON THE NUMBER OF COOLING/HEATING REQUESTS. A COOLING REQUEST IS DEFINED AS ANY TERMINAL BOX THAT IS REPORTING ABOVE ZONE SET POINT AT MAXIMUM AIR FLOW. A HEATING REQUEST IS DEFINED AS ANY TERMINAL BOX THAT IS REPORTING BELOW ZONE SET POINT AT HEATING AIR FLOW. THE CALCULATION SHALL BE: NEW SET POINT=55(ADJ.)+0.25(ADJ.)x((-0.25)# CLG RQSTS(ADJ.)) + ((0.25)# HTG RQSTS(ADJ.)). THE RESPOND VALUE IN PARENTHESIS SHALL BE LIMITED TO 1°F (ADJ.) PER THIRTY MINUTE (ADJ.) ITERATION. WHEN THE UNIT INITIATES ECONOMIZER MODE DISABLE THE DISCHARGE TEMPERATURE RESET AND CONTROL TO 55 DEG F (ADJ.).

D. STATIC PRESSURE AND VOLUMETRIC CONTROL:

1. SUPPLY FAN VFD SHALL BE MODULATED TO MAINTAIN STATIC PRESSURE SETPOINT AT THE STATIC PRESSURE SENSOR LOCATED 2/3 OF THE WAY DOWN THE SUPPLY DUCTWORK. AS SYSTEM REQUIREMENTS FOR AIR VOLUME INCREASE AND SYSTEM STATIC PRESSURE AT CONTROLLING SP DROPS BELOW SETPOINT, THE VFD'S SHALL SPEED UP. AS SYSTEM REQUIREMENTS FOR AIR VOLUME DECREASE AS SENSED BY AN INCREASE IN STATIC PRESSURE ABOVE SETPOINT AT THE STATIC PRESSURE SENSOR, THE VFD'S SHALL SLOW DOWN. PROVIDE ADEQUATE DIFFERENTIAL AROUND SETPOINT TO PREVENT EXCESSIVELY RAPID CHANGES IN AIR VOLUME.
2. INITIAL STATIC PRESSURE SETPOINT UPON AHU STARTUP SHALL BE DETERMINED BY CONTROLS CONTRACTOR. STATIC SETPOINT SHALL BE RESET EVERY 5 MINUTES BASED ON TERMINAL BOX DAMPER POSITION AS FOLLOWS.
3. THE BMS SHALL POLL ALL OF THE SUPPLY TERMINAL BOX DAMPER POSITIONS:
   a. IF ANY DAMPER POSITION IS GREATER THAN 90% OPEN, STATIC PRESSURE SETPOINT SHALL BE INCREASED BY 0.05" W.G.
   b. IF NO DAMPER POSITION IS GREATER THAN 70% OPEN STATIC PRESSURE SETPOINT SHALL BE DECREASED BY 0.05" W.G.
   c. UPON SHUT DOWN OF AHU, STATIC PRESSURE SETPOINT SHALL BE RESET TO INITIAL SETPOINT.
4. RTU CONTROL SYSTEM SHALL MODULATE THE EXHAUST FAN VFD TO MAINTAIN BUIDING PRESSURE SETPOINT. INITIALLY SET AT +0.05" (ADJ.).

E. SHUTDOWN CONTROL:

1. IF AN RTU FAILS TO RUN OR SHUTS DOWN, THE FSA-BMS SHALL DE-ENERGIZE THE CONTROL OUTPUT TO THE FAILED RTU AND GENERATE A CRITICAL ALARM AT THE HMI.
2. RTU DISCHARGE TEMPERATURE ALARMING OF RTU'S NOT RUNNING SHALL BE DISABLED.

F. ECONOMIZER OPERATION:

a. IF THE OUTDOOR AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY, THE SYSTEM SHALL INITIATE AN ECONOMIZER MODE. THE AMOUNT OF COOLING REQUIRED SHALL BE DETERMINED BY THE DISCHARGE AIR TEMPERATURE SENSOR. THE OUTDOOR AIR DAMPERS SHALL MODULATE FROM THEIR MINIMUM POSITIONS TO 100% OPEN AND THE RETURN AIR DAMPER SHALL CLOSE PROPORTIONATELY AS REQUIRED TO MAINTAIN DISCHARGE AIR TEMPERATURE (DAT). IF, AFTER A 60 SECOND ADJUSTABLE DELAY, THE ECONOMIZER IS AT MAXIMUM ALLOWABLE POSITION AND DISCHARGE TEMPERATURE IS 2 F DEGREES ABOVE SETPOINT, THE MECHANICAL COOLING SHALL BE STAGED ON AS REQUIRED TO SATISFY DAT. IF THE DISCHARGE AIR TEMPERATURE FALLS BELOW ITS SETPOINT, THE SEQUENCE SHALL BE REVERSED.

b. IF THE OUTDOOR AIR ENTHALPY IS GREATER THAN THE RETURN AIR ENTHALPY, THE SYSTEM SHALL NOT INITIATE ECONOMIZER MODE. THE OUTDOOR AIR AIR DAMPER SHALL BE INDEXED TO THEIR MINIMUM POSITION. THE AMOUNT OF COOLING REQUIRED SHALL BE DETERMINED BY THE SPACE AIR TEMPERATURE SENSOR.

G. EXHAUST FAN CONTROL:

1. RTU CONTROL SYSTEM SHALL MODULATE THE EXHAUST FAN VFD TO MAINTAIN BUIDING PRESSURE SETPOINT. INITIALLY SET AT +0.05" (ADJ.).
2. THE BMS SHALL MEASURE BOTH BUILDING STATIC PRESSURE AND SHALL BE AVERAGED TO KEEP THE ENTIRE SPACE AT NEARLY UNIFORM TEMPERATURE.
3. THE EXHAUST FAN VFD SPEED SHALL NOT DROP BELOW 20% (adj.) AND SHALL ALSO BE OPERATED TOGETHER.

H. MINIMUM OUTSIDE AIR VENTILATION:

1. THE OUTSIDE AIR DAMPERS SHALL MAINTAIN A MINIMUM POSITION (ADJ.) DURING BUILDING OCCUPIED HOURS AND BE CLOSED DURING UNOCCUPIED HOURS. UNITS WITH ZONES CONTROLLED BY A LOCAL CO2 SENSOR (RTU-C03 ONLY), THE OAD SHALL MODULATE TO MAINTAIN THE MINIMUM OUTSIDE AIR CFM. CO2 SENSING SHALL ALLOW THE DAMPER TO REDUCE FURTHER MAINTAINING CO2 LEVEL 400 PPM ABOVE AMBIENT BUT NOT MORE THEN 1000 PPM. (THIS OCCURS ONLY DURING NON-ECONOMIZER MODE).

1 MULTI-ZONE VAV ROOFTOP UNIT RTU-C01, C02, C03 (BOH AREAS)
CONTROL DIAGRAM

Additions and Renovations to Harrah's Cherokee Valley River

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Murphy, NC 28906

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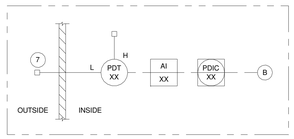
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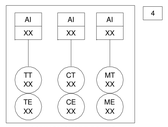
HVAC CONTROLS

M-804

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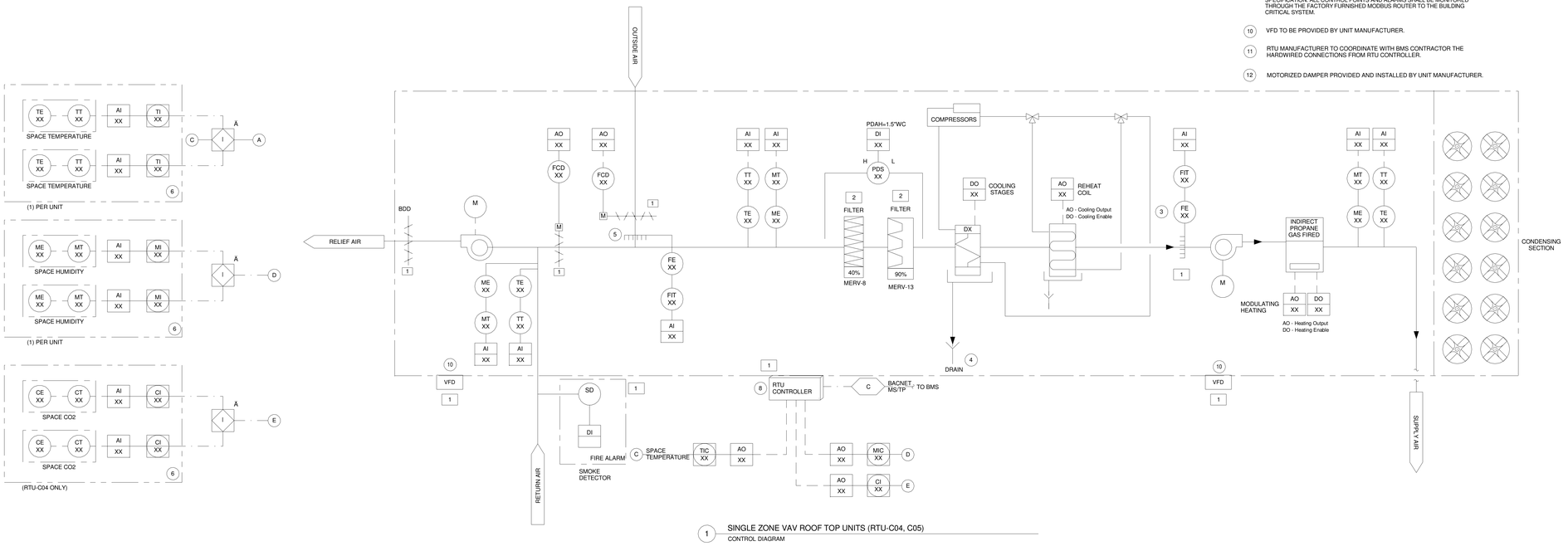


GENERAL NOTES

1. REFER TO DWG M-801 FOR INSTRUMENTATION SYMBOLS AND LEGEND.
2. FOLLOWING SYMBOLS INDICATES POINT OF RESPONSIBILITY:
   - 1 PROVIDED AND INSTALLED BY UNIT MANUFACTURER.
   - 2 PROVIDED BY UNIT MANUFACTURER, INSTALLED BY CONTRACTOR.
   - 3 BY LSS/FIRE ALARM CONTRACTOR.
   - 4 PROVIDED AND INSTALLED BY ATC CONTRACTOR.
3. FOR SCHEDULES SEE DRAWING SERIES M-600

KEYED NOTES

1. FOR COIL CONNECTION & DETAILS SEE DRAWING SERIES M-500.
2. ALL CONTROL POINTS, DEVICES, ETC. SHOWN INSIDE THE UNIT BOUNDARY SHALL BE PROVIDED BY UNIT MANUFACTURER.
3. FAN INLET AIR FLOW MONITORING SENSOR TO BE PROVIDED BY UNIT MANUFACTURER.
4. PIPE CONDENSATE TO DRAIN, FULL SIZE BASE ON UNIT MANUFACTURER.
5. AIR FLOW MONITORING STATION FURNISHED AND INSTALLED BY UNIT MANUFACTURER.
6. SPACE TEMPERATURE/ HUMIDITY/CO2/BLD. PRESSURE SENSORS PROVIDED BY ATC CONTRACTOR.
7. TIE IN INDOOR SENSOR TO SAME OUTDOOR SENSOR SHOWN ON SHEET M-802
8. ROOF TOP UNITS (RTU) ARE FURNISHED WITH A COMPLETE SELF CONTAINED DDC SYSTEM. RTU MANUFACTURER TO FURNISH BACNET INTEGRATOR TO TIE INTO THE BUILDING CRITICAL CONTROL SYSTEM FOR MONITORING AND CONTROL.
9. THE COMPRESSOR CONTROLS ARE PART OF A PACKAGED SYSTEM BY THE MANUFACTURER AND ARE NOT INDICATED ON THIS CONTROL DIAGRAM. THE PACKAGED SYSTEM SHALL SEQUENCE THE COMPRESSORS AS REQUIRED TO MAINTAIN SET-POINT. THE ASSOCIATED CONTROLS ARE INDICATED WITHIN THE SPECIFICATION. ALL CONTROL POINTS AND ALARMS SHALL BE MONITORED THROUGH THE FACTORY FURNISHED MODBUS ROUTER TO THE BUILDING CRITICAL SYSTEM.
10. VFD TO BE PROVIDED BY UNIT MANUFACTURER.
11. RTU MANUFACTURER TO COORDINATE WITH BMS CONTRACTOR THE HARDWIRED CONNECTIONS FROM RTU CONTROLLER.
12. MOTORIZED DAMPER PROVIDED AND INSTALLED BY UNIT MANUFACTURER.



1 SINGLE ZONE VAV ROOF TOP UNITS (RTU-C04, C05)
CONTROL DIAGRAM

SEQUENCE OF OPERATION:

A. GENERAL:

1. PACKAGED ROOFTOP VARIABLE AIR VOLUME (VAV) AIR HANDLING UNITS (RTUs) SHALL CONSIST OF:
   a. UNIT-MOUNTED DIGITAL CONTROLLER.
   b. SUPPLY AIR FAN WITH VARIABLE SPEED MOTOR DRIVE (VFD) .
   c. POWER EXHAUST FAN WITH VARIABLE SPEED MOTOR DRIVE (VFD)
   d. COOLING COILS OF DX COOLING CONTROL BY UNIT CONTROLLER.
   e. PROPANE GAS FIRED HEATING.
   f. OUTSIDE AIR DAMPER.
   g. MIXING AIR DAMPER.
   h. EXHAUST AIR DAMPER
2. RTU SHALL RUN AS SCHEDULED. ALARM SHALL BE GENERATED IF UNIT IS NOT RUNNING WHEN COMMANDED ON.

B. BUILDING MANAGEMENT SYSTEM (BMS) INTERFACE:

4. THE RTU CONTROLLER SHALL COMMUNICATE VIRTUAL POINTS TO THE BMS. THE SELECTED VIRTUAL POINTS SHALL BE MAPPED TO THE BMS AND SHALL BE READABLE AND/OR WRITABLE THROUGH THE RTU-TO-BMS SERIAL BACNET MS/TP COMMUNICATIONS LINK.
   a. THE BMS SHALL MONITOR DISCHARGE TEMPERATURE AND SETPOINT FROM RTU INTERNAL CONTROLLER'S THROUGH THE BACNET SERIAL LINK.
   b. IF COMMUNICATION IS LOST WITH THE BMS , THE UNIT CONTROLLER SHALL OPERATE USING ITS LAST COMMUNICATED SETPOINTS, RUN COMMAND, AND AN ALARM SHALL BE GENERATED.

C. STARTUP:

1. BMS SHALL START AND STOP THE UNIT.
2. BMS SHALL RUN THE RTU CONTINUOUSLY.
3. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE SUPPLY FAN. THE SUPPLY FAN PROVING SWITCH MUST BE CLOSED WITHIN 40 SECONDS FOR THE FAN TO CONTINUE OPERATION AFTER STARTUP. IF THE SWITCH DOES NOT CLOSE, A FAULT SHALL BE RECORDED AND TRANSMITTED TO THE BAS AND THE UNIT WILL HARD LOCKOUT ON FAN FAULT.

D. SMOKE DETECTION:

1. THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM AT THE BMS UPON RECEIVING A SMOKE DETECTOR STATUS.

E. NORMAL MODE:

1. THE RTU CONTROLLER SHALL PERFORM THE FOLLOWING FUNCTIONS:
   a. ENABLE THE SUPPLY FAN IN RESPONSE TO A BMS HARDWIRED START SIGNAL.
   b. DISABLE THE SUPPLY FAN IN RESPONSE TO A BMS STOP SIGNAL.
   c. MODULATE THE OUTDOOR AIR DAMPER OPENING AS REQUIRED TO MAINTAIN THE oa AIRFLOW BASED ON CO2.
   d. CONTROL THE STAGING OF COMPRESSORS TO MAINTAIN COOLING SUPPLY AIR TEMPERATURE (SAT) SETPOINT.
   e. CONTROL THE STAGING OF GAS HEAT TO MAINTAIN HEATING SUPPLY AIR TEMPERATURE (SAT) SETPOINT.
   f. CONTROL THE MODULATION OF OUTDOOR AIR AND RETURN AIR DAMPERS FOR ENTHALPY BASED ECONOMIZER MODE TO MAINTAIN SAT SETPOINT.
2. THE RTU CONTROLLER SHALL USE A SPACE TEMPERATURE/HUMIDITY INPUT TO RESET THE DISCHARGE TEMPERATURE.

F. SUPPLY FAN OPERATION:

1. THE CONTROLLER SHALL ENABLE THE SUPPLY FAN TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

G. RTU TEMPERATURE CONTROL:

1. RTUs SHALL ONLY HAVE COOLING AND HEATING TEMPERATURE CONTROL MODE OF OPERATION.
2. THE RTU INTERNAL TEMPERATURE CONTROLLER SHALL ENABLE COOLING OR HEATING AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT.
3. BMS SHALL MONITOR THE SPACE TEMPERATURE/HUMIDITY THRU THE BACNET LINK AND SHALL DISPLAY THE SPACE TEMPERATURE AT THE BMS HMI.
4. THE RTU SAT SETPOINT SHALL BE A WRITABLE VALUE TO THE RTU CONTROLLER FROM THE BMS HMI VIA BACNET.
5. THE RTU CONTROLLER SHALL INITIATE THE HEATING MODE. THE SIGNAL SHALL BE THE SPACE TEMPERATURE. WHENEVER THE RTU IS RUNNING AND THE SPACE TEMPERATURE DROPS BELOW 68 DEG F (ADJ.) FOR 5 MINUTES (ADJ.) THE BMS SHALL COMMAND THE RTU CONTROLLER SHALL ENABLE THE GAS HEATING STAGES AS REQUIRED TO MAINTAIN SPACE HEATING SETPOINT. THE HEATING SHALL BE DISABLED BY THE RTU CONTROLLER WHEN THE AVERAGE SPACE TEMPERATURE RISES ABOVE 70 DEG F (ADJUSTABLE).
6. THE CONTROLLER SHALL MONITOR SPACE TEMPERATURE AND SPACE HUMIDITY WITH NIST CERTIFIED SENSORS. ALL OF THE SPACE TEMPERATURE SENSORS SHALL BE AVERAGED, AND ALL THE COOLING STAGES, AND GAS HEATING STAGES SHALL BE TURNED ON AND OFF TOGETHER FOR ALL THREE RTU'S. ECONOMIZER POSITIONS, SETPOINTS AND STAGING SHALL ALSO BE OPERATED TOGETHER. THE SPACE AIR MIXING SOLUTION WILL KEEP THE ENTIRE SPACE AT NEARLY UNIFORM TEMPERATURE.

A 75°F (ADJ.) COOLING SETPOINT
A 70°F (ADJ.) HEATING SETPOINT

7. ZONE SETPOINT ADJUST: ZONE TEMPERATURE SETPOINTS SHALL BE ADJUSTABLE AT THE BMS WORKSTATION ONLY, WITH NO OCCUPANT ADJUSTMENT AT THE ZONE SENSOR.

H. VOLUME CONTROL

1. THE SUPPLY FANS ARE PROVIDED WITH VFD TO PROVIDE A METHOD OF REDUCING ENERGY. THE SUPPLY FANS PROVIDE MAXIMUM OCCUPIED FLOW RATE AS SHOWN ON PLANS.
2. THE FAN SHALL RUN IN VARIABLE VOLUME FLOW AS SCHEDULED. THE MINIMUM AIRFLOW SHALL EXCEED THE MINIMUM REQUIRED OUTSIDE AIRFLOW.
3. ONCE THE SPACE TEMPERATURE SETPOINT IS MET AND CONFIRMED, THE BMS SHALL MODULATE AIR FLOW THROUGH SUPPLY VFD TO MAINTAIN SPACE SETPOINT. DURING THIS TIME BMS SHALL MAINTAIN THE SAME DISCHARGE TEMPERATURE.

I. COOLING MODE

1. THE CONTROLLER SHALL MEASURE THE AVERAGE ZONE TEMPERATURE AND STAGE THE COOLING TO MAINTAIN COOLING SETPOINT. TO PREVENT SHORT CYCLING, THERE SHALL BE A USER DEFINABLE (ADJ.) DELAY BETWEEN STAGES, AND EACH STAGE SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME. THE COOLING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS GREATER THAN 45°F (ADJ.).
- AND THE ECONOMIZER IS NOT ABLE TO MAINTAIN SPACE SETPOINT. ECONOMIZER AND DX COOLING SHALL BE ALLOWED TO OPERATE SIMULTANEOUSLY. SEE ECONOMIZER SECTION FOR ENTHALPY BASED CONTROL.
- AND THE ZONE TEMPERATURE IS ABOVE COOLING SETPOINT.
- AND THE SUPPLY FAN STATUS IS ON.
- AND THE HEATING IS NOT ACTIVE.

J. GAS HEATING MODE:

1. THE CONTROLLER SHALL MEASURE THE AVERAGE ZONE TEMPERATURE AND STAGE THE HEATING TO MAINTAIN HEATING SETPOINT.
   - THE HEATING SHALL BE ENABLED WHENEVER:
   - OUTSIDE AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).
   - AND THE ECONOMIZER IS AT MINIMUM POSITION.
   - AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.
   - AND THE SUPPLY FAN STATUS IS ON.
   - AND THE COOLING IS NOT ACTIVE.

K. ECONOMIZER MODE:

1. THE BMS SHALL MONITOR TEMPERATURE, RELATIVE HUMIDITY AND CALCULATED ENTHALPY FOR OA THROUGH THE BACNET LINK.
2. THE ECONOMIZER SHALL BE CONTROLLED BY THE CONTROLLER. THE CONTROLLER SHALL MODULATE THE ECONOMIZER DAMPERS IN SEQUENCE TO MAINTAIN A DISCHARGE AIR TEMPERATURE SETPOINT BASED ON THE AVERAGE ZONE TEMPERATURE. DISCHARGE AIR TEMPERATURE SETPOINT SHALL VARY FROM 45°F TO 60°F AS AVERAGE ZONE TEMPERATURE DIFFERENCE FROM SETPOINT GOES FROM +5°F TO +0°F. THE OUTSIDE AIR DAMPERS SHALL MAINTAIN A MINIMUM ADJUSTABLE POSITION OF 20% (ADJ.) OPEN WHENEVER UNIT IS RUNNING.
3. THE ECONOMIZER SHALL BE ENABLED WHENEVER:
   - THE INDOOR ENTHALPY (AVERAGE) IS GREATER THAN THE OUTDOOR ENTHALPY WITH A 1 BTU/LB DEADBAND.
   - AND THE OUTDOOR TEMPERATURE IS ABOVE 38°F WITH A 1°F DEADBAND.
   - AND THE SUPPLY FAN IS RUNNING.
6. THE ECONOMIZER SHALL CLOSE WHENEVER:
   - MIXED AIR TEMPERATURE DROPS FROM 45°F TO 40°F (ADJ.).
   - OR ON LOSS OF SUPPLY FAN STATUS.
7. THE OUTSIDE AIR DAMPERS SHALL CLOSE AND THE RETURN AIR DAMPER SHALL OPEN WHEN THE UNIT IS OFF.
8. SPACE TEMPERATURE AND HUMIDITY: THE CONTROLLER SHALL MONITOR THE SPACE TEMPERATURE AND HUMIDITY AND USE AS REQUIRED FOR ECONOMIZER CONTROL.

L. DEHUMIDIFICATION MODE:

1. WHEN THE UNIT IS IN COOLING MODE AND THE SPACE TEMPERATURE SETPOINT IS SATISFIED, WHEN THE SPACE HUMIDITY IS GREATER THAN THE SETPOINT (60% RH (ADJ.) DEHUMIDIFICATION MODE SHALL BE ACTIVATED.
2. THE SUPPLY FAN VFD SHALL INCREASE THE FAN SPEED TO MAINTAIN MAX AIRFLOW.
3. THE UNIT SHALL STAGE ITS COOLING TO MAINTAIN A COOLING COIL LAT OF 55°F AND ACTIVATE THE REHEAT COIL TO SUPPLY AIR TO THE SPACE AT A TEMPERATURE OF 72°F (ADJ.).
4. ONCE THE SPACE HUMIDITY IS LESS THAN THE SETPOINT THE UNIT SHALL OPERATE IN ITS NORMAL MODE.

M. FILTER STATUS:

1. A DIFFERENTIAL PRESSURE INDICATING SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER(S). IF THE SWITCH CLOSES WHEN THE FAN IS RUNNING FOR 1 MINUTE OR AFTER FAN START, A DIRTY FILTER ALARM SHALL BE ANNUNCIATED AT THE BMS HMI.

N. LOSS OF POWER:

1. THE BMS WILL SEND A RE-START COMMAND SIGNAL TO THE RTU CONTROLLER AFTER RECOVERY FROM A POWER FAILURE.

O. SHUTDOWN CONTROL:

1. RTUS SHALL SHUT DOWN BY THE FOLLOWING SIGNALS:
   a. SAFETY CIRCUIT SHUT DOWN (SD) TERMINAL.
   b. FAILED SUPPLY AIR (SA) TEMPERATURE SENSOR.
   c. FAILED RETURN AIR (RA) TEMPERATURE SENSOR.
   d. FAN PROOF.
2. RTUS SHALL ALSO BE MANUALLY SHUTDOWN BY OPERATOR THROUGH BMS HMI.
3. WHEN THE RTU IS STOPPED BY THE BMS BY OPENING THE START (OCCUPIED) CONTACT SIGNAL, THE UNIT'S CONTROLLER WILL PLACE THE RTU IN UNOCCUPIED MODE. TO PREVENT THE RTU FROM STARTING UNDER UNOCCUPIED MODE THE RTU CONTROLLER SETTINGS FOR SETBACK OPERATION SHALL BE DISABLED.
4. THE UNIT'S CONTROLLER SHALL COMMAND THE SUPPLY FAN TO SHUT DOWN INTO UNOCCUPIED MODE AND THE RETURN FAN SHALL ALSO SHUT DOWN AS IT SHALL BE INTERLOCKED TO ALLOW OPERATION ONLY WHEN THE SUPPLY FAN IS RUNNING.
5. A SAFETY SHUTDOWN BY SMOKE DETECTOR WILL REQUIRE THE RTU TO BE MANUALLY STARTED FROM THE BMS HMI AFTER THE SAFETY SHUTDOWN HAS BEEN CLEARED.

P. MINIMUM OUTSIDE AIR VENTILATION - CARBON DIOXIDE (CO2) CONTROL (RTU-C04 ONLY):

1. WHEN IN THE OCCUPIED MODE, THE BMS SHALL MEASURE THE AVERAGE SPACE CO2 LEVELS AND MODULATE THE OUTSIDE AIR DAMPERS OPEN ON RISING CO2 CONCENTRATIONS, OVERRIDING NORMAL DAMPER OPERATION TO MAINTAIN A CO2 SETPOINT OF 750 PPM (ADJ.).

Q. FAN STATUS:

1. THE SUPPLY/EXHAUST FAN RUNNING STATUS SHALL BE PROVIDED BY THE AIR PROVING SWITCH THROUGH THE BACNET LINK.

R. EXHAUST FAN CONTROL:

1. RTU CONTROL SYSTEM SHALL MODULATE THE EXHAUST FAN VFD TO MAINTAIN BUIDING PRESSURE SETPOINT. INITIALLY SET AT +0.05" (ADJ.).
2. THE BMS SHALL MEASURE BOTH BUILDING STATIC PRESSURE AND SHALL BE AVERAGED TO KEEP THE ENTIRE SPACE AT NEARLY UNIFORM TEMPERATURE.
3. THE EXHAUST FAN VFD SPEED SHALL NOT DROP BELOW 20% (adj.) AND SHALL ALSO BE OPERATED TOGETHER.

Additions and Renovations to Harrah's Cherokee Valley River

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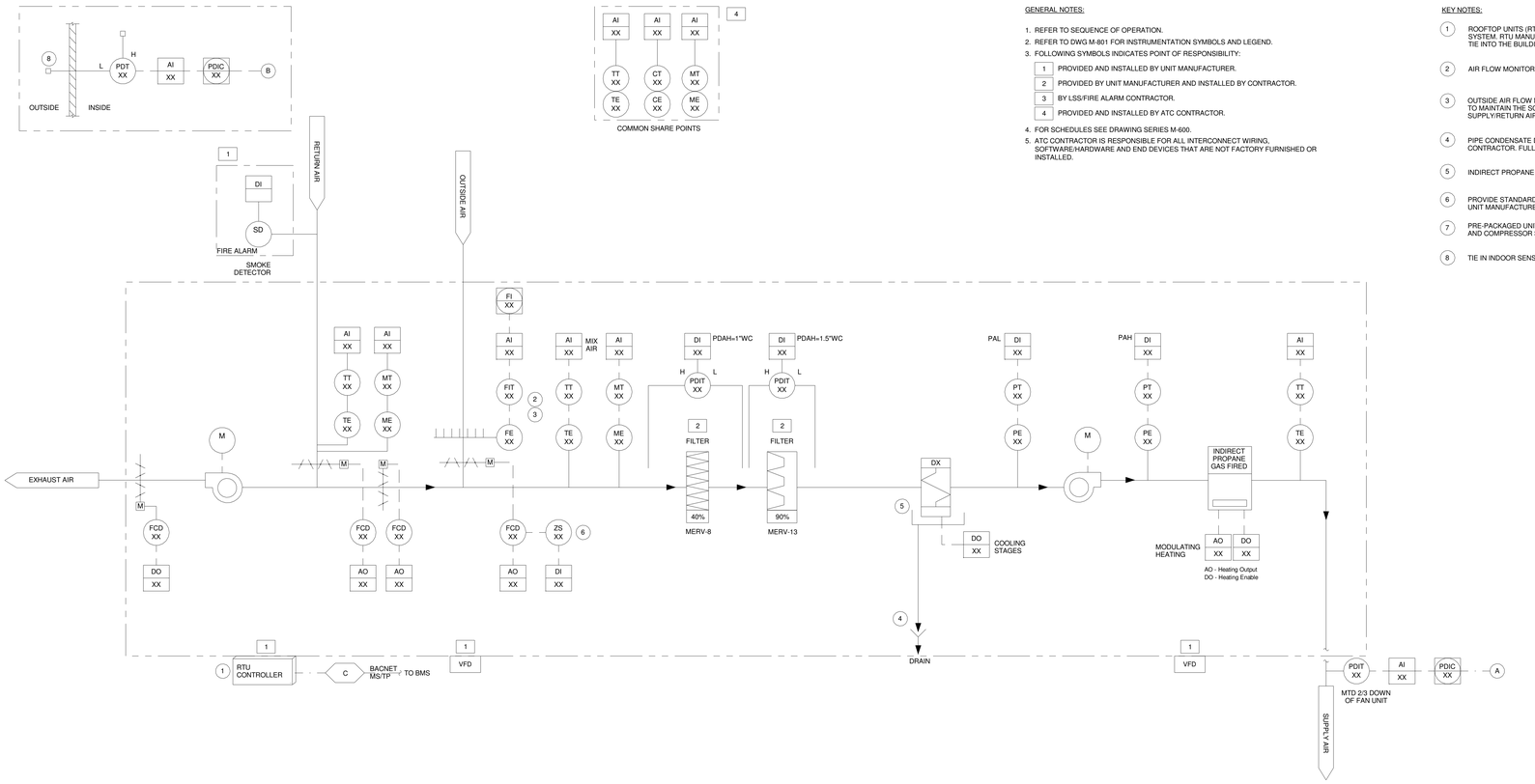
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HVAC CONTROLS

M-805

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GENERAL NOTES:

1. REFER TO SEQUENCE OF OPERATION.
2. REFER TO DWG M-801 FOR INSTRUMENTATION SYMBOLS AND LEGEND.
3. FOLLOWING SYMBOLS INDICATES POINT OF RESPONSIBILITY:
   - 1 PROVIDED AND INSTALLED BY UNIT MANUFACTURER.
   - 2 PROVIDED BY UNIT MANUFACTURER AND INSTALLED BY CONTRACTOR.
   - 3 BY LSS/FIRE ALARM CONTRACTOR.
   - 4 PROVIDED AND INSTALLED BY ATC CONTRACTOR.
4. FOR SCHEDULES SEE DRAWING SERIES M-600.
5. ATC CONTRACTOR IS RESPONSIBLE FOR ALL INTERCONNECT WIRING, SOFTWARE/HARDWARE AND END DEVICES THAT ARE NOT FACTORY FURNISHED OR INSTALLED.

KEY NOTES:

1. ROOFTOP UNITS (RTU) ARE FURNISHED WITH A COMPLETE SELF CONTAINED DDC SYSTEM. RTU MANUFACTURER TO FURNISH BACNET OR LON-WORKS INTEGRATOR TO TIE INTO THE BUILDING DDC CONTROL SYSTEM FOR MONITORING AND CONTROL.
2. AIR FLOW MONITORING STATION FURNISHED AND INSTALLED BY UNIT MANUFACTURER.
3. OUTSIDE AIR FLOW MONITORING STATION SHALL CONTROL THE OUTSIDE AIR DAMPER TO MAINTAIN THE SCHEDULED MIN. VENTILATION RATE, INDEPENDENT FROM THE SUPPLY/RETURN AIR PROPORTIONAL FLOW RATE. (BY ATC CONTRACTOR)
4. PIPE CONDENSATE DRAIN LINES TO ROOF LEVEL SPLASH GUARDS, PROVIDED BY HVAC CONTRACTOR. FULL SIZE BASED ON UNIT MANUFACTURER
5. INDIRECT PROPANE GAS FIRED HEATER.
6. PROVIDE STANDARD MOTORIZED DAMPER WITH END SWITCH PROVIDED AND INSTALLED UNIT MANUFACTURER.
7. PRE-PACKAGED UNIT- REFRIGERANT LINES ARE CONNECTED TO THE UNIT CONDENSER AND COMPRESSOR SECTIONS.
8. TIE IN INDOOR SENSOR TO SAME OUTDOOR SENSOR SHOWN ON SHEET M-802

SEQUENCE OF OPERATION:

A. GENERAL:

1. ROOFTOP AIR HANDLING UNITS SUPPLY THE REQUIRED CONDITIONED SUPPLY AIRFLOWS TO BOH SPACES WITHIN THE BUILDING. ROOFTOP UNITS DX COOLING TYPE WITH R-410A REFRIGERANT AND PROPANE GAS-FIRED HEATING.
2. RTUs ARE A RECIRCULATING TYPE UNITS SERVING THE BOH SPACES AND SHALL RUN 24/7.
3. ROOFTOP AIR HANDLING UNITS ARE PROVIDED WITH BUILT-IN MICROPROCESSOR-BASED DIGITAL CONTROLS FOR SUPPLY AIR TEMPERATURE SETPOINT CONTROL, ENERGY OPTIMIZATION, AND COOLING DEHUMIDIFICATION CONTROL.
4. THE ROOFTOP AIR HANDLING UNIT CONTROLLERS SHALL HAVE FOLLOWING CONNECTIONS TO THE BMS:
   a. BACNET MS/TP NETWORK INTERFACE FOR MONITORING UNIT OPERATION AND PERFORMANCE.
5. THE RTU CONTROLLER'S BACNET MS/TP NETWORK INTERFACE SHALL BE CONFIGURED PER OWNER/ SITE-BMS STANDARDS.
6. OUTSIDE AIR FLOW MEASURING STATIONS (FMS) SHALL BE USED TO MONITOR AND DISPLAY AIR VOLUMES AT THE CONTROL SYSTEM. THE AIRFLOWS SHALL BE USED BY THE CONTROL SYSTEM TO ENSURE MINIMUM OUTSIDE AIR FOR VENTILATION IS MAINTAINED.
7. FILTER STATUS SHALL BE MONITORED BY A DIFFERENTIAL PRESSURE INDICATOR/ TRANSMITTERS PDIT-X001 AND PDIT-X002.

B. SAFETIES:

1. THE FOLLOWING SAFETIES, EACH WITH ITS OWN MANUAL RESET BUTTON, SHALL SHUT DOWN UNIT AND THE CONTROL SYSTEM SHALL INITIATE RESPECTIVE ALARM:
   a. RETURN SMOKE DETECTOR (SD) IS ACTIVATED. SMOKE DETECTORS SHALL BE FURNISHED AND WIRED TO THE FIRE ALARM SYSTEM BY OTHERS, ATC CONTRACTOR SHALL MOUNT DETECTORS AND WIRE TO CONTROL SYSTEM.
   b. DISCHARGE STATIC PRESSURE HIGH LIMIT (SPH) INDICATES MORE THAN ALARM SETPOINT STATIC PRESSURE WHEN THE UNIT STATUS IS ON (WITH A 5 MINUTE DELAY).
   c. INTAKE STATIC PRESSURE LOW LIMIT (SPL) INDICATES LESS THAN ALARM SETPOINT NEGATIVE STATIC PRESSURE WHEN THE UNIT STATUS IS ON (WITH A 5 MINUTE DELAY).
   d. DISCHARGE AIR TEMPERATURE SENSOR (DAT) GOES BELOW THE DISCHARGE AIR LOW ALARM SETPOINT WHEN STATUS IS ON.
2. THE CONTROL SYSTEM SHALL INITIATE AN ALARM, DESCRIBING THE ALARM IF ANY OF THE FOLLOWING CONDITIONS ARE MET:
   a. SUPPLY OR EXHAUST FANS ARE COMMANDED TO RUN AND ANYTIME AFTER A 15 SECOND DELAY THE CONTROL SYSTEM SENSES NO STATUS VIA THE FANS CURRENT TRANSFORMER RELAYS (CT).
   b. FILTER DIFFERENTIAL PRESSURE SWITCH (FDPS) SENSES GREATER THAN SETPOINT STATIC PRESSURE DROP FOR 15 MINUTES.
   c. DISCHARGE AIR TEMPERATURE SENSOR (DAT) GOES ABOVE THE DISCHARGE AIR HIGH ALARM SETPOINT FOR 10 MINUTES WHEN STATUS IS ON.
   d. ALL CONTROL SYSTEM SENSORS SHALL HAVE A HIGH AND LOW SOFTWARE ALARM LIMIT TO INDICATE TEMPERATURE PROBLEMS OR A FAULTY SENSOR.
   e. WHENEVER A UNIT IS SHUT DOWN BECAUSE OF ONE OF THE SAFETIES, THE CONTROL SYSTEM SHALL RETAIN IN MEMORY THE READING AND SETPOINT OF EACH DEVICE TO HELP THE OPERATOR IN ISOLATING THE REASON FOR THE PROBLEM.
   f. OUTSIDE AIR VOLUMETRIC FLOW RATE FALLS BELOW SCHEDULED MINIMUM REQUIRED AMOUNT FOR 5 CONSECUTIVE MINUTES (AUDIBLE ALARM SHALL ALSO BE INITIATED).
   g. RTU SUPPLY AND RETURN FAN STATUS SHALL BE MONITORED BY THE BAS VIA CURRENT TRANSMITTERS.
   h. AUXILIARY ALARM CONTACTS IN THE AHU OR RF VARIABLE FREQUENCY DRIVE (VFD) INDICATES A FAILURE OF THE VFD - DELAY 15 SECONDS.
C. RTU TEMPERATURE CONTROL:
1. THE RTU INTERNAL TEMPERATURE CONTROLLER SHALL ENABLE COOLING OR HEATING AS REQUIRED TO MAINTAIN A SUPPLY AIR TEMPERATURE SETPOINT (55 DEGREES F).
2. THE BMS SHALL MONITOR RTU SUPPLY AIR TEMPERATURE AND SHALL GENERATE AN ALARM AT THE HMI WHENEVER THE RTU SUPPLY AIR TEMPERATURE INCREASES ABOVE OR DECREASES BELOW THE DESIGN OPERATING RANGE (MAX: 60° F AND MIN: 50° F).
3. THE BAS SHALL CALCULATE A NEW DISCHARGE SET POINT EVERY THIRTY MINUTES (ADJ.) BASED ON THE NUMBER OF COOLING/HEATING REQUESTS. A COOLING REQUEST IS DEFINED AS ANY TERMINAL BOX THAT IS REPORTING ABOVE ZONE SET POINT AT MAXIMUM AIR FLOW. A HEATING REQUEST IS DEFINED AS ANY TERMINAL BOX THAT IS REPORTING BELOW ZONE SET POINT AT HEATING AIR FLOW. THE CALCULATION SHALL BE: NEW SET POINT=55(ADJ.)+0.25(ADJ.)+((-0.25)(# CLG RQSTS)(ADJ.)) + ((0.25)(# HTG RQSTS)(ADJ.)). THE RESPOND VALUE IN PARENTHESIS SHALL BE LIMITED TO 1°F (ADJ.) PER THIRTY MINUTE (ADJ.) ITERATION. WHEN THE UNIT INITIATES ECONOMIZER MODE DISABLE THE DISCHARGE TEMPERATURE RESET AND CONTROL TO 55 DEG F (ADJ.).

D. STATIC PRESSURE AND VOLUMETRIC CONTROL:

1. SUPPLY FAN VFD SHALL BE MODULATED TO MAINTAIN STATIC PRESSURE SETPOINT AT THE STATIC PRESSURE SENSOR LOCATED 2/3 OF THE WAY DOWN THE SUPPLY DUCTWORK. AS SYSTEM REQUIREMENTS FOR AIR VOLUME INCREASE AND SYSTEM STATIC PRESSURE AT CONTROLLING SP DROPS BELOW SETPOINT, THE VFD'S SHALL SPEED UP. AS SYSTEM REQUIREMENTS FOR AIR VOLUME DECREASE AS SENSED BY AN INCREASE IN STATIC PRESSURE ABOVE SETPOINT AT THE STATIC PRESSURE SENSOR, THE VFD'S SHALL SLOW DOWN. PROVIDE ADEQUATE DIFFERENTIAL AROUND SETPOINT TO PREVENT EXCESSIVELY RAPID CHANGES IN AIR VOLUME.
2. INITIAL STATIC PRESSURE SETPOINT UPON AHU STARTUP SHALL BE DETERMINED BY CONTROLS CONTRACTOR. STATIC SETPOINT SHALL BE RESET EVERY 5 MINUTES BASED ON TERMINAL BOX DAMPER POSITION AS FOLLOWS.
3. THE BMS SHALL POLL ALL OF THE SUPPLY TERMINAL BOX DAMPER POSITIONS:
   a. IF ANY DAMPER POSITION IS GREATER THAN 90% OPEN, STATIC PRESSURE SETPOINT SHALL BE INCREASED BY 0.05" W.G.
   b. IF NO DAMPER POSITION IS GREATER THAN 70% OPEN STATIC PRESSURE SETPOINT SHALL BE DECREASED BY 0.05" W.G.
   c. UPON SHUT DOWN OF AHU, STATIC PRESSURE SETPOINT SHALL BE RESET TO INITIAL SETPOINT.
4. RTU CONTROL SYSTEM SHALL MODULATE THE EXHAUST FAN VFD TO MAINTAIN BUIDING PRESSURE SETPOINT. INITIALLY SET AT +0.05" (ADJ.).

E. SHUTDOWN CONTROL:

1. IF AN RTU FAILS TO RUN OR SHUTS DOWN, THE FSA-BMS SHALL DE-ENERGIZE THE CONTROL OUTPUT TO THE FAILED RTU AND GENERATE A CRITICAL ALARM AT THE HMI.
2. RTU DISCHARGE TEMPERATURE ALARMING OF RTU'S NOT RUNNING SHALL BE DISABLED.

F. ECONOMIZER OPERATION:

a. IF THE OUTDOOR AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY, THE SYSTEM SHALL INITIATE AN ECONOMIZER MODE. THE AMOUNT OF COOLING REQUIRED SHALL BE DETERMINED BY THE DISCHARGE AIR TEMPERATURE SENSOR. THE OUTDOOR AIR DAMPERS SHALL MODULATE FROM THEIR MINIMUM POSITIONS TO 100% OPEN AND THE RETURN AIR DAMPER SHALL CLOSE PROPORTIONATELY AS REQUIRED TO MAINTAIN DISCHARGE AIR TEMPERATURE (DAT). IF, AFTER A 60 SECOND ADJUSTABLE DELAY, THE ECONOMIZER IS AT MAXIMUM ALLOWABLE POSITION AND DISCHARGE TEMPERATURE IS 2 F DEGREES ABOVE SETPOINT, THE MECHANICAL COOLING SHALL BE STAGED ON AS REQUIRED TO SATISFY DAT. IF THE DISCHARGE AIR TEMPERATURE FALLS BELOW ITS SETPOINT, THE SEQUENCE SHALL BE REVERSED.

b. IF THE OUTDOOR AIR ENTHALPY IS GREATER THAN THE RETURN AIR ENTHALPY, THE SYSTEM SHALL NOT INITIATE ECONOMIZER MODE. THE OUTDOOR AIR AIR DAMPER SHALL BE INDEXED TO THEIR MINIMUM POSITION. THE AMOUNT OF COOLING REQUIRED SHALL BE DETERMINED BY THE SPACE AIR TEMPERATURE SENSOR.

G. EXHAUST FAN CONTROL:

1. RTU CONTROL SYSTEM SHALL MODULATE THE EXHAUST FAN VFD TO MAINTAIN BUIDING PRESSURE SETPOINT. INITIALLY SET AT +0.05" (ADJ.).
2. THE BMS SHALL MEASURE BOTH BUILDING STATIC PRESSURE AND SHALL BE AVERAGED TO KEEP THE ENTIRE SPACE AT NEARLY UNIFORM TEMPERATURE.
3. THE EXHAUST FAN VFD SPEED SHALL NOT DROP BELOW 20% (adj.) AND SHALL ALSO BE OPERATED TOGETHER.

H. MINIMUM OUTSIDE AIR VENTILATION:

1. THE OUTSIDE AIR DAMPERS SHALL MAINTAIN A MINIMUM POSITION (ADJ.) DURING BUILDING OCCUPIED HOURS AND BE CLOSED DURING UNOCCUPIED HOURS. UNITS WITH ZONES CONTROLLED BY A LOCAL CO2 SENSOR (RTU-C03 ONLY)THE OAD SHALL MODULATE TO MAINTAIN THE MINIMUM OUTSIDE AIR CFM. CO2 SENSING SHALL ALLOW THE DAMPER TO REDUCE FURTHER MAINTAINING CO2 LEVEL 400 PPM ABOVE AMBIENT BUT NOT MORE THEN 1000 PPM. (THIS OCCURS ONLY DURINGNON-ECONOMIZER MODE).

1 PHASE 2 (AREA N) - MULTI-ZONE VAV ROOFTOP UNIT RTU-M01 (BOH AREA)
CONTROL DIAGRAM

Additions and Renovations to Harrah's Cherokee Valley River

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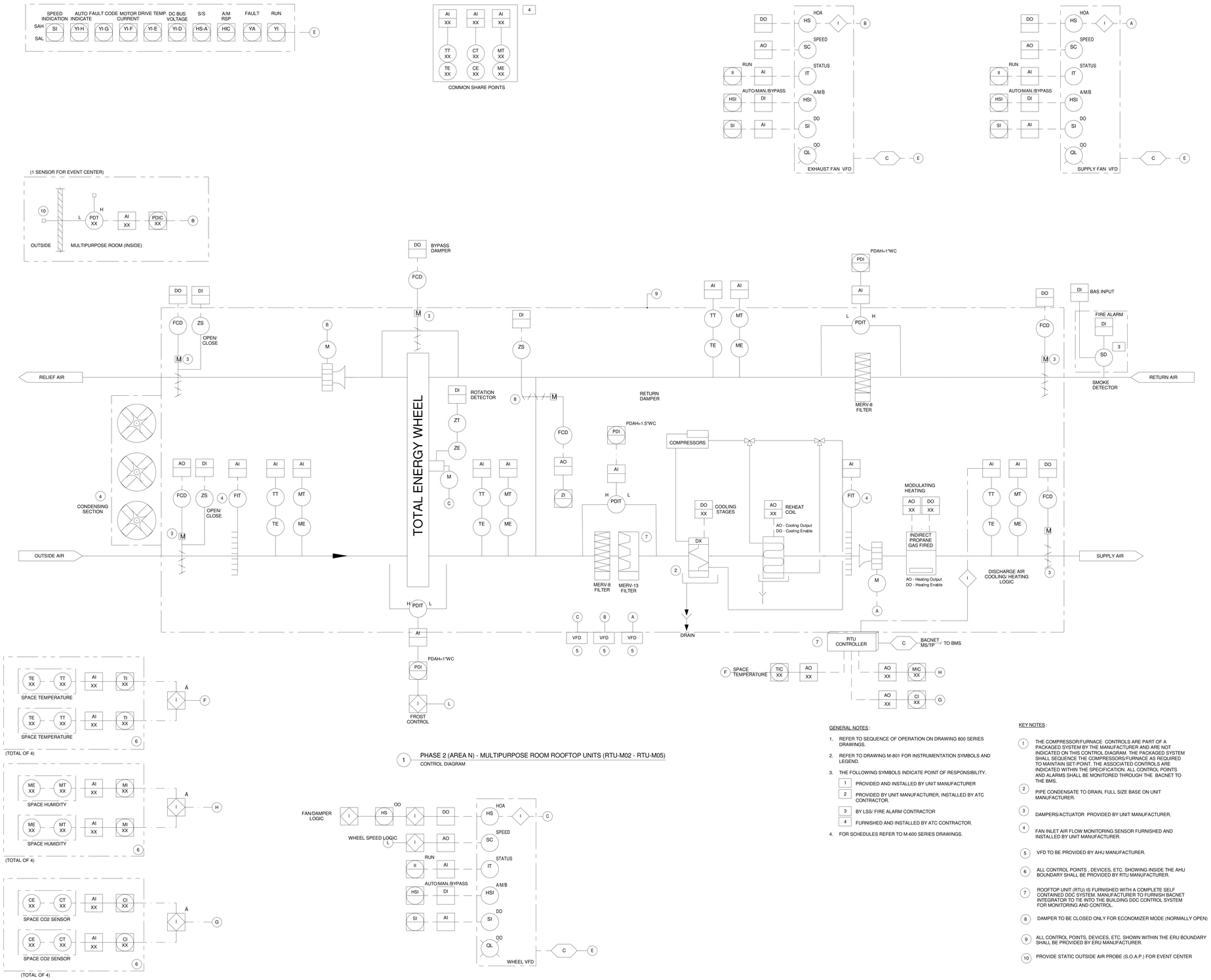
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HVAC CONTROLS

M-806

1/30/2023 11:21:52 AM DRAWING PRINTED FULL SIZE (ISO A1) - DO NOT SCALE DRAWING PRINTED HALF SIZE (ISO A3) - ALL FIT ON A SHEET. IF NOT WITH 1.5" EXTRA SPACE ON ALL FOUR SIDES | DRAWING PRINTED HALF SIZE (ISO A3) - ALL FIT ON A SHEET. IF NOT WITH 1" EXTRA SPACE ON ALL FOUR SIDES | DRAWING PRINTED AS ANSI C SHEET. IF NOT WITH 1.5" EXTRA SPACE ON ALL FOUR SIDES | DRAWING PRINTED AS ANSI D SHEET. IF NOT WITH 1" EXTRA SPACE ON ALL FOUR SIDES | DRAWING PRINTED AS ANSI E SHEET. IF NOT WITH 1" EXTRA SPACE ON ALL FOUR SIDES | DRAWING PRINTED AS ARCH D SHEET (24"X36") - 1:1 SCALE IF FULL SIZE | DRAWING SIZE: 22"X36" - 1:1 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E1 SHEET (30"X42") - 1:1 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E SHEET (36"X48") - 1:1 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E2 SHEET (26"X38") - 1:1 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E3 SHEET (27"X39") - 1:1 SCALE IF FULL SIZE | DRAWING SIZE: 24"X36" - 1:1 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH D1 SHEET (25"X37") - 1:1 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH D2 SHEET (26"X38") - 1:1 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH D3 SHEET (27"X39") - 1:1 SCALE IF FULL SIZE | DRAWING SIZE: 30"X42" - 1:1 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E1 SHEET (30"X42") - 1:1 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E SHEET (36"X48") - 1:1 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E2 SHEET (26"X38") - 1:1 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E3 SHEET (27"X39") - 1:1 SCALE IF FULL SIZE | DRAWING SIZE: 36"X48" - 1:1 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E SHEET (36"X48") - 1:1 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E2 SHEET (26"X38") - 1:1 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E3 SHEET (27"X39") - 1:1 SCALE IF FULL SIZE | DRAWING SIZE: 48"X96" - 1:2 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E3 SHEET (27"X39") - 1:2 SCALE IF FULL SIZE | DRAWING SIZE: 48"X120" - 1:2.5 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E3 SHEET (27"X39") - 1:2.5 SCALE IF FULL SIZE | DRAWING SIZE: 48"X144" - 1:3 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E3 SHEET (27"X39") - 1:3 SCALE IF FULL SIZE | DRAWING SIZE: 48"X192" - 1:4 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E3 SHEET (27"X39") - 1:4 SCALE IF FULL SIZE | DRAWING SIZE: 48"X240" - 1:5 SCALE IF FULL SIZE | DRAWING PRINTED AS ARCH E3 SHEET (27"X39") - 1:5 SCALE IF FULL SIZE | DRAWING SIZE:

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1 PHASE 2 (AREA N) - MULTIPURPOSE ROOM ROOFTOP UNITS (RTU-M02 - RTU-M05)
CONTROL DIAGRAM

GENERAL NOTES:

1. REFER TO SEQUENCE OF OPERATION ON DRAWING 800 SERIES DRAWINGS.
2. REFER TO DRAWING M-801 FOR INSTRUMENTATION SYMBOLS AND LEGEND.
3. THE FOLLOWING SYMBOLS INDICATE POINT OF RESPONSIBILITY.
   - 1 PROVIDED AND INSTALLED BY UNIT MANUFACTURER
   - 2 PROVIDED BY UNIT MANUFACTURER, INSTALLED BY ATC CONTRACTOR.
   - 3 BY LSS/ FIRE ALARM CONTRACTOR
   - 4 FURNISHED AND INSTALLED BY ATC CONTRACTOR.
4. FOR SCHEDULES REFER TO M-600 SERIES DRAWINGS.

KEY NOTES:

1. THE COMPRESSOR/FURNACE CONTROLS ARE PART OF A PACKAGED SYSTEM BY THE MANUFACTURER AND ARE NOT INDICATED ON THIS CONTROL DIAGRAM. THE PACKAGED SYSTEM SHALL SEQUENCE THE COMPRESSORS/FURNACE AS REQUIRED TO MAINTAIN SET-POINT. THE ASSOCIATED CONTROLS ARE INDICATED WITHIN THE SPECIFICATION. ALL CONTROL POINTS AND ALARMS SHALL BE MONITORED THROUGH THE BACNET TO THE BMS.
2. PIPE CONDENSATE TO DRAIN, FULL SIZE BASE ON UNIT MANUFACTURER.
3. DAMPERS/ACTUATOR PROVIDED BY UNIT MANUFACTURER,
4. FAN INLET AIR FLOW MONITORING SENSOR FURNISHED AND INSTALLED BY UNIT MANUFACTURER.
5. VFD TO BE PROVIDED BY AHU MANUFACTURER.
6. ALL CONTROL POINTS , DEVICES, ETC. SHOWING INSIDE THE AHU BOUNDARY SHALL BE PROVIDED BY RTU MANUFACTURER.
7. ROOFTOP UNIT (RTU) IS FURNISHED WITH A COMPLETE SELF CONTAINED DDC SYSTEM. MANUFACTURER TO FURNISH BACNET INTEGRATOR TO TIE INTO THE BUILDING DDC CONTROL SYSTEM FOR MONITORING AND CONTROL.
8. DAMPER TO BE CLOSED ONLY FOR ECONOMIZER MODE (NORMALLY OPEN)
9. ALL CONTROL POINTS, DEVICES, ETC. SHOWN WITHIN THE ERU BOUNDARY SHALL BE PROVIDED BY ERU MANUFACTURER.
10. PROVIDE STATIC OUTSIDE AIR PROBE (S.O.A.P.) FOR EVENT CENTER

Additions and Renovations to Harrah's Cherokee Valley River

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Murphy, NC 28906

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1/30/2023

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DRAWN	MWM
SCALE	NTS
REVISIONS	

HVAC CONTROLS

M-807

1/30/2023 11:21:55 AM DRAWING PRINTED FULL SIZE (30"H) - IF NOT DRAWING PRINTED AT 42" X 30" SHEET, SCALE WILL BE 3/4" = 1'-0" FOR SCALES AT 24" X 36" SHEET THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. EXAMPLE 3/4" = 1'-0" AT 22"X 34" IS 1/2" = 1'-0" AND 3/32"

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SEQUENCE OF OPERATION

A. GENERAL:

1. PACKAGED ENERGRY RECOVERY ROOFTOP AIR HANDLING UNITS (RTUs) SHALL CONSIST OF:
   a. UNIT-MOUNTED DIGITAL CONTROLLER.
   b. SUPPLY AIR FAN WITH VARIABLE SPEED MOTOR DRIVE (VFD) .
   c. EXHAUST FAN WITH VARIABLE SPEED MOTOR DRIVE (VFD)
   d. COOLING COILS OF DX COOLING CONTROL BY UNIT CONTROLLER.
   e. PROPANE GAS FIRED HEATING COILS. CONTROL BY UNIT CONTROLLER.
   f. ENERGY RECOVERY ENTHALPY WHEEL WITH VARIABLE SPEED MOTOR DRIVE (VFD)
   g. OUTSIDE AIR DAMPER.
   h. ECONOMIZER CONTROLS.
   i. EXHAUST AIR DAMPER.
   j. BYPASS DAMPER
   k. RETURN DAMPER

B. BUILDING MANAGEMENT SYSTEM (BMS) INTERFACE:

1. THE RTU CONTROLLER SHALL COMMUNICATE VIRTUAL POINTS TO THE BMS. THE SELECTED VIRTUAL POINTS SHALL BE MAPPED TO THE BMS AND SHALL BE READABLE AND/OR WRITABLE THROUGH THE RTU-TO-BMS SERIAL BACNET MS/TP COMMUNICATIONS LINK.

   a. THE BMS SHALL MONITOR DISCHARGE TEMPERATURE AND SETPOINT FROM ERU INTERNAL CONTROLLER'S THROUGH THE BACNET SERIAL LINK.

   b. IF COMMUNICATION IS LOST WITH THE BMS , THE UNIT CONTROLLER SHALL OPERATE USING ITS LAST COMMUNICATED SETPOINTS, RUN COMMAND, AND AN ALARM SHALL BE GENERATED.

C. STARTUP:

1. BMS SHALL START AND STOP THE UNIT.

2. BMS SHALL RUN THE RTU CONTINUOUSLY.

3. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE SUPPLY FAN. THE SUPPLY FAN PROVING SWITCH MUST BE CLOSED WITHIN 40 SECONDS FOR THE FAN TO CONTINUE OPERATION AFTER STARTUP. IF THE SWITCH DOES NOT CLOSE, A FAULT SHALL BE RECORDED AND TRANSMITTED TO THE BAS AND THE UNIT WILL HARD LOCKOUT ON FAN FAULT.

D. SMOKE DETECTION:

1. THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM AT THE BMS UPON RECEIVING A SMOKE DETECTOR STATUS.

E. NORMAL MODE:

1. THE RTU CONTROLLER SHALL PERFORM THE FOLLOWING FUNCTIONS:
   a. ENABLE THE SUPPLY FAN IN RESPONSE TO A BMS HARDWIRED START SIGNAL.
   b. DISABLE THE SUPPLY FAN IN RESPONSE TO A BMS STOP SIGNAL.
   c. WHEEL FROST CONTROL, MODULATE VFD.
   d. CONTROL THE STAGING OF COMPRESSORS TO MAINTAIN COOLING SUPPLY AIR TEMPERATURE (SAT) SETPOINT.
   d. CONTROL THE STAGING OF GAS HEAT TO MAINTAIN HEATING SUPPLY AIR TEMPERATURE (SAT) SETPOINT.
   e. CONTROL THE OUTDOOR AIR, EXHAUST AIR AND BYPASS DAMPERS FOR ENTHALPY BASED ECONOMIZER MODE TO MAINTAIN SAT SETPOINT.

2. THE ERU CONTROLLER SHALL USE A SPACE TEMPERATURE/HUMIDITY INPUTS TO RESET THE DISCHARGE TEMPERATURE.

F. SUPPLY FAN OPERATION:

1. THE CONTROLLER SHALL ENABLE THE SUPPLY FAN TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

G. RTU TEMPERATURE CONTROL:

1. RTUs SHALL ONLY HAVE COOLING AND HEATING TEMPERATURE CONTROL MODE OF OPERATION.

2. THE RTU INTERNAL TEMPERATURE CONTROLLER SHALL ENABLE DX COOLING OR GAS FIRED HEATING AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT.

3. BMS SHALL MONITOR THE SPACE TEMPERATURE/HUMIDITY THRU THE BACNET LINK AND SHALL DISPLAY THE SPACE TEMPERATURE AT THE BMS HMI.

4. THE RTU SAT SETPOINT SHALL BE A WRITABLE VALUE TO THE RTU CONTROLLER FROM THE BMS HMI VIA BACNET.

5. THE RTU CONTROLLER SHALL INITIATE THE HEATING MODE. THE SIGNAL SHALL BE THE SPACE TEMPERATURE WHENEVER THE RTU IS RUNNING AND THE SPACE TEMPERATURE DROPS BELOW 68 DEG F (ADJ.) FOR 5 MINUTES (ADJ.) THE BMS SHALL COMMAND THE RTU CONTROLLER TO ENABLE THE GAS HEATING STAGES AS REQUIRED TO MAINTAIN SPACE HEATING SETPOINT. THE HEATING SHALL BE DISABLED BY THE RTU CONTROLLER WHEN THE AVERAGE SPACE TEMPERATURE RISES ABOVE 70 DEG F (ADJUSTABLE).

6. THE CONTROLLER SHALL MONITOR SPACE TEMPERATURE AND SPACE HUMIDITY WITH NIST CERTIFIED SENSORS. ALL OF THE SPACE TEMPERATURE/HUMIDITY SENSORS SHALL BE AVERAGED, AND ALL THE COOLING STAGES, AND GAS HEATING STAGES SHALL BE TURNED ON AND OFF TOGETHER FOR ALL CASINO RTU'S. ECONOMIZER POSITIONS, SETPOINTS AND STAGING SHALL ALSO BE OPERATED TOGETHER. THE SPACE AIR MIXING SOLUTION WILL KEEP THE ENTIRE SPACE AT NEARLY UNIFORM TEMPERATURE.

A 75°F/50%RH (ADJ.) COOLING SETPOINT
A 70°F (ADJ.) HEATING SETPOINT

7. ZONE SETPOINT ADJUST. ZONE TEMPERATURE SETPOINTS SHALL BE ADJUSTABLE AT THE BMS WORKSTATION ONLY, WITH NO OCCUPANT ADJUSTMENT AT THE ZONE SENSOR.

H. VOLUME CONTROL

1. THE SUPPLY AND EXHAUST FANS ARE PROVIDED WITH VFD'S TO PROVIDE A METHOD OF REDUCING ENERGY DURING NIGHT TIMES WHEN THERE IS A REDUCTION IN LOAD AND PEOPLE IN THE SPACE.

2. THE FAN SHALL RUN IN VARIABLE VOLUME FLOW AS SCHEDULED. THE MINIMUM AIR FLOW SHALL ALWAYS EXCEED THE MINIMUM REQUIRED OUTDOOR AIRFLOW AS SCHEDULED.

3. ONCE THE SPACE TEMPERATURE SETPOINT IS MET AND CONFIRMED, THE BMS SHALL MODULATE AIR FLOW THROUGH SUPPLY VFD TO MAINTAIN SPACE SETPOINT. DURING THIS TIME BMS SHALL MAINTAIN THE SAME DISCHARGE TEMPERATURE.

I. COOLING MODE

1. THE CONTROLLER SHALL MEASURE THE AVERAGE ZONE TEMPERATURE AND STAGE THE COOLING TO MAINTAIN COOLING SETPOINT. TO PREVENT SHORT CYCLING, THERE SHALL BE A USER DEFINABLE (ADJ.) DELAY BETWEEN STAGES, AND EACH STAGE SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME. THE COOLING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS GREATER THAN 45°F (ADJ.).
- AND THE ECONOMIZER IS NOT ABLE TO MAINTAIN SPACE SETPOINT. ECONOMIZER AND DX COOLING SHALL BE ALLOWED TO OPERATE SIMULTANEOUSLY. SEE ECONOMIZER SECTION FOR ENTHALPY BASED CONTROL.
- AND THE ZONE TEMPERATURE IS ABOVE COOLING SETPOINT.
- AND THE SUPPLY FAN STATUS IS ON.
- AND THE HEATING IS NOT ACTIVE.

J. GAS HEATING MODE:

1. THE CONTROLLER SHALL MEASURE THE AVERAGE ZONE TEMPERATURE AND STAGE THE HEATING TO MAINTAIN HEATING SETPOINT.

- THE HEATING SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).
- AND THE ECONOMIZER IS AT MINIMUM POSITION.
- AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.
- AND THE SUPPLY FAN STATUS IS ON.
- AND THE COOLING IS NOT ACTIVE.

K. ECONOMIZER MODE:

1. THE RTU CONTROL SYSTEM SHALL HAVE ENTHALPY BASED ECONOMIZER CYCLE. SYSTEM SHALL COMPARE OUTSIDE AIR ENTHALPY WITH EXHAUST AIR ENTHALPY (CALCULATED BY BMS SYSTEM USING TEMPERATURE AND HUMIDITY). WHEN OUTSIDE AIR ENTHALPY IS LESS THAN EXHAUST AIR ENTHALPY, ENTHALPY ECONOMIZER WILL BE AVAILABLE. WHEN ENTHALPY ECONOMIZER IS AVAILABLE, SYSTEM SHALL CLOSE THE RETURN MOTORIZED DAMPER AND OPEN THE OUTSIDE AIR DAMPER TO FULL OPEN POSITION AND DEACTIVATE THE ENERGY RECOVERY WHEEL FROM ROTATING. WHEN OUTSIDE AIR ENTHALPY EXCEEDS EXHAUST AIR ENTHALPY (ADJUSTABLE DEADBAND), DDC SYSTEM SHALL DISENGAGE ECONOMIZER MODE, ENERGY RECOVERY WHEEL BYPASS DAMPERS SHALL BE CLOSED AND THE ENERGY RECOVERY WHEEL SHALL ACTIVATED.

2. THE BMS SHALL MONITOR TEMPERATURE, RELATIVE HUMIDITY AND CALCULATED ENTHALPY FOR OA THROUGH THE BACNET LINK.

3. WHEN IN ECONOMIZER MODE THE BMS SHALL INCREASE THE EXHAUST FAN SPEED AND MODULATE THE FAN TO MAINTAIN THE BUILDING PRESSURE SETPOINT.

L. BUILDING PRESSURE CONTROL:

1. THE EXHAUST FAN SHALL MODULATE TO MAINTAIN THE BUILDING PRESSURE SETPOINT.

M. DEHUMIDIFICATION MODE:

1. WHEN THE UNIT IS IN COOLING MODE AND THE SPACE TEMPERATURE SETPOINT IS SATISFIED, WHEN THE SPACE HUMIDITY IS GREATER THAN THE SETPOINT (60% RH (ADJ.) DEHUMIDIFICATION MODE SHALL BE ACTIVATED.
2. THE SUPPLY FAN VFD SHALL INCREASE THE FAN SPEED TO MAINTAIN MAX AIRFLOW.
3. THE UNIT SHALL STAGE ITS COOLING TO MAINTAIN A COOLING COIL LAT OF 55°F AND ACTIVATE THE REHEAT COIL TO SUPPLY AIR TO THE SPACE AT A TEMPERATURE OF 72°F (ADJ.).
4. ONCE THE SPACE HUMIDITY IS LESS THAN THE SETPOINT THE UNIT SHALL OPERATE IN ITS NORMAL MODE.

N. FILTER STATUS:

1. A DIFFERENTIAL PRESSURE INDICATING SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER(S). IF THE SWITCH CLOSES WHEN THE FAN IS RUNNING FOR 1 MINUTE OR AFTER FAN START, A DIRTY FILTER ALARM SHALL BE ANNUNCIATED AT THE BMS HMI.

O. LOSS OF POWER:

1. THE BMS WILL SEND A RE-START COMMAND SIGNAL TO THE RTU CONTROLLER AFTER RECOVERY FROM A POWER FAILURE.

P. SHUTDOWN CONTROL:

1. RTUS SHALL SHUT DOWN BY THE FOLLOWING SIGNALS:
   a. SAFETY CIRCUIT SHUT DOWN (SD) TERMINAL.
   b. FAILED SUPPLY AIR (SA) TEMPERATURE SENSOR.
   c. FAILED RETURN AIR (RA) TEMPERATURE SENSOR.
   d. FAN PROOF.

2. RTUS SHALL ALSO BE MANUALLY SHUTDOWN BY OPERATOR THROUGH BMS HMI.

3. WHEN THE RTU IS STOPPED BY THE BMS BY OPENING THE START (OCCUPIED) CONTACT SIGNAL, THE UNITS CONTROLLER WILL PLACE THE RTU IN UNOCCUPIED MODE. TO PREVENT THE RTU FROM STARTING UNDER UNOCCUPIED MODE THE RTU CONTROLLER SETTINGS FOR SETBACK OPERATION SHALL BE DISABLED.

4. THE UNIT'S CONTROLLER SHALL COMMAND THE SUPPLY FAN TO SHUT DOWN INTO UNOCCUPIED MODE AND THE RETURN FAN SHALL ALSO SHUT DOWN AS IT SHALL BE INTERLOCKED TO ALLOW OPERATION ONLY WHEN THE SUPPLY FAN IS RUNNING.

5. A SAFETY SHUTDOWN BY SMOKE DETECTOR WILL REQUIRE THE RTU TO BE MANUALLY STARTED FROM THE BMS HMI AFTER THE SAFETY SHUTDOWN HAS BEEN CLEARED.

Q. CARBON DIOXIDE (CO2) MONITORING:
1. WHEN IN THE OCCUPIED MODE, THE BMS SHALL MONITOR THE SPACE CO2 LEVELS

R. FAN STATUS:

1. THE SUPPLY/EXHAUST FAN RUNNING STATUS SHALL BE PROVIDED BY THE AIR PROVING SWITCH THROUGH THE BACNET LINK.

S. EXHAUST FAN CONTROL:

1. RTU CONTROL SYSTEM SHALL MODULATE THE EXHAUST FAN VFD TO MAINTAIN BUIDING PRESSURE SETPOINT. INITIALLY SET AT +0.05" (ADJ.).

2. THE BMS SHALL MEASURE BOTH BUILDING STATIC PRESSURE AND SHALL BE AVERAGED TO KEEP THE ENTIRE SPACE AT NEARLY UNIFORM TEMPERATURE.

3. THE EXHAUST FAN VFD SPEED SHALL NOT DROP BELOW 20% (adj.) AND SHALL ALSO BE OPERATED TOGETHER.

T. ENERGY RECOVERY WHEEL

1. ENERGY RECOVERY WHEEL SHALL BE CONTROLLED TO MAXIMIZE ENERGY TRANSFER FROM EXHAUST AIR TO SUPPLY AIR.

2. THE ERU CONTROLLER SHALL MONITOR THE ENTERING AND DISCHARGE SIDE OF BOTH THE SUPPLY AND EXHAUST AIR STREAMS FOR DRY BULB AND WET BULB TEMPERATURES.

3. THE ERU CONTROLLER SHALL INTERFACE WITH THE BAS FOR SETPOINT ADJUSTMENT, ALARM, TROUBLE, AND SENSOR VALUES.

4. BAS SHALL TREND ALL SENSED VALUES FOR ALL FOUR (4) AIR MONITORED POINTS BY TIME REFERENCE.

5. THE ENTHALPY WHEEL SHALL MODULATE FOR FROST CONTROL.

6. THE ENTHALPY WHEEL DEFROST CYCLE SHALL BE INITIATE WHEN:

   a. WHEN THE OUTSIDE AIR DRY BULB TEMPERATURE IS LOWER THAN THE EXHAUST AIR FROST DRY-BULB TEMPERATURE.

   b. IF THE EXHAUST AIR PRESSURE DROP ACROSS THE ENTHALPY RISES ABOVE SETPOINT.

   c. THE SYSTEM SHALL REMAIN IN DEFROST CYCLE UNTIL THE ENTHALPY PRESSURE DROP RETURNS TO ITS ORIGINAL SETPOINT.

U. HISTORIES/TRENDING & REPORTS

1. THE BAS SOFTWARE SHALL BE CAPABLE OF RECORDING AND PRODUCING REPORTS TO DOCUMENT ALL READINGS ASSOCIATED WITH EACH RTU DEVICE SHOWN. INCLUDE GRAPHING CAPABILITY IN REPORT GENERATING SOFTWARE. DATA RECORDING SHALL BE CAPABLE OF STORING HOURLY READINGS, DAILY AVERAGE READING, WEEKLY AVERAGE READING AND MONTHLY AVERAGE READING. SOFTWARE SHALL ALSO BE CAPABLE OF REPORTING DAILY AND MONTHLY HIGH/LOW PEAK READINGS.

1 PHASE 2 (AREA N) - SEQUENCE OF OPERATION FOR MULTIPURPOSE ROOM ROOFTOP UNITS (RTU-M02 - RTU-M05)
CONTROL DIAGRAM

Additions and Renovations to Harrah's Cherokee Valley River

777 Casino Parkway
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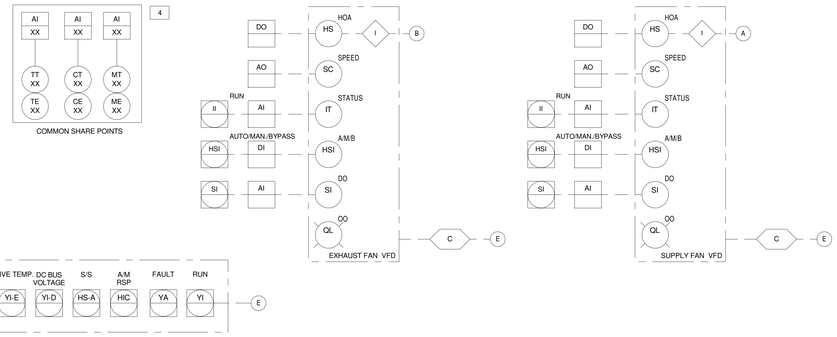
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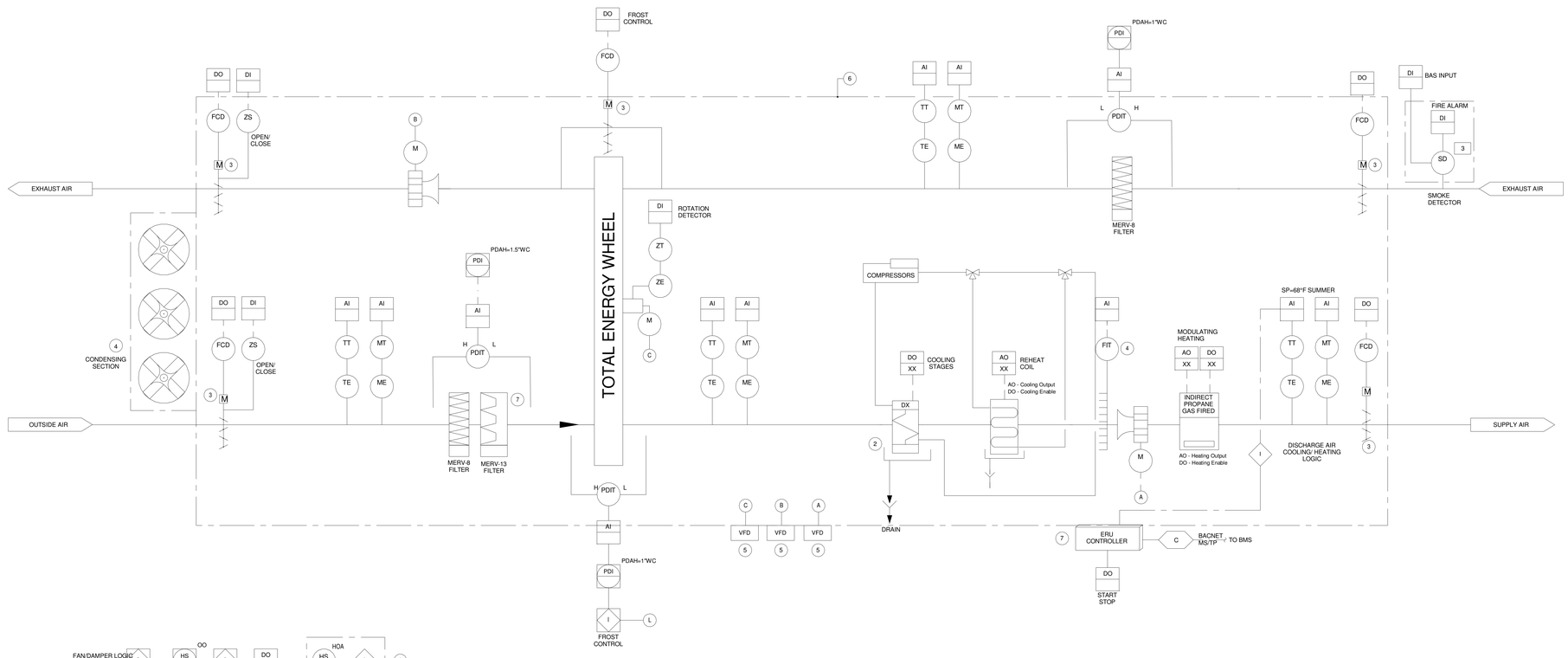
HVAC CONTROLS

M-808

1/30/2023 11:21:57 AM DRAWING PRINTED FULL SIZE (18X24) + 36"x48" DRAWING PRINTED HALF SIZE (12X) (IF ON A SHEET 18"x24" WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES.) DRAWING PRINTED SCALE: 1" PAPER SIZE (27.75") = 11.25'x15.5" WILL FIT (TEXT) OR 1"x1" INDIVIDUAL 3", 6", 1/8", 1/16" AND 1/32" VIEW SCALES WILL THROUGH BY MAILSTRIPING THE DENOMINATOR BY 8 AND MAKING THE NUMERATOR 3 FOR EXAMPLE 1/8"=1'-0" (1/3") WILL BE 3/8"=1'-0" FOR SCALES AT 3/8", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR/DOUBLE/ AND CHANGE THE NUMERATOR TO 1. EXAMPLE 3/4"=1'-0" (1/16) WILL BE 3/4

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1 CONSTANT VOLUME ENERGY RECOVERY UNIT W/ ENTHALPY WHEEL (ERV-H01)
P&ID

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2. REFER TO DRAWING M-801 FOR INSTRUMENTATION SYMBOLS AND LEGEND.
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HVAC CONTROLS

M-809

1/30/2023 11:22:00 AM DRAWING PRINTED FULL SIZE (30"H) + 24"x9" DRAWING PRINTED HALF SIZE (15"H) + 24"x9" DRAWING PRINTED ON ALL OTHER SIZES | DRAWING PRINTED SCALE: 1" THIS SIZE (1" BY) = 1'-0" (1/12"H) 1" BELL 3/4"=1'-0" FOR SCALES AT 24", 36", 1/16" AND 1/32" 1/8" THE TRANSLATION IS CODE ENOUGH TO USE THE ENGINEMATOR ESSENTIALLY AND CHANGE THE NUMERATION TO 1 1/4"(1/8") AT 1/4"=1'-0" (3/16") BELL BE

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GENERAL

1. REQUIREMENTS OF "SEQUENCE OF OPERATION - GENERAL" ON DWG. M-801 APPLY TO ALL SEQUENCES. THIS SEQUENCE APPLIES TO ALL CONSTANT VOLUME HOTEL ERUS.
2. ALL SETPOINTS AND TIME DELAYS MENTIONED SHALL BE ADJUSTABLE BY THE OPERATOR WITHOUT ANY HARDWARE OR SOFTWARE REVISIONS.
3. THIS CONTROL SEQUENCE APPLIES TO ALL ERU'S POINTS SHOWN ON THE DIAGRAM AND REQUIRED BY THE SEQUENCES ARE TYPICAL FOR THIS AIR HANDLING UNIT.
4. FILTER STATUS SHALL BE MONITORED BY A DIFFERENTIAL PRESSURE INDICATOR. INDICATOR SHALL BE MOUNTED ON THE ERU CASING.
5. ERU FAN STATUS SHALL BE MONITORED BY THE BAS VIA A CURRENT SWITCH.
6. END SWITCHES SHALL VERIFY POSITION OF OUTSIDE & EXHAUST AIR DAMPERS.
7. WHENEVER THE UNIT IS OFF PER THE CONTROL SYSTEM OR MAIN POWER IS DISCONNECTED, THE CONTROL DEVICES FOR THE UNIT SHALL GO TO THEIR FAIL-SAFE POSITION.
8. FAIL-SAFE POSITIONS ARE POSITION THAT DEVICES WILL GO TO WHEN DE-ENERGIZED: NO = NORMALLY OPEN, NC = NORMALLY CLOSED.

SAFETIES

1. THE FOLLOWING SAFETIES, EACH WITH INDIVIDUAL MANUAL RESETS, SHALL SHUT DOWN THE ERU FAN AND INITIATE A SPECIFIC ALARM NOTICE AT THE BAS AFTER LISTED TIME DELAYS:
   a. STATIC PRESSURE HIGH LIMIT SWITCH INDICATES THAT THE DISCHARGE PRESSURE OF THE SUPPLY FAN IS 4.0" OR GREATER - DELAY NONE.
   b. STATIC PRESSURE LOW LIMIT SWITCH INDICATES THAT THE SUCTION STATIC PRESSURE OF THE EXHAUST FAN IS 4.5" VACUUM RELATIVE TO THE PENTHOUSE OR LESS - DELAY NONE.

HISTORIES/TRENDING & REPORTS

1. THE BAS SOFTWARE SHALL BE CAPABLE OF RECORDING AND PRODUCING REPORTS TO DOCUMENT ALL READINGS ASSOCIATED WITH EACH ERU DEVICE SHOWN. INCLUDE GRAPHING CAPABILITY IN REPORT GENERATING SOFTWARE. DATA RECORDING SHALL BE CAPABLE OF STORING HOURLY READINGS, DAILY AVERAGE READING, WEEKLY AVERAGE READING AND MONTHLY AVERAGE READING. SOFTWARE SHALL ALSO BE CAPABLE OF REPORTING DAILY AND MONTHLY HIGH/LOW PEAK READINGS.

ALARMS

1. THE FOLLOWING SHALL INITIATE SPECIFIC ALARM NOTICES AT THE BAS:
   a. ERU FAN IS COMMANDED TO RUN AND THE BAS SENSES NO STATUS - DELAY 15 SECONDS.
   b. AUXILIARY ALARM CONTACTS IN THE ERU FAN VARIABLE FREQUENCY DRIVES (VFDs) INDICATES A FAILURE OF THE VFD - DELAY 15 SECONDS.
   c. ERU VFD HOA SWITCH INDICATES SWITCH IS NOT IN THE AUTO POSITION - DELAY 60 SECONDS.
   d. DISCHARGE AIR TEMPERATURE IS ABOVE 75°F OR BELOW 60°F WHEN ERU STATUS IS ON - DELAY 5 MINUTES.
   e. DISCHARGE STATIC PRESSURE DECREASES BELOW 1.0" (ADJ) WHEN THE ERU STATUS IS ON - DELAY 10 MINUTES.
   f. FILTER DIFFERENTIAL PRESSURE RISES TO 0.25" BELOW THE TOTAL OF THE COMBINED MAXIMUM DIRTY FILTER PRESSURE DROP INDICATED IN THE FILTER SCHEDULE - DELAY 10 MINUTES.
   g. END SWITCHES DO NOT INDICATE APPROPRIATE DAMPER POSITION - DELAY 5 MINUTES.
   h. ALL CONTROL SYSTEM SENSORS SHALL HAVE A HIGH AND LOW SOFTWARE ALARM LIMIT TO INDICATE TEMPERATURE PROBLEMS OR A FAULTY SENSOR.
   i. IF FAILURE OF THE AIR HANDLER OCCURS DURING AN AUTOMATIC START, TWO ADDITIONAL ATTEMPTS SHALL BE MADE. EACH SUBSEQUENT ATTEMPT AT RESTART WILL NOT BEGIN UNTIL ALL DAMPERS ARE IN THEIR FAIL-SAFE POSITION. AFTER THE FINAL ATTEMPT AT RESTART, THE ERU SHALL BE LOCKED OUT AND A SPECIFIC ALARM SHALL BE INITIATED AT THE BAS. WHEN AN ERU IS COMMANDED TO STOP, THE FOLLOWING SHALL OCCUR:

1) THE SUPPLY FAN VFD SHALL BE DE-ENERGIZED AND THE OUTDOOR AIR DAMPER SHALL BE CLOSED. THE EXHAUST DAMPER SHALL BE CLOSED, AND THE CLOSED POSITION OF THE DAMPERS SHALL BE PROVEN BY THE END SWITCH.

   j. WHENEVER A UNIT IS SHUT DOWN BECAUSE OF ONE OF THE SAFETIES, THE CONTROL SYSTEM SHALL RETAIN IN MEMORY THE READING AND SETPOINT OF EACH DEVICE TO HELP THE OPERATOR IN ISOLATING THE REASON FOR THE PROBLEM.

UNOCCUPIED CYCLE (ONLY IF BUILDING IS COMPLETELY UNOCCUPIED)

1. UNIT SHALL BE OFF.
2. WHENEVER UNIT IS OFF THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL BE CLOSED.

VOLUME CONTROL

1. THE SUPPLY AND EXHAUST FANS SHALL RUN CONTINUOUSLY DURING NORMAL OPERATION PROVIDING A CONSTANT VOLUME OF SUPPLY AIR.
2. DIVISION 23 SHALL INITIALLY ADJUST THE STATIC PRESSURE SETPOINT TO 0.5" AND THEN RE-ADJUST THE VALUE AS REQUIRED TO PROVIDE ADEQUATE AIR FLOW AS DETERMINED DURING SYSTEM BALANCING. FINAL SETPOINT SHALL BE THE LOWEST PRESSURE REQUIRED TO PROVIDE FULL FLOW AT THE MOST REMOTE LOCATION.
3. AIR VOLUME FROM THE ERU SHALL BE MONITORED BY THE BAS THROUGH THE UNIT MOUNTED AIR FLOW MONITORING STATION.
4. THE EXHAUST FAN SPEED SHALL TRACK THE SUPPLY FAN BY THE PRESET DIFFERENTIAL AS OUTLINED IN THE EQUIPMENT SCHEDULES.

NORMAL OPERATION

1. ERU SHALL BE STARTED AND STOPPED FROM THE BAS OR LOCALLY BY PLACING THE ASSOCIATED VFD HOA SWITCH IN THE HAND POSITION.
2. THE ERU SHALL RUN CONTINUOUSLY WHILE THE BUILDING IS OCCUPIED.
3. NORMAL START UP OF THE ERU SHALL BE INITIATED VIA MANUAL INPUT TO THE BAS. ONCE THE INITIAL COMMAND IS INPUT TO THE BAS, THE FOLLOWING SHALL OCCUR:
   a. UPON START-UP COMMAND OUTSIDE AIR SUPPLY, RETURN AND EXHAUST ISOLATION DAMPERS SHALL OPEN. ONCE ISOLATION DAMPERS ARE PROVED OPEN, THE UNIT FANS SHALL START. EXHAUST FAN SHALL START FIRST FOLLOWED BY THE SUPPLY FAN IN 15 SECONDS. THE SUPPLY AND EXHAUST FANS SHALL RUN CONTINUOUSLY.
   b. DAT SHALL BE MAINTAINED AT 68°F.
   c. THE CONTROL SYSTEM SHALL HAVE ENTHALPY BASED ECONOMIZER CYCLE. DDC SYSTEM SHALL COMPARE OUTSIDE AIR ENTHALPY WITH EXHAUST AIR ENTHALPY (CALCULATED BY DDC SYSTEM USING TEMPERATURE AND HUMIDITY). WHEN OUTSIDE AIR ENTHALPY IS LESS THAN EXHAUST AIR ENTHALPY, ENTHALPY ECONOMIZER WILL BE AVAILABLE. WHEN ENTHALPY ECONOMIZER IS AVAILABLE, DDC SYSTEM SHALL OPEN BOTH ENERGY RECOVERY WHEEL BYPASS DAMPERS TO FULL OPEN POSITION AND DEACTIVATE THE ENERGY RECOVER WHEEL FROM ROTATING. WHEN OUTSIDE AIR ENTHALPY EXCEEDS EXHAUST AIR ENTHALPY (ADJUSTABLE DEADBAND), DDC SYSTEM SHALL DISENGAGE ECONOMIZER MODE. ENERGY RECOVERY WHEEL BYPASS DAMPERS SHALL BE CLOSED AND THE ENERGY RECOVER WHEEL SHALL ACTIVATE.

SUPPLY AIR TEMPERATURE CONTROL

1. CONTROL OF DISCHARGE AIR TEMPERATURE SHALL BE MAINTAINED WITHIN +/- 2°F OF SETPOINT. THE DISCHARGE TEMPERATURE SETPOINT OF 68°F SHALL BE MAINTAINED WHENEVER THE ERU IS OPERATING.
2. HEATING:

   IN HEATING MODE, THE ERU SHALL MODULATE THE GAS FURNACE TO MAINTAIN THE DAT SETPOINT,.
3. COOLING:

   ERU CONTROLLER WILL COOL THE AIR DOWN TO THE RANGE OF THE DESIGN TEMPERATURE TO REMOVE THE MOISTURE LOAD AT 55 DB/54WB AND THEN TO REHEAT THE AIR TO A HIGHER TEMPERATURE TO PREVENT OVERCOOLING THE SPACE. ERU CONTROLLER SHALL CONTROL THE DISCHARGE AIR TEMPERATURE AND BE MAINTAINED WITHIN +/- 2°F OF SETPOINT. THE DISCHARGE TEMPERATURE SETPOINT OF 68°F (HOT GAS REHEAT) SHALL BE MAINTAINED WHENEVER THE ERU IS OPERATING.

ENERGY RECOVERY WHEEL

1. ENERGY RECOVERY WHEEL SHALL BE CONTROLLED TO MAXIMIZE ENERGY TRANSFER FROM EXHAUST AIR TO SUPPLY AIR.
2. THE ERU CONTROLLER SHALL MONITOR THE ENTERING AND DISCHARGE SIDE OF BOTH THE SUPPLY AND EXHAUST AIR STREAMS FOR DRY BULB AND WET BULB TEMPERATURES.
3. THE ERU CONTROLLER SHALL INTERFACE WITH THE BAS FOR SETPOINT ADJUSTMENT, ALARM, TROUBLE, AND SENSOR VALUES.
4. BAS SHALL TREND ALL SENSED VALUES FOR ALL FOUR (4) AIR MONITORED POINTS BY TIME REFERENCE.
5. THE ENTHALPY WHEEL SHALL CONTINUE TO ROTATE DURING THE DEFROST CYCLE.
6. THE ENTHALPY WHEEL DEFROST CYCLE SHALL BE INITIATE WHEN:
   a. WHEN THE OUTSIDE AIR DRY BULB TEMPERATURE IS LOWER THAN THE EXHAUST AIR FROST DRY-BULB TEMPERATURE.
   b. IF THE EXHAUST AIR PRESSURE DROP ACROSS THE ENTHALPY RISES ABOVE SETPOINT.
   c. UPON ACTIVATION OF THE DEFROST CYCLE THE OUTSIDE AIR ENTHALPY WHEEL BYPASS DAMPER SHALL MODULATE OPEN. THE GAS HEATING SHALL BE STAGED TO MAINTAIN DISCHARGE AIR TEMPERATURE AND THE ENTHALPY WHEEL EXHAUST BYPASS DAMPER SHALL REMAIN CLOSED.
   d. THE SYSTEM SHALL REMAIN IN DEFROST CYCLE UNTIL THE ENTHALPY WHEEL PRESSURE DROP RETURNS TO ITS ORIGINAL SETPOINT.

LOSS OF POWER / FAILURE TO START

1. IN AN EVENT WHERE EITHER OF THE GUESTROOM ERUs (ERU-01 AND ERU-02), THE ERU IN QUESTION SHALL FOLLOW THE BELOW SEQUENCE:
   a. ERU OA AND RA DAMPERS SHALL FAIL CLOSE.
   b. CORRESPONDING EMERGENCY EXHAUST FAN(S) DAMPER SHALL OPEN.
   c. ONCE CORRESPONDING EMERGENCY EXHAUST FAN(S) DAMPER PROVES OPEN, FAN SHALL ENERGIZE.

1 CONSTANT VOLUME ENERGY RECOVERY UNIT W/ ENTHALPY WHEEL (ERV-H01)
CONTROL SEQUENCE

Additions and Renovations to Harrah's Cherokee Valley River

777 Casino Parkway
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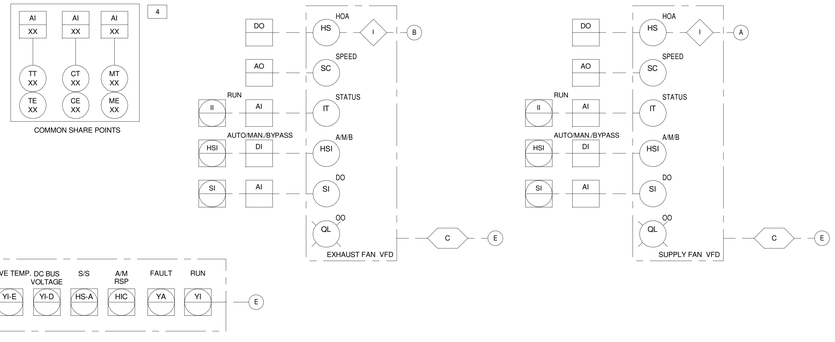
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ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	NTS
REVISIONS	

HVAC CONTROLS

M-810

1/30/2023 11:22:03 AM DRAWING PRINTED FULL SIZE (30X42) - IN HALF - DRAWING PRINTED HALF SIZE (15X21) WILL FIT ON A SHEET - IN HALF WIDTH, 1.5" OF EXTRA SPACE ON ALL FOUR SIDES | DRAWING PRINTED SCALE: 1 THREE SIZE (27.75") = 11.25X15.5" WILL FIT ITS ENTIRY ON A 11"x17" INDIVIDUAL 2.5", 24", 1.5", 1.5" AND 1.5" VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 8 AND MAKING THE NUMERATOR 0 TO 1 EXAMPLE 1.5"=1'-0" (1/8") WILL BE 3/4"=1'-0" FOR EXAMPLE 3/4"=1'-0" (1/16") WILL FIT ON A SHEET - IN HALF - DRAWING PRINTED HALF SIZE (15X21) WILL FIT ON A SHEET - IN HALF WIDTH, 1.5" OF EXTRA SPACE ON ALL FOUR SIDES | DRAWING PRINTED SCALE: 1 THREE SIZE (27.75") = 11.25X15.5" WILL FIT ITS ENTIRY ON A 11"x17" INDIVIDUAL 2.5", 24", 1.5", 1.5" AND 1.5" VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 8 AND MAKING THE NUMERATOR 0 TO 1 EXAMPLE 1.5"=1'-0" (1/8") WILL BE 3/4"=1'-0" FOR EXAMPLE 3/4"=1'-0" (1/16")

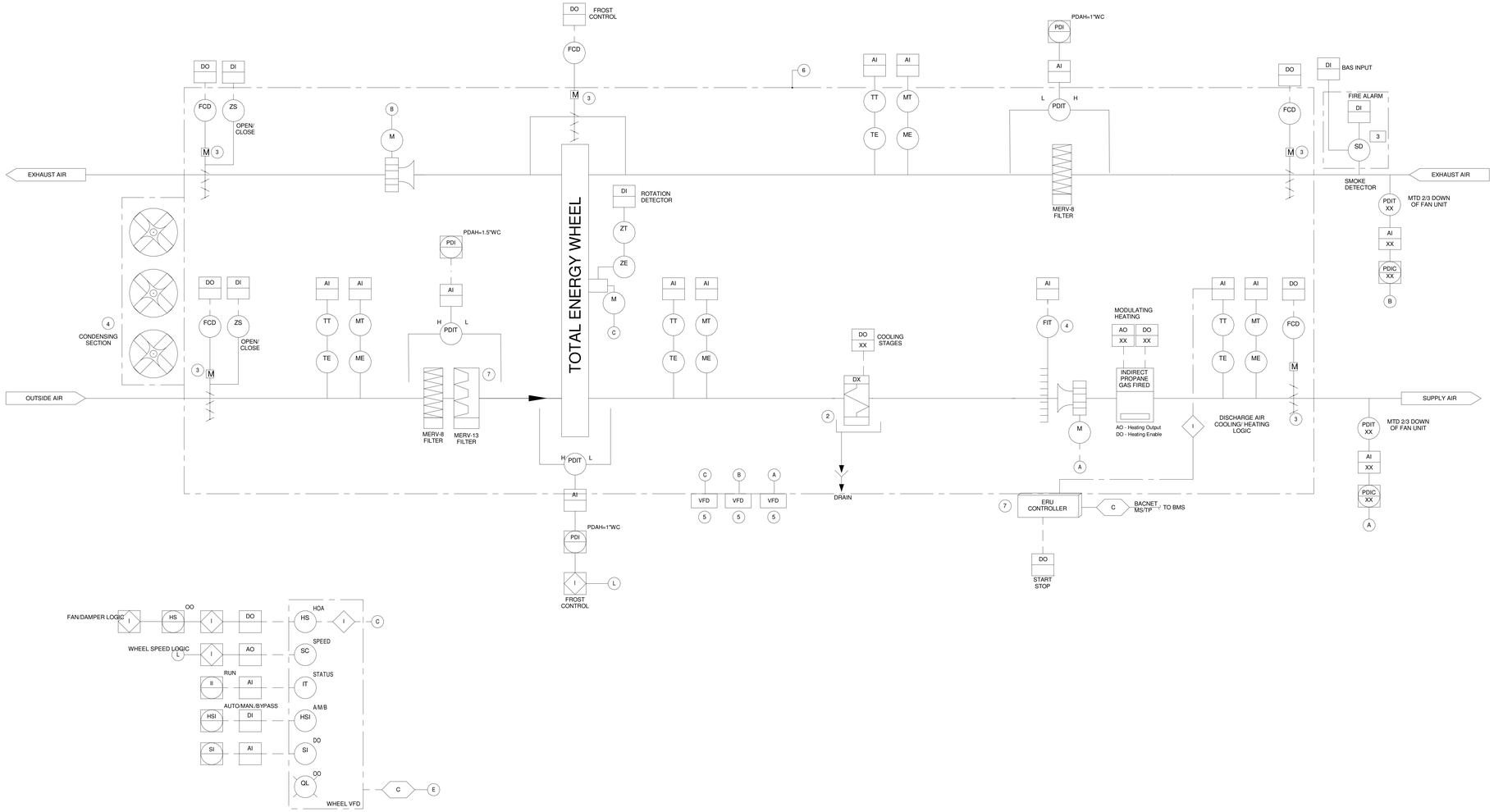


GENERAL NOTES :

1. REFER TO SEQUENCE OF OPERATION ON DRAWING H8 SERIES DRAWINGS.
2. REFER TO DRAWING M-801 FOR INSTRUMENTATION SYMBOLS AND LEGEND.
3. THE FOLLOWING SYMBOLS INDICATE POINT OF RESPONSIBILITY.
   - 1 PROVIDED AND INSTALLED BY UNIT MANUFACTURER
   - 2 PROVIDED BY UNIT MANUFACTURER, INSTALLED BY ATC CONTRACTOR.
   - 3 BY LSS/ FIRE ALARM CONTRACTOR
   - 4 FURNISHED AND INSTALLED BY ATC CONTRACTOR.
4. FOR SCHEDULES REFER TO M-600 SERIES DRAWINGS.

KEY NOTES :

1. THE COMPRESSOR/FURNACE CONTROLS ARE PART OF A PACKAGED SYSTEM BY THE MANUFACTURER AND ARE NOT INDICATED ON THIS CONTROL DIAGRAM. THE PACKAGED SYSTEM SHALL SEQUENCE THE COMPRESSORS/FURNACE AS REQUIRED TO MAINTAIN SET-POINT. THE ASSOCIATED CONTROLS ARE INDICATED WITHIN THE SPECIFICATION. ALL CONTROL POINTS AND ALARMS SHALL BE MONITORED THROUGH THE BACNET TO THE BMS.
2. PIPE CONDENSATE TO DRAIN, FULL SIZE BASE ON UNIT MANUFACTURER.
3. DAMPERS/ACTUATOR PROVIDED BY UNIT MANUFACTURER.
4. FAN INLET AIR FLOW MONITORING SENSOR FURNISHED AND INSTALLED BY UNIT MANUFACTURER.
5. VFD TO BE PROVIDED BY AHU MANUFACTURER.
6. ALL CONTROL POINTS , DEVICES, ETC. SHOWING INSIDE THE AHU BOUNDARY SHALL BE PROVIDED BY ERU MANUFACTURER.
7. ENERGY RECOVERY UNIT (RTU) IS FURNISHED WITH A COMPLETE SELF CONTAINED DDC SYSTEM. MANUFACTURER TO FURNISH BACNET INTEGRATOR TO TIE INTO THE BUILDING DDC CONTROL SYSTEM FOR MONITORING AND CONTROL.



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BULLETIN 08
05/12/2023

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DRAWN	MWM
SCALE	NTS

REVISIONS

11 05/12/2023 BULLETIN 08

HVAC CONTROLS

M-811

5/12/2023 8:06:49 AM DRAWING PRINTED FULL SIZE (30"H) - IF NOT 30"HIGH DRAWING PRINTED AT A SIZE OTHER FULL SIZE, IMAGES WILL NOT SCALE CORRECTLY. CHECK THE GRAPHIC SCALE BAR AND THE NUMBER OF INCHES ON THIS SHEET. IF NOT 30" AND 360° THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. EXAMPLE: 24"=1/2" IF A 2" LINE WILL BE SHORTER TO 24"=1/2".

790

GENERAL

1. REQUIREMENTS OF "SEQUENCE OF OPERATION - GENERAL" ON DWG. M-801 APPLY TO ALL SEQUENCES. THIS SEQUENCE APPLIES TO ALL CONSTANT VOLUME HOTEL ERU'S.

2. ALL SETPOINTS AND TIME DELAYS MENTIONED SHALL BE ADJUSTABLE BY THE OPERATOR WITHOUT ANY HARDWARE OR SOFTWARE REVISIONS.

3. THIS CONTROL SEQUENCE APPLIES TO ALL ERU'S POINTS SHOWN ON THE DIAGRAM AND REQUIRED BY THE SEQUENCES ARE TYPICAL FOR THIS AIR HANDLING UNIT.

4. FILTER STATUS SHALL BE MONITORED BY A DIFFERENTIAL PRESSURE INDICATOR. INDICATOR SHALL BE MOUNTED ON THE ERU CASING.

5. ERU FAN STATUS SHALL BE MONITORED BY THE BAS VIA A CURRENT SWITCH.

6. END SWITCHES SHALL VERIFY POSITION OF OUTSIDE & EXHAUST AIR DAMPERS.

7. WHENEVER THE UNIT IS OFF PER THE CONTROL SYSTEM OR MAIN POWER IS DISCONNECTED, THE CONTROL DEVICES FOR THE UNIT SHALL GO TO THEIR FAIL-SAFE POSITION.

8. FAIL-SAFE POSITIONS ARE POSITION THAT DEVICES WILL GO TO WHEN
DE-ENERGIZED: NO = NORMALLY OPEN, NC = NORMALLY CLOSED.

SAFETIES

1. THE FOLLOWING SAFETIES, EACH WITH INDIVIDUAL MANUAL RESETS, SHALL SHUT DOWN THE ERU FAN AND INITIATE A SPECIFIC ALARM NOTICE AT THE BAS AFTER LISTED TIME DELAYS:

   a. STATIC PRESSURE HIGH LIMIT SWITCH INDICATES THAT THE DISCHARGE PRESSURE OF THE SUPPLY FAN IS 4.0" OR GREATER - DELAY NONE.

   b. STATIC PRESSURE LOW LIMIT SWITCH INDICATES THAT THE SUCTION STATIC PRESSURE OF THE EXHAUST FAN IS 4.5" VACUUM RELATIVE TO THE PENTHOUSE OR LESS - DELAY NONE.

HISTORIES/TRENDING & REPORTS

1. THE BAS SOFTWARE SHALL BE CAPABLE OF RECORDING AND PRODUCING REPORTS TO DOCUMENT ALL READINGS ASSOCIATED WITH EACH ERU DEVICE SHOWN. INCLUDE GRAPHING CAPABILITY IN REPORT GENERATING SOFTWARE. DATA RECORDING SHALL BE CAPABLE OF STORING HOURLY READINGS, DAILY AVERAGE READING, WEEKLY AVERAGE READING AND MONTHLY AVERAGE READING. SOFTWARE SHALL ALSO BE CAPABLE OF REPORTING DAILY AND MONTHLY HIGH/LOW PEAK READINGS.

ALARMS

1. THE FOLLOWING SHALL INITIATE SPECIFIC ALARM NOTICES AT THE BAS:

   a. ERU FAN IS COMMANDED TO RUN AND THE BAS SENSES NO STATUS - DELAY 15 SECONDS.

   b. AUXILIARY ALARM CONTACTS IN THE ERU FAN VARIABLE FREQUENCY DRIVES (VFDs) INDICATES A FAILURE OF THE VFD - DELAY 15 SECONDS.

   c. ERU VFD HOA SWITCH INDICATES SWITCH IS NOT IN THE AUTO POSITION - DELAY 60 SECONDS.

   d. DISCHARGE AIR TEMPERATURE IS ABOVE 75°F OR BELOW 60°F WHEN ERU STATUS IS ON - DELAY 5 MINUTES.

   e. DISCHARGE STATIC PRESSURE DECREASES BELOW 1.0" (ADJ) WHEN THE ERU STATUS IS ON - DELAY 10 MINUTES.

   f. FILTER DIFFERENTIAL PRESSURE RISES TO 0.25" BELOW THE TOTAL OF THE COMBINED MAXIMUM DIRTY FILTER PRESSURE DROP INDICATED IN THE FILTER SCHEDULE - DELAY 10 MINUTES.

   g. END SWITCHES DO NOT INDICATE APPROPRIATE DAMPER POSITION - DELAY 5 MINUTES.

   h. ALL CONTROL SYSTEM SENSORS SHALL HAVE A HIGH AND LOW SOFTWARE ALARM LIMIT TO INDICATE TEMPERATURE PROBLEMS OR A FAULTY SENSOR.

   i. IF FAILURE OF THE AIR HANDLER OCCURS DURING AN AUTOMATIC START, TWO ADDITIONAL ATTEMPTS SHALL BE MADE. EACH SUBSEQUENT ATTEMPT AT RESTART WILL NOT BEGIN UNTIL ALL DAMPERS ARE IN THEIR FAIL-SAFE POSITION. AFTER THE FINAL ATTEMPT AT RESTART, THE ERU SHALL BE LOCKED OUT AND A SPECIFIC ALARM SHALL BE INITIATED AT THE BAS. WHEN AN ERU IS COMMANDED TO STOP, THE FOLLOWING SHALL OCCUR:

1) THE SUPPLY FAN VFD SHALL BE DE-ENERGIZED AND THE OUTDOOR AIR DAMPER SHALL BE CLOSED. THE EXHAUST DAMPER SHALL BE CLOSED, AND THE CLOSED POSITION OF THE DAMPERS SHALL BE PROVEN BY THE END SWITCH.

   j. WHENEVER A UNIT IS SHUT DOWN BECAUSE OF ONE OF THE SAFETIES, THE CONTROL SYSTEM SHALL RETAIN IN MEMORY THE READING AND SETPOINT OF EACH DEVICE TO HELP THE OPERATOR IN ISOLATING THE REASON FOR THE PROBLEM.

NORMAL OPERATION

1. ERU SHALL BE STARTED AND STOPPED FROM THE BAS OR LOCALLY BY PLACING THE ASSOCIATED VFD HOA SWITCH IN THE HAND POSITION.

2. THE ERU SHALL RUN CONTINUOUSLY WHILE THE BUILDING IS OCCUPIED.

3. NORMAL START UP OF THE ERU SHALL BE INITIATED VIA MANUAL INPUT TO THE BAS. ONCE THE INITIAL COMMAND IS INPUT TO THE BAS, THE FOLLOWING SHALL OCCUR:

   a. UPON START-UP COMMAND OUTSIDE AIR SUPPLY, RETURN AND EXHAUST ISOLATION DAMPERS SHALL OPEN. ONCE ISOLATION DAMPERS ARE PROVED OPEN, THE UNIT FANS SHALL START. EXHAUST FAN SHALL START FIRST FOLLOWED BY THE SUPPLY FAN IN 15 SECONDS. THE SUPPLY AND EXHAUST FANS SHALL RUN CONTINUOUSLY.

   b. DAT SHALL BE MAINTAINED AT 55°F.

   c. THE CONTROL SYSTEM SHALL HAVE ENTHALPY BASED ECONOMIZER CYCLE. DDC SYSTEM SHALL COMPARE OUTSIDE AIR ENTHALPY WITH EXHAUST AIR ENTHALPY (CALCULATED BY DDC SYSTEM USING TEMPERATURE AND HUMIDITY). WHEN OUTSIDE AIR ENTHALPY IS LESS THAN EXHAUST AIR ENTHALPY, ENTHALPY ECONOMIZER WILL BE AVAILABLE. WHEN ENTHALPY ECONOMIZER IS AVAILABLE, DDC SYSTEM SHALL OPEN BOTH ENERGY RECOVERY WHEEL BYPASS DAMPERS TO FULL OPEN POSITION AND DEACTIVATE THE ENERGY RECOVER WHEEL FROM ROTATING. WHEN OUTSIDE AIR ENTHALPY EXCEEDS EXHAUST AIR ENTHALPY (ADJUSTABLE DEADBAND), DDC SYSTEM SHALL DISENGAGE ECONOMIZER MODE, ENERGY RECOVERY WHEEL BYPASS DAMPERS SHALL BE CLOSED AND THE ENERGY RECOVER WHEEL SHALL ACTIVATE.

STATIC PRESSURE AND VOLUMETRIC CONTROL:

1. SUPPLY FAN VFD SHALL BE MODULATED TO MAINTAIN STATIC PRESSURE SETPOINT AT THE STATIC PRESSURE SENSOR LOCATED 2/3 OF THE WAY DOWN THE SUPPLY DUCTWORK. AS SYSTEM REQUIREMENTS FOR AIR VOLUME INCREASE AND SYSTEM STATIC PRESSURE AT CONTROLLING SP DROPS BELOW SETPOINT, THE VFD'S SHALL SPEED UP. AS SYSTEM REQUIREMENTS FOR AIR VOLUME DECREASE AS SENSED BY AN INCREASE IN STATIC PRESSURE ABOVE SETPOINT AT THE STATIC PRESSURE SENSOR, THE VFD'S SHALL SLOW DOWN. PROVIDE ADEQUATE DIFFERENTIAL AROUND SETPOINT TO PREVENT EXCESSIVELY RAPID CHANGES IN AIR VOLUME.

2. INITIAL STATIC PRESSURE SETPOINT UPON AHU STARTUP SHALL BE DETERMINED BY CONTROLS CONTRACTOR. STATIC SETPOINT SHALL BE RESET EVERY 5 MINUTES BASED ON TERMINAL BOX DAMPER POSITION AS FOLLOWS.

3. THE BMS SHALL POLL ALL OF THE SUPPLY TERMINAL BOX DAMPER POSITIONS:

a. IF ANY DAMPER POSITION IS GREATER THAN 90% OPEN, STATIC PRESSURE SETPOINT SHALL BE INCREASED BY 0.05" W.G.

b. IF NO DAMPER POSITION IS GREATER THAN 70% OPEN STATIC PRESSURE SETPOINT SHALL BE DECREASED BY 0.05" W.G.

c. UPON SHUT DOWN OF AHU, STATIC PRESSURE SETPOINT SHALL BE RESET TO INITIAL SETPOINT.

3. EXHAUST FAN VFD SHALL BE MODULATED TO MAINTAIN STATIC PRESSURE SETPOINT AT THE STATIC PRESSURE SENSOR LOCATED 2/3 OF THE WAY DOWN THE EXHAUST DUCTWORK. AS SYSTEM REQUIREMENTS FOR AIR VOLUME INCREASE AND SYSTEM STATIC PRESSURE AT CONTROLLING SP DROPS BELOW SETPOINT, THE VFD'S SHALL SPEED UP. AS SYSTEM REQUIREMENTS FOR AIR VOLUME DECREASE AS SENSED BY AN INCREASE IN STATIC PRESSURE ABOVE SETPOINT AT THE STATIC PRESSURE SENSOR, THE VFD'S SHALL SLOW DOWN. PROVIDE ADEQUATE DIFFERENTIAL AROUND SETPOINT TO PREVENT EXCESSIVELY RAPID CHANGES IN AIR VOLUME.

4. INITIAL STATIC PRESSURE SETPOINT UPON AHU STARTUP SHALL BE DETERMINED BY CONTROLS CONTRACTOR AND SET TO MAINTAIN THE PRESET DIFFERENTIAL LISTED IN THE SCHEDULES. STATIC SETPOINT SHALL BE RESET EVERY 5 MINUTES BASED ON TERMINAL BOX DAMPER POSITION AS FOLLOWS.

5. THE BMS SHALL POLL ALL OF THE EXHAUST TERMINAL BOX DAMPER POSITIONS:

a. IF ANY DAMPER POSITION IS GREATER THAN 90% OPEN, STATIC PRESSURE SETPOINT SHALL BE INCREASED BY 0.05" W.G.

b. IF NO DAMPER POSITION IS GREATER THAN 70% OPEN STATIC PRESSURE SETPOINT SHALL BE DECREASED BY 0.05" W.G.

c. UPON SHUT DOWN OF AHU, STATIC PRESSURE SETPOINT SHALL BE RESET TO INITIAL SETPOINT.

SUPPLY AIR TEMPERATURE CONTROL

1. CONTROL OF DISCHARGE AIR TEMPERATURE SHALL BE MAINTAINED WITHIN +/- 2°F OF SETPOINT. THE DISCHARGE TEMPERATURE SETPOINT OF 55°F (ADJ.) SHALL BE MAINTAINED WHENEVER THE ERU IS OPERATING.

2. HEATING:

   IN HEATING MODE, THE ERU SHALL MODULATE THE GAS FURNACE TO MAINTAIN THE DAT SETPOINT.

3. COOLING:

   IN COOLING MODE, THE ERU SHALL MODULATE ITS COMPRESSORS TO MAINTAIN THE DAT SETPOINT.

ENERGY RECOVERY WHEEL

1. ENERGY RECOVERY WHEEL SHALL BE CONTROLLED TO MAXIMIZE ENERGY TRANSFER FROM EXHAUST AIR TO SUPPLY AIR.

2. THE ERU CONTROLLER SHALL MONITOR THE ENTERING AND DISCHARGE SIDE OF BOTH THE SUPPLY AND EXHAUST AIR STREAMS FOR DRY BULB AND WET BULB TEMPERATURES.

3. THE ERU CONTROLLER SHALL INTERFACE WITH THE BAS FOR SETPOINT ADJUSTMENT, ALARM, TROUBLE, AND SENSOR VALUES.

4. BAS SHALL TREND ALL SENSED VALUES FOR ALL FOUR (4) AIR MONITORED POINTS BY TIME REFERENCE.

5. THE ENTHALPY WHEEL SHALL CONTINUE TO ROTATE DURING THE DEFROST CYCLE.

6. THE ENTHALPY WHEEL DEFROST CYCLE SHALL BE INITIATE WHEN:

   a. WHEN THE OUTSIDE AIR DRY BULB TEMPERATURE IS LOWER THAN THE EXHAUST AIR FROST DRY-BULB TEMPERATURE.

   b. IF THE EXHAUST AIR PRESSURE DROP ACROSS THE ENTHALPY RISES ABOVE SETPOINT.

   c. UPON ACTIVATION OF THE DEFROST CYCLE THE OUTSIDE AIR ENTHALPY WHEEL BYPASS DAMPER SHALL MODULATE OPEN. THE GAS HEATING SHALL BE STAGED TO MAINTAIN DISCHARGE AIR TEMPERATURE AND THE ENTHALPY WHEEL EXHAUST BYPASS DAMPER SHALL REMAIN CLOSED.

   d. THE SYSTEM SHALL REMAIN IN DEFROST CYCLE UNTIL THE ENTHALPY WHEEL PRESSURE DROP RETURNS TO ITS ORIGINAL SETPOINT.

LOSS OF POWER / FAILURE TO START

1. IN AN EVENT WHERE EITHER OF THE GUESTROOM ERUs (ERU-01 AND ERU-02), THE ERU IN QUESTION SHALL FOLLOW THE BELOW SEQUENCE:

   a. ERU OA AND RA DAMPERS SHALL FAIL CLOSE.

   b. CORRESPONDING EMERGENCY EXHAUST FAN(S) DAMPER SHALL OPEN.

   c. ONCE CORRESPONDING EMERGENCY EXHAUST FAN(S) DAMPER PROVES OPEN, FAN SHALL ENERGIZE.

1 VARIABLE VOLUME ENERGY RECOVERY UNIT W/ ENTHALPY WHEEL (ERV-H02 & ERV-H03) CONTROL SEQUENCE

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BULLETIN 08
05/12/2023

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REVISIONS

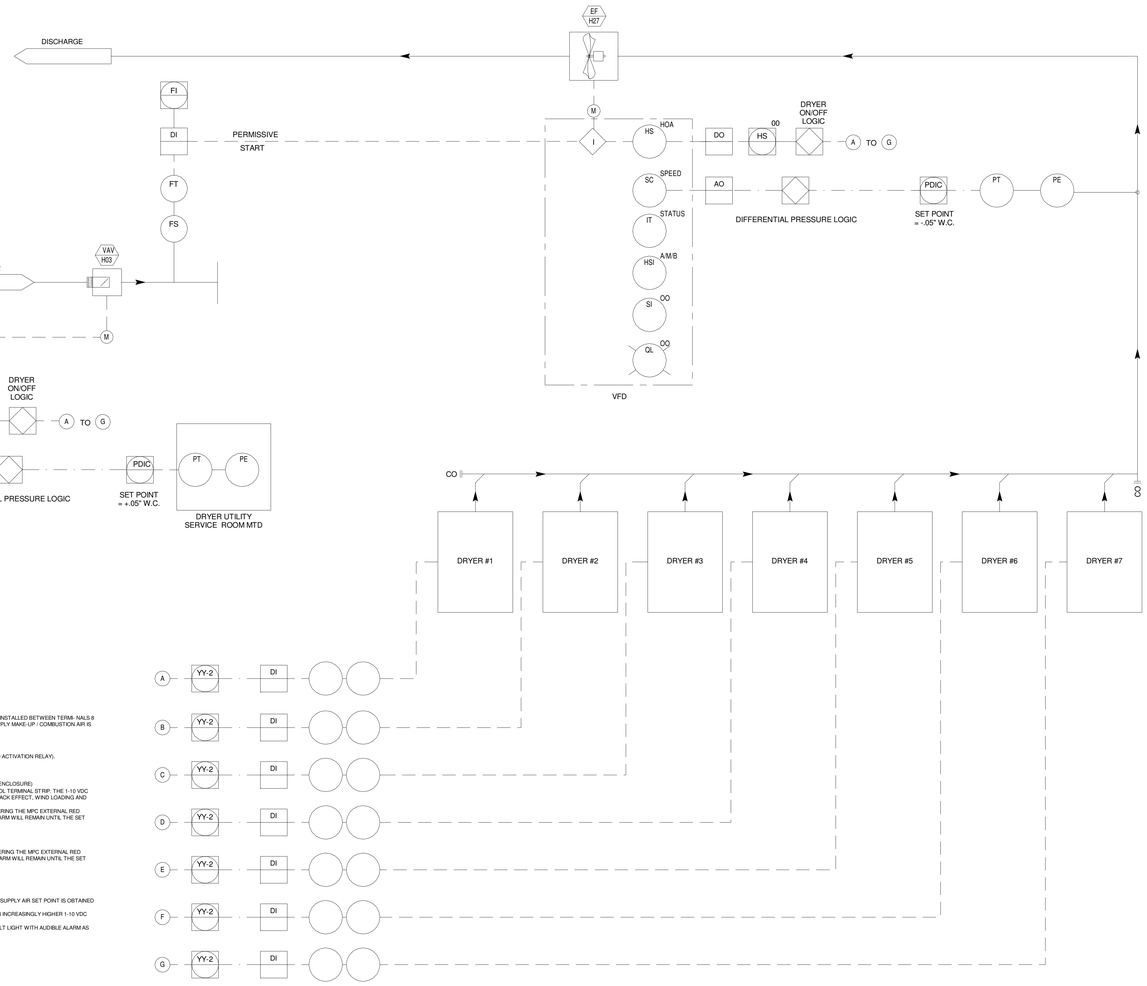
11 05/12/2023 BULLETIN 08

HVAC CONTROLS

M-812

5/12/2023 8:06:51 AM
DRAWING PRINTED FULL SIZE (18"X24") - IN HALF - DRAWING PRINTED HALF SIZE (12"X18") WILL FIT ON A SHEET 18"X24" WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES | DRAWING PRINTED HALF THEN SIZE (9"X12") = 11"X14.5"9" WILL FIT (TIGHTLY) ON A 11"x17" | INDIVIDUAL 2", 3", 4", 1.5", 1.75" AND 1.125" VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 6 AND MAKING THE NUMERATOR 12 | EXAMPLE 1.5/8"=1'-0" (1.5"X6) WILL BE 3/4"=1'-0" FOR SCALES AT 24", 36", 1/16" AND 1/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR/DOUBLE/ AND CHANGE THE NUMERATOR TO 1 | EXAMPLE 3/8"=1'-0" (3"X8) WILL BE 6"=1'-0" (0.75"X8)

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SUPPLY MAKE-UP / COMBUSTION AIR PRESSURE SET POINT

MPC CONTROLLERS ARE DEFAULTED TO A 0.10" W.C. SET POINT. TO ENABLE THE SET POINT 2, DEFAULT SETTING (0.00" W.C.) FOR SUPPLY MAKE-UP/COMBUSTION, A JUMPER WIRE MUST BE INSTALLED BETWEEN TERMI- NALS 8 & 9 ON THE RIGHT HAND SIDE OF THE PRESSURE CONTROL TERMINAL STRIP. REMOVE PRESSURE CONTROL COVER WITH SMALL PHILLIPS SCREWDRIVER TO ACCESS TERMINAL STRIP. SUPPLY MAKE-UP / COMBUSTION AIR IS PROVIDED BY VAV-H03.

MPC SEQUENCE OF OPERATION

1. WITH ANY EXTERNAL 120 VAC SUPPLY POWER SWITCH TO MPC ACTIVATED AND THE MPC INTERNAL POWER SWITCH ON, 120 VAC IS SUPPLIED TO:
2. THE MTR TERMINAL OF THE POWER TERMINAL BLOCK (CAN BE USED TO POWER 120 VAC INTAKE DAMPER MOTORS UP TO 5 AMPS OR ENERGIZE THE COIL OF A LINE VOLTAGE COIL VFD ACTIVATION RELAY).
3. SIMULTANEOUSLY IT ENERGIZES THE 24 VAC TRANSFORMER TO SUPPLY POWER TO: THE 24 VAC HOT OF THE EXTERNAL GREEN RUN LIGHT ON THE MPC COVER.

- TERMINAL 5 OF THE PRESSURE CONTROL TO POWER THE COMMON OF ITS N/O ALARM RELAY CONTACTS.
- THE 24 TERMINAL OF THE PRESSURE CONTROL TERMINAL BLOCK. (USED TO ENERGIZE TJERNLUND PRODUCTS VFDXXX MPC SERIES VFD ACTIVATION RELAY WITHIN VFD ELECTRICAL ENCLOSURE)
- TERMINAL 1 OF THE PRESSURE CONTROL, ACTIVATING IT TO MEASURE SYSTEM PRESSURE AND TO OUTPUT A PROPORTIONAL 1-10 VDC SIGNAL TO THE 1-10 TERMINAL OF THE CONTROL TERMINAL STRIP. THE 1-10 VDC SIGNAL FROM THE CONTROL TERMINAL STRIP IS WIRED DIRECTLY TO AN ECM MOTOR INPUT OR TO A VFD INPUT TO VARY THE FAN SPEED TO MAINTAIN THE SET POINT AS VOLUME, STACK EFFECT, WIND LOADING AND REFERENCE PRESSURE CHANGE.
- IF THE PRESSURE CONTROL MAK'S OUT THE OUTPUT (10 VDC) FOR GREATER THAN 10 SECONDS (FIELD ADJUSTABLE), THE PRESSURE CONTROL ALARM CIRCUIT WILL ACTIVATE, POWERING THE MPC EXTERNAL RED FAULT LIGHT WITH AUDIBLE ALARM AS WELL AS ANY EXTERNAL ALARM OR BMS THAT ARE WIRED TO THE ALARM CIRCUIT WHILE CONTINUING TO TRY TO MAKE THE SET POINT. THE ALARM WILL REMAIN UNTIL THE SET POINT IS REACHED OR POWER IS REMOVED FROM THE MPC CONTROLLER.

PRESSURE FAULT SEQUENCE

- IF THE PRESSURE CONTROL MAK'S OUT THE OUTPUT (10 VDC) FOR GREATER THAN 10 SECONDS (FIELD ADJUSTABLE), THE PRESSURE CONTROL ALARM CIRCUIT WILL ACTIVATE, POWERING THE MPC EXTERNAL RED FAULT LIGHT WITH AUDIBLE ALARM AS WELL AS ANY EXTERNAL ALARM OR BMS THAT ARE WIRED TO THE ALARM CIRCUIT WHILE CONTINUING TO TRY TO MAKE THE SET POINT. THE ALARM WILL REMAIN UNTIL THE SET POINT IS REACHED OR POWER IS REMOVED FROM THE MPC CONTROLLER.

MPC OPERATIONAL CONFIRMATION

- ESTABLISH 120 VAC SUPPLY POWER TO THE MPC AND SWITCH MPC INTERNAL POWER SWITCH TO THE ON POSITION.
- THE PRESSURE CONTROL SHOULD BECOME ENERGIZED AND OUTPUT A 1-10 VDC SIGNAL TO THE VFD OR ECM FAN MOTOR. VERIFY THAT A 0.10" W.C. FOR EXHAUST OR 0.00" W.C. FOR SUPPLY AIR SET POINT IS OBTAINED BY THE PRESSURE CONTROL.
- REMOVE THE TUBING FROM THE STAINLESS STEEL SAMPLING TUBE TO DISRUPT THE PNEUMATIC CONNECTION TO THE MPC. THE PRESSURE CONTROL WILL CONTINUE TO OUTPUT AN INCREASINGLY HIGHER 1-10 VDC SIGNAL TO MAKE THE SET POINT.
- WHEN THE OUTPUT REACHES 10 VDC A 10 SECOND DELAY WILL OCCUR AND THEN THE PRESSURE CONTROL ALARM CIRCUIT WILL ACTIVATE, POWERING THE MPC EXTERNAL RED FAULT LIGHT WITH AUDIBLE ALARM AS WELL AS ANY EXTERNAL ALARM OR BMS THAT ARE WIRED TO THE ALARM CIRCUIT.
- RECONNECT THE TUBING TO THE SAMPLING TUBE.
- THE SAFETY CIRCUIT WILL RESET WHEN THE PRESSURE SET POINT IS ONCE AGAIN ACHIEVED.

1 DRYER EXHAUST SEQUENCE OF OPERATIONS

Additions and Renovations to Harrah's Cherokee Valley River

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PERMIT SET
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NORTH CAROLINA PROFESSIONAL 039457 ENGINEER EDWARD DALTON
1/30/2023

ISSUE	12/22/2022
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DRAWN	MWM
SCALE	12" = 1'-0"
REVISIONS	

HVAC CONTROLS

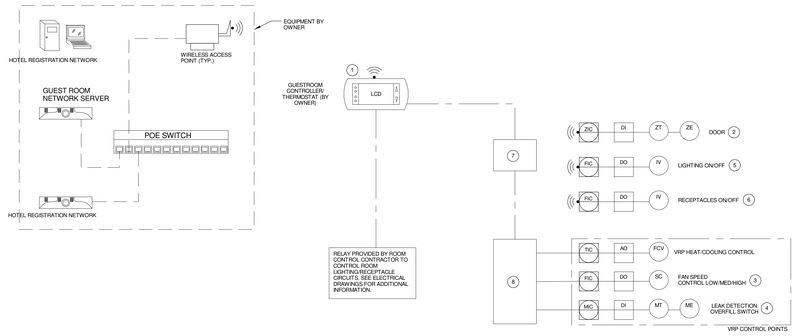
M-813

1/30/2023 11:22:11 AM DRAWING PRINTED FULL SIZE (30"H) - IF PLOT DRAWING PRINTED ON A2 SIZE (24"H), IT IS SHOWN AT HALF SCALE. IF PLOT DRAWING PRINTED ON A1 SIZE (24"H) IT IS SHOWN AT 3/4" SCALE. IF PLOT DRAWING PRINTED ON A0 SIZE (30"H) IT IS SHOWN AT FULL SCALE. IF NEITHER OF THESE SIZES ARE SHOWN, THE DRAWING HAS BEEN PRINTED AT AN UNKNOWN SCALE AND THE NUMERATOR IS 1 AND THE DENOMINATOR IS EQUIVALENT AND CHANGE THE NUMERATOR TO 1.5 WHEN 1/4"=1'-0" FOR SCALES AT 1/4" = 1'-0", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR

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KEY NOTES:

1. TYPICAL WIRELESS TELKONET MODULAR ROOM CONTROLLER/DIGITAL THERMOSTAT WITH ADJUSTABLE LCD SCREEN, INFRARED OCCUPANCY SENSOR, AND ROOM MONITORING AND CONTROL. THE CONTROLS CONTRACTOR SHALL PROVIDE POWER WIRING TO THE THERMOSTAT. EXACT LOCATION SHALL BE PER INTERIOR ARCHITECTURAL PLANS & ELEVATIONS.
2. WIRELESS DOOR OCCUPANCY STATUS.
3. DIGITAL FAN SPEED CONTROL OF ROOM VRP. PROVIDE ALL REQUIRED CONTACTS, EXPANSION BOARD AS REQUIRED.
4. MOISTURE ALARM-PROVIDE A LEAK DETECTION PUCK OR THE CODE REQUIRED DRAIN WATER FLOW SWITCH. WIRE DEVICE TO SHUT DOWN VRP.
5. THE LIGHTING WITHIN THE GUEST ROOM IS CONTROLLED THROUGH THE ROOM CONTROLLER BASED ON OCCUPANCY STATUS.
6. DUPLEX OUTLETS CONNECT TO ROOM OCCUPANCY SENSOR TO DISARM POWER TO DESIGNATED TV's, LAMPS, AND RECEPTACLES. REFER TO ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
7. NETWORK COMMUNICATION INTERFACE MODULE WIRED TO VRP UNIT BY CONTROLS CONTRACTOR.
8. VRP UNIT CONTROLLER.



2 TYPICAL GUEST ROOM HVAC CONTROL SCHEMATIC

THE SYSTEM SHALL BE DESIGNED AND SIZED TO MAINTAIN THE SPECIFIED SPACE CONDITIONS

A. SYSTEM STARTUP
1. **POWER IS TURNED ON OR THE SYSTEM IS RESTARTED**
2. **AFTER A SHORT INITIAL DELAY TO ALLOW THE SENSORS TO STABILIZE, THE BLOWER STARTS AND OPERATES CONTINUOUSLY**
3. **BASED ON SENSOR FEEDBACK, THE SYSTEM SHALL BEGIN OR RESUME OPERATION BASED ON THE SEQUENCE BELOW**

B. AIRSIDE CONFIGURATION
1. **THE SYSTEM CONTINUOUSLY DELIVERS THE SPECIFIED SUPPLY AIR VOLUME TO THE NATATORIUM**
2. **THE MINIMUM EXHAUST AIR VOLUME IS SET TO MEET THE ENGINEER'S SCHEDULE.**
3. **THE MINIMUM OUTDOOR AIR VOLUME IS SET TO MEET THE ENGINEER'S SCHEDULE.**

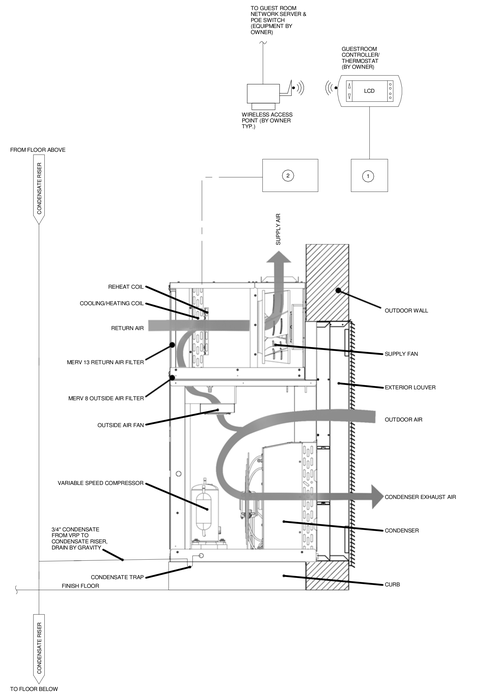
C. DEHUMIDIFICATION MODE
1. **THE RETURN AIR RELATIVE HUMIDITY IS ABOVE THE HUMIDITY SETPOINT**
2. **RETURN AIR DEWPOINT IS ABOVE DEWPOINT SETPOINT**
3. **THE COMPRESSOR ENTERS THE COMPRESSOR START SEQUENCE**
4. **INITIALLY, 100% OF COMPRESSOR HOT GAS DISCHARGE WILL BE DIVERTED TO CONDENSE AT THE AIR REHEAT COIL. THE SUPPLY AIR TEMPERATURE WILL BE HIGHER THAN THE RETURN AIR TEMPERATURE**

D. AIR CONDITIONING MODE
1. **THE RETURN AIR TEMPERATURE IS ABOVE THE ROOM TEMPERATURE SETPOINT**
2. **THE COMPRESSOR STARTS, IF NOT ALREADY OPERATING IN DEHUMIDIFICATION MODE**
3. **EXCESS COMPRESSOR HOT GAS IS DIVERTED TO A FLUID-COOLED BRAZED PLATE HEAT EXCHANGER. UP TO 100% OF COMPRESSOR HEAT IS REJECTED INTO THE GLYCOL FLUID LOOP WHICH IS PUMPED OUTDOORS TO AN OUTDOOR AIR-COOLED HEAT EXCHANGER FOR 100% HEAT REJECTION AT SUMMER DESIGN AMBIENT CONDITIONS**

E. SPACE HEATING MODE
1. **THE RETURN AIR TEMPERATURE IS BELOW THE ROOM TEMPERATURE SETPOINT**
2. **THE MICROPROCESSOR SPACE HEATING OUTPUT SIGNAL (0-10 VOLTS) IS SENT TO THE HEATING COIL CONTROLLER. THE SIGNAL OUTPUT WILL REGULATE BASED ON THE RETURN AIR TEMPERATURE**

F. FREEZE PROTECTION
1. **THE SUPPLY AIR TEMPERATURE FALLS BELOW THE FREEZESTAT SETPOINT**
2. **EXHAUST FAN(S) ARE STOPPED AND OUTDOOR AIR DAMPER(S) ARE FULLY CLOSED**
3. **WHEN THE FREEZESTAT ALARM IS TRIPPED, IT MUST BE MANUALLY CLEARED BY THE OPERATOR**

4 POOL DEHUMIDIFICATION AIR HANDLING UNIT (AHU-01) SEQUENCE OF OPERATIONS



1 TYPICAL GUESTROOM HVAC SEQUENCE OF OPERATIONS

GENERAL NOTES:

1. PROVIDE MOCK-UPS OF COMPLETE TYPICAL GUESTROOM HVAC CONTROL INSTALLATION FOR REVIEW AND APPROVAL PRIOR TO PROCEEDING WITH GUESTROOM HVAC CONTROLS WORK. MOCK-UP SHALL BE PROVIDED FOR EACH TYPICAL GUESTROOM DESIGNATED BY THE INTERIOR ARCHITECT.
2. REFER TO DRAWING MR-003 FOR MECHANICAL PLAN OF TYPICAL GUESTROOM.
3. THE CONTROLS CONTRACTOR SHALL INSTALL ALL GUESTROOM CONTROLS.

KEY NOTES:

1. COMMUNICATION INTERFACE MODULE WIRED TO VRF UNIT CONTROLLER BY CONTROLS CONTRACTOR. PROVIDES WIRELESS COMMUNICATION TO TELKONET THERMOSTAT.
2. VRF UNIT CONTROLLER.

SEQUENCE OF OPERATION FOR GUESTROOM VRF SYSTEMS:

COOLING SEQUENCE:
THE WALL THERMOSTAT PROVIDES THE TEMPERATURE SET POINT AS WELL AS THE CURRENT DRY BULB TEMPERATURE AND RELATIVE HUMIDITY. UPON A CALL FOR COOLING, THE COMPRESSOR MODULATES BASED ON THE DIFFERENCE BETWEEN ROOM TEMPERATURE AND SET POINT. AS COOLING DEMAND DECREASES THE COMPRESSOR WILL MODULATE TO A MINIMUM SPEED. IF THE ROOM TEMPERATURE DROPS (2) DEGREES BELOW SET POINT THE COMPRESSOR WILL CYCLE OFF.

HEATING SEQUENCE:
THE WALL THERMOSTAT PROVIDES THE TEMPERATURE SET POINT AS WELL AS THE CURRENT DRY BULB TEMPERATURE AND RELATIVE HUMIDITY. UPON A CALL FOR HEATING, THE COMPRESSOR MODULATES BASED ON THE DIFFERENCE BETWEEN ROOM TEMPERATURE AND SET POINT. AS HEATING DEMAND DECREASES THE COMPRESSOR WILL MODULATE TO A MINIMUM SPEED. IF THE ROOM TEMPERATURE RAISES (2) DEGREES ABOVE SET POINT THE COMPRESSOR WILL CYCLE OFF.

MAIN SUPPLY FAN SEQUENCE:
(SMART FAN) THE SUPPLY FAN CYCLES WITH THE COMPRESSOR. THE FAN WILL MODULATE BASED ON THE DIFFERENCE BETWEEN THE SPACE TEMPERATURE AND SPACE SET POINT.

IAQ VENTILATION FAN SEQUENCE:
(ON) THE FAN(S) RUNS AT ALL TIMES.

HOT GAS REHEAT COIL SEQUENCE:
THE HOT GAS REHEAT COIL IS OFF WHEN SPACE IS SATISFIED IF THE RELATIVE HUMIDITY OF THE SPACE IS ABOVE 55%, THE HOT GAS REHEAT COIL WILL BE ACTIVATED. THE HOT GAS REHEAT COIL WILL REMAIN ACTIVATED UNTIL THE RELATIVE HUMIDITY DROPS BELOW 50% OR IF THE ROOM TEMPERATURE CREEPS TOO FAR AWAY FROM SET POINT.

AUXILIARY ELECTRIC HEAT SEQUENCE:
AUXILIARY HEAT IS ACTIVATED ON A SLIDING SCALE BASED ON OUTDOOR AMBIENT TEMPERATURE AND THE DIFFERENCE BETWEEN SET POINT AND ROOM TEMPERATURE. DURING MILD AMBIENT CONDITIONS, THE LARGE DIFFERENCE BETWEEN SET POINT AND ACTUAL ROOM TEMPERATURE IS ACCEPTABLE. IN EXTREME LOW TEMPERATURES A SMALLER DIFFERENCE BETWEEN THE TWO ARE PERMITTED ENERGIZING THE AUXILIARY HEAT SOONER.

DEFROST:
THE ELECTRIC HEAT FOR THE VRF IS TO BE CONSIDERED 'BACK -UP' AND NOT 'SUPPLIMENTAL'. AT NO POINT IN TIME WILL THE PUMP AND ELECTRIC HEAT OPERATE SIMULTANEOUS NORMALLY, AND IN A VAST MAJORITY OF HEATING CONDITIONS, THE HEAT PUMP WILL BE THE PRIMARY SOURCE OF HEAT DOWN TO 0F). EVENTUALLY, THE OUTDOOR COIL MAY ACCUMULATE FROST AND THE UNIT WILL REQUIRE A DEFROST CYCLE. IF THE SPACE IS STILL 1 DEGREE FAHRENHEIT OR MORE BELOW SET POINT, THE VRF WILL CYCLE THE ELECTRIC HEAT ON AND OFF AS NEEDED TO MAINTAIN SET POINT. ONCE THE ROOM IS SATISFIED THE VRF WILL OPERATE THE BLOWER AND CONDENSER FANS AT THEIR LOWEST SPEEDS AND RUN THE COMPRESSOR IN THE COOLING CYCLE TO DEFROST THE OUTDOOR COIL. THE BLOWER FAN OPERATES TO HELP PREVENT THE INDOOR COIL FROM FREEZING DURING THIS PROCESS. ONCE THE OUTDOOR COIL RISES ABOVE 46 DEGREES FARENHEIT, THE DEFROST CYCLE WILL END AND THE UNIT WILL CONTINUE WITH NORMAL OPERATION BASED ON THE SPACE CONDITIONS AND SETTINGS.

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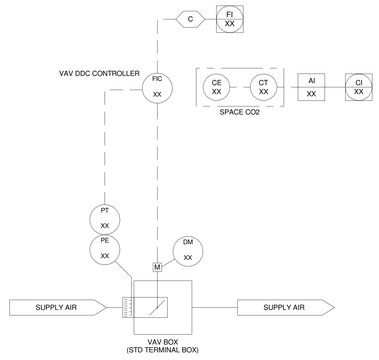
REVISIONS

HVAC CONTROLS

M-814

1/30/2023 11:22:14 AM (DRAWING PRINTED FULL SIZE (30"H) - IF PART (DRAWING PRINTED ANY SIZE LESS) WILL FIT ON A SHEET 36"X24" WITH 1/2" OF EXTRA SPACE ON ALL FOUR SIDES) DRAWING PRINTED NEARLY THIS SIZE (IF ALL 11'-0"H FIELDS FIT TIGHTLY ON 11'-0" INDIVIDUAL 12", 24", 36", 1/16" AND 1/32" WIDE SCALE FILL TRIANGLES FIT ALL SIDE THE DIMENSION BY 8 AND MARKING THE NUMBER ON 3, 1 OVER 3 LAMPS, 2, 1/8"=1'-0" (1/32"), WILL BE 3/4"=1'-0" FOR SCALES AT 24", 36", 1/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR/DOUBLE/ ARE CHANGE THE NUMERATOR TO 1, 3 OVER 8, 3/16"=1'-0" (3/16), WILL BE 3/4"=1'-0" (3/16) FILL BY 8 AND MARKING THE NUMERATOR TO 3, 1 OVER 4, 1/4"=1'-0" (1/4), WILL BE 3/4"=1'-0" (1/4) FILL BY 4 AND MARKING THE NUMERATOR TO 1, 1 OVER 2, 1/2"=1'-0" (1/2), WILL BE 3/4"=1'-0" (1/2) FILL BY 2 AND MARKING THE NUMERATOR TO 1, 3 OVER 4, 3/4"=1'-0" (3/4), WILL BE 3/4"=1'-0" (3/4) FILL BY 1 AND MARKING THE NUMERATOR TO 1, 1 OVER 1, 1"=1'-0" (1"), WILL BE 3/4"=1'-0" (1") FILL BY 3/4 AND MARKING THE NUMERATOR TO 3, 1 OVER 1 1/2, 1 1/2"=1'-0" (1 1/2"), WILL BE 3/4"=1'-0" (1 1/2") FILL BY 1/2 AND MARKING THE NUMERATOR TO 1, 2 OVER 1, 2"=1'-0" (2"), WILL BE 3/4"=1'-0" (2") FILL BY 3/8 AND MARKING THE NUMERATOR TO 3, 3 OVER 1, 3"=1'-0" (3"), WILL BE 3/4"=1'-0" (3") FILL BY 1/4 AND MARKING THE NUMERATOR TO 1, 4 OVER 1, 4"=1'-0" (4"), WILL BE 3/4"=1'-0" (4") FILL BY 3/16 AND MARKING THE NUMERATOR TO 3, 6 OVER 1, 6"=1'-0" (6"), WILL BE 3/4"=1'-0" (6") FILL BY 1/8 AND MARKING THE NUMERATOR TO 1, 8 OVER 1, 8"=1'-0" (8"), WILL BE 3/4"=1'-0" (8") FILL BY 1/16 AND MARKING THE NUMERATOR TO 3, 12 OVER 1, 12"=1'-0" (12"), WILL BE 3/4"=1'-0" (12") FILL BY 1/32 AND MARKING THE NUMERATOR TO 3

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TYPICAL SUPPLY VAV BOX (NO REHEAT)

VV (VARIABLE VOLUME) TYPE: (SEE SCHEDULES FOR APPLICABLE UNITS)

A. GENERAL

1. VARIABLE VOLUME BOXES SHALL BE CONTROLLED BY THE DDC SYSTEM.
2. BOXES SHALL HAVE SETPOINTS ADJUSTABLE FROM THE DDC SYSTEM.

B. OCCUPIED MODE

1. THE DAMPER SHALL BE OPENED TO MAINTAIN THE MAXIMUM OCCUPIED AIRFLOW SETPOINT.
2. CO2 VENTILATION CONTROL (SEE PLANS FOR APPLICABLE UNITS): THE BMS SHALL MEASURE THE AVERAGE SPACE CO2 LEVELS AND MODULATE THE DAMPER TO MAINTAIN A CO2 SETPOINT OF 750 PPM (ADJ.).

C. UNOCCUPIED MODE

1. THE DAMPER SHALL BE CLOSED TO THE UNOCCUPIED AIRFLOW SETPOINT.

CV (CONSTANT VOLUME) TYPE: (SEE SCHEDULES FOR APPLICABLE UNITS)

A. GENERAL

1. VAV BOXES SHALL BE CONTROLLED BY THE DDC SYSTEM.
2. BOXES SHALL HAVE SETPOINTS ADJUSTABLE FROM THE DDC SYSTEM.

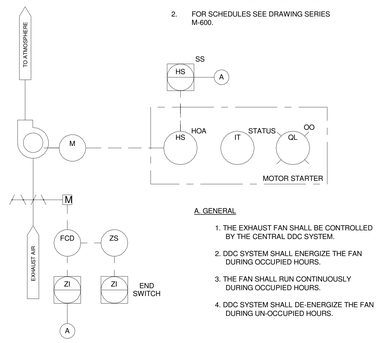
B. OCCUPIED OR UNOCCUPIED MODE

1. THE DAMPER SHALL BE OPEN AND MAINTAIN THE MAXIMUM OCCUPIED AIRFLOW SETPOINT. THIS AIRFLOW SHALL BE MAINTAINED 24/7 UNLESS THE ASSOCIATED AHU IS IN ALARM.

1 TYPICAL SUPPLY VAV BOX (NO REHEAT)
CONTROL DIAGRAM

GENERAL NOTES :

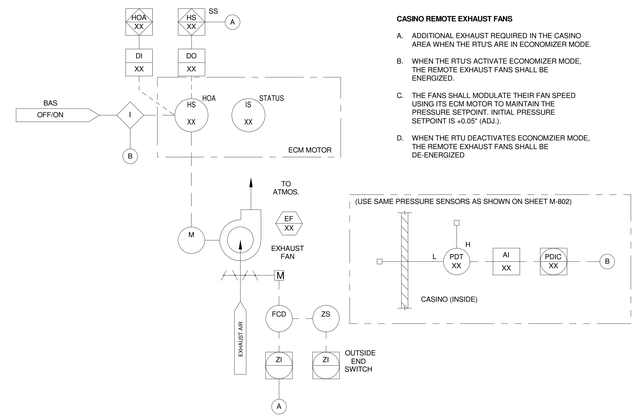
1. REFER TO DRAWING M-801 FOR INSTRUMENTATION SYMBOLS AND LEGEND.
2. FOR SCHEDULES SEE DRAWING SERIES M-600.



A. GENERAL

1. THE EXHAUST FAN SHALL BE CONTROLLED BY THE CENTRAL DDC SYSTEM.
2. DDC SYSTEM SHALL ENERGIZE THE FAN DURING OCCUPIED HOURS.
3. THE FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED HOURS.
4. DDC SYSTEM SHALL DE-ENERGIZE THE FAN DURING UN-OCCUPIED HOURS.

2 CASINO TOILET/JANITOR EXHAUST FAN
CONTROL DIAGRAM



CASINO REMOTE EXHAUST FANS

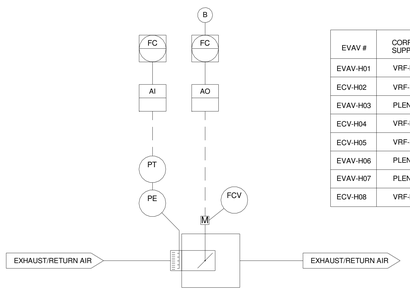
A. ADDITIONAL EXHAUST REQUIRED IN THE CASINO AREA WHEN THE RTU'S ARE IN ECONOMIZER MODE.

B. WHEN THE RTU'S ACTIVATE ECONOMIZER MODE, THE REMOTE EXHAUST FANS SHALL BE ENERGIZED.

C. THE FANS SHALL MODULATE THEIR FAN SPEED USING ITS ECM MOTOR TO MAINTAIN THE PRESSURE SETPOINT. INITIAL PRESSURE SETPOINT IS +0.05" (ADJ.).

D. WHEN THE RTU DEACTIVATES ECONOMIZER MODE, THE REMOTE EXHAUST FANS SHALL BE DE-ENERGIZED

3 CASINO REMOTE EXHAUST FANS (EF-C05 - EF-C08)
CONTROL DIAGRAM



EVAV #	CORRESPONDING SUPPLY VAV BOXES	DIFFERENTIAL
EVAV-H01	VRF-H06	10% (ADJ.)
ECV-H02	VRF-H04C & VRF-H08	10% (ADJ.)
EVAV-H03	PLENUM SPACE	7% (ADJ.)
ECV-H04	VRF-H15A & VRF-H15B	10% (ADJ.)
ECV-H05	VRF-H18 & VRF-H25	10% (ADJ.)
EVAV-H06	PLENUM SPACE	7% (ADJ.)
EVAV-H07	PLENUM SPACE	7% (ADJ.)
ECV-H08	VRF-H42	10% (ADJ.)

TYPICAL EXHAUST VAV BOX

VV (VARIABLE VOLUME) TYPE: (SEE SCHEDULES FOR APPLICABLE UNITS)

A. GENERAL

1. VARIABLE VOLUME BOXES SHALL BE CONTROLLED BY THE DDC SYSTEM.
2. BOXES SHALL HAVE SETPOINTS ADJUSTABLE FROM THE DDC SYSTEM.

B. OCCUPIED MODE

1. THE EXHAUST AIR FLOW SHALL TRACK THE SUPPLY AIRFLOW BY THE PRESET DIFFERENTIAL AS OUTLINED IN THE ADJACENT TABLE.

C. UNOCCUPIED MODE

1. THE DAMPER SHALL BE CLOSED TO THE UNOCCUPIED AIRFLOW SETPOINT.

CV (CONSTANT VOLUME) TYPE: (SEE SCHEDULES FOR APPLICABLE UNITS)

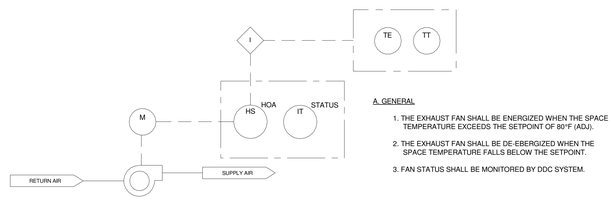
A. GENERAL

1. VAV BOXES SHALL BE CONTROLLED BY THE DDC SYSTEM.
2. BOXES SHALL HAVE SETPOINTS ADJUSTABLE FROM THE DDC SYSTEM.

B. OCCUPIED OR UNOCCUPIED MODE

1. THE DAMPER SHALL BE OPEN AND MAINTAIN THE MAXIMUM OCCUPIED AIRFLOW SETPOINT. THIS AIRFLOW SHALL BE MAINTAINED 24/7 UNLESS THE ASSOCIATED AHU IS IN ALARM.

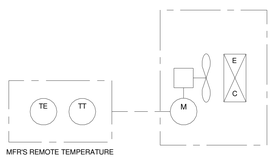
4 TYPICAL EXHAUST VAV BOX
CONTROL DIAGRAM



A. GENERAL

1. THE EXHAUST FAN SHALL BE ENERGIZED WHEN THE SPACE TEMPERATURE EXCEEDS THE SETPOINT OF 80°F (ADJ).
2. THE EXHAUST FAN SHALL BE DE-EBERGIZED WHEN THE SPACE TEMPERATURE FALLS BELOW THE SETPOINT.
3. FAN STATUS SHALL BE MONITORED BY DDC SYSTEM.

5 CASINO VESTIBULE SUPPLY FAN
CONTROL DIAGRAM



SEQUENCE OF OPERATIONS

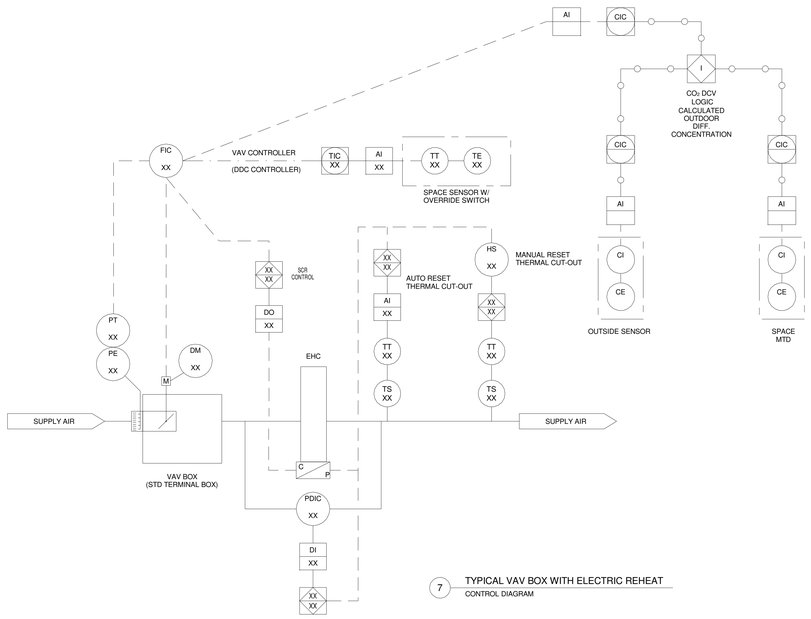
A. GENERAL

1. ELECTRIC UNIT HEATERS ARE STANDALONE AND SHALL NOT CONNECT TO BUILDING BMS SYSTEM.

B. OPERATION

1. UPON A DROP BELOW SPACE TEMPERATURE SETPOINT, 60°F (ADJ.), THE ELECTRIC HEATING COIL AND FAN SHALL BE ENERGIZED TO MAINTAIN HEATING SETPOINT. UPON A RISE IN SPACE TEMPERATURE ABOVE SETPOINT, THE REVERSE SHALL OCCUR.

6 ELECTRIC UNIT HEATER
CONTROL DIAGRAM



VAV BOX WITH ELECTRIC REHEAT

A. GENERAL

1. VARIABLE VOLUME BOXES SHALL BE CONTROLLED BY THE DDC SYSTEM.
2. BOXES SHALL HAVE SETPOINTS ADJUSTABLE FROM THE DDC SYSTEM.
3. TEMPERATURE SETTINGS SHALL BE AS FOLLOWS:

   A) OCCUPIED MODE
   COOLING SETPOINT: 75 DEG F (ADJ)
   HEATING SETPOINT: 70 DEG F (ADJ)

   B) UN-OCCUPIED MODE
   HEATING SETPOINT: 60 DEG F (ADJ)

B. OCCUPIED MODE

1. WHEN THE AIR HANDLING UNIT SERVING THE ASSOCIATED BOXES ON THAT SYSTEM IS ENERGIZED, BOXES ON THAT SYSTEM SHALL BE ACTIVE.
2. PRIMARY AIR DAMPER SHALL MODULATE BETWEEN MINIMUM AND MAXIMUM SETTINGS TO MAINTAIN SETPOINT.
3. WHEN THE PRIMARY AIR DAMPER HAS MODULATED TO ITS MINIMUM POSITION AND THE TEMPERATURE DROPS BELOW THE SETPOINT, THE DDC SYSTEM SHALL MODULATE THE HEATING COIL MAINTAIN THE TEMPERATURE SETPOINT.
4. AS THE ROOM TEMPERATURE INCREASES ABOVE ITS SETPOINT, THE PRIMARY AIR DAMPER SHALL MODULATE THE COLD AIRFLOW FROM THE LOWER MINIMUM TO THE MAXIMUM SETTING.

C. CO2 MONITORING (SEE FLOOR PLANS FOR APPLICABLE UNITS)

1. WHENEVER THE CO2 SENSOR SENSES A CO2 CONCENTRATION OF 1,000 PPM (ADJ.) (OR 600 PPM ABOVE TO OUTDOORS)(ADJ.), AFTER A 5 MIN.TIME DELAY (ADJ.), THE PRIMARY AIR DAMPER SHALL MODULATE THE AIRFLOW FROM ITS CURRENT SETTING TOWARDS THE MAXIMUM SETTING, AS THE CO2 CONCENTRATION DROPS BELOW SETPOINT, THE REVERSE SHALL OCCUR. THE HEATING COIL CONTROL VALE SHALL BE MODULATE AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SETPOINT.
2. CO2 CONTROL SHALL OVERRIDE THE SPACE TEMPERATURE SEQUENCE, THUS AS THE CO2 VENTILATION REQUIREMENTS MORE PRIMARY VENTILATION AIR AND THE SPACE DROPS BELOW THE OCCUPIED SET-POINT, THE DDC SYSTEM SHALL INITIALIZE THE HEATING SEQUENCE TO MAINTAIN SPACE SET-POINTS.

7 TYPICAL VAV BOX WITH ELECTRIC REHEAT
CONTROL DIAGRAM

Additions and Renovations to Harrah's Cherokee Valley River

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1/30/2023

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HVAC CONTROLS

M-815

1/30/2023 11:22:17 AM
DRAWING PRINTED FULL SIZE (30"X42") - DEFAULT DRAWING PRINTED HALF SIZE (15X21) (IF ON A SHEET 'B' PLOT WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES.) DRAWING PRINTED HALF SIZE (15"X21") - 1:1 (FOR SCALE AT 24": 3/8" AND 1/32" VIEW SCALE) WILL THROUGH BY MISLETTING ON THE DENOMINATOR BY AND MAKING THE NUMERATOR 1 FOR EXAMPLE 1/8"=1'-0" (IF 3/16") WILL BE 3/4"=1'-0" FOR SCALE AT 24": 3/16" AND 1/32" VIEW SCALE) WILL THROUGH BY MISLETTING ON THE DENOMINATOR BY AND MAKING THE NUMERATOR 3 FOR EXAMPLE 3/16"=1'-0" (IF 3/16") WILL BE 9/16"=1'-0" FOR SCALE AT 24": 3/16" AND 1/32" VIEW SCALE) WILL THROUGH BY MISLETTING ON THE DENOMINATOR BY AND MAKING THE NUMERATOR 3 FOR EXAMPLE 3/16"=1'-0" (IF 3/16") WILL BE 9/16"=1'-0"

790

SEQUENCE OF OPERATION:

DX UNIT WITH HUMIDIFCATION AND REHEAT

A. GENERAL

1. BMS SHALL MONITOR OPERATING PARAMETERS OF THE UNIT THROUGH A BACNET LINK INTERFACE WITH THE CRAC UNIT DIGITAL CONTROLLER.

B. SETPOINTS:

a. ROOM TEMP SETPOINT: 70°F W/ 2.5°F DEADBAND (ADJ.), 45% RH (ADJ.)

C. DX SPLIT UNIT WITH HUMIDIFICATION AND REHEAT:

1. STAGING AND CONTROL STRATEGY: THE UNIT OPERATION SHALL BE STAGED (ENABLE/DISABLED) BY THE BMS TO ALLOW THE UNITS CONTROLLER TO MAINTAIN THE SPACE TEMPERATURE AND HUMIDITY. IF THE SPACE TEMPERATURE SETPOINT IS SATISFIED AND THE SPACE HUMIDITY EXCEEDS THE SETPOINT ACTIVATE THE REHEAT COIL.
2. TEMPERATURE CONTROL: THE BMS SHALL MONITOR THE ROOM TEMPERATURE SENSOR AND HUMIDITY.

D. SPACE HUMIDIFICATION

1. HUMIDIFICATION FOR THE ROOM SHALL BE PROVIDED BY THE HUMIDIFIER PROVIDED WITH THE UNIT.

E. LEAK DETECTION SYSTEM:

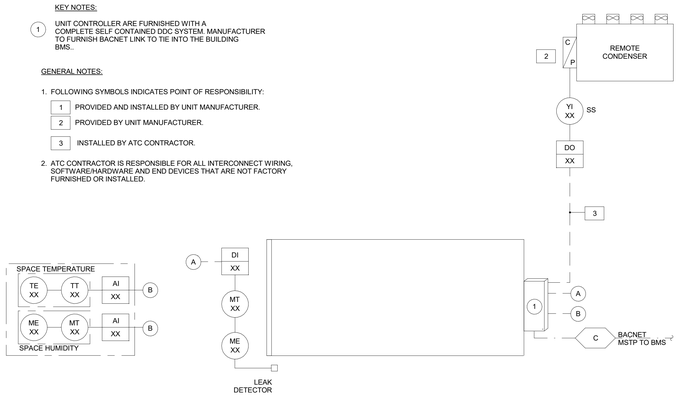
1. THE DUAL FLOAT CONDENSATE PUMP SHALL SHUT DOWN THE UNIT WHEN WATER IS DETECTED.

KEY NOTES:

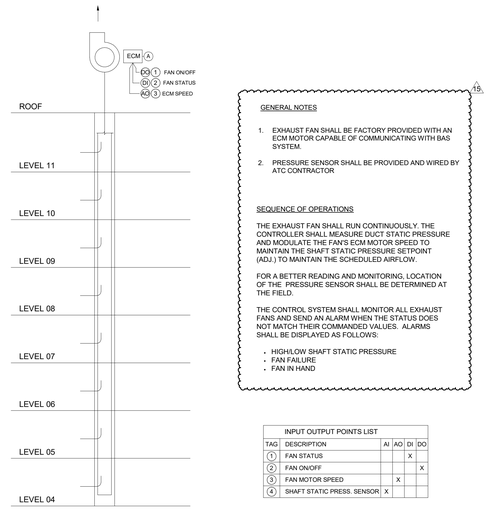
1 UNIT CONTROLLER ARE FURNISHED WITH A COMPLETE SELF CONTAINED DDC SYSTEM. MANUFACTURER TO FURNISH BACNET LINK TO TIE INTO THE BUILDING BMS..

GENERAL NOTES:

1. FOLLOWING SYMBOLS INDICATES POINT OF RESPONSIBILITY:
   - 1 PROVIDED AND INSTALLED BY UNIT MANUFACTURER.
   - 2 PROVIDED BY UNIT MANUFACTURER.
   - 3 INSTALLED BY ATC CONTRACTOR.
2. ATC CONTRACTOR IS RESPONSIBLE FOR ALL INTERCONNECT WIRING, SOFTWARE/HARDWARE AND END DEVICES THAT ARE NOT FACTORY FURNISHED OR INSTALLED.



1 CARD/STORAGE DX SPLIT UNIT
CONTROL DIAGRAM



GENERAL NOTES

1. EXHAUST FAN SHALL BE FACTORY PROVIDED WITH AN ECM MOTOR CAPABLE OF COMMUNICATING WITH BAS SYSTEM.
2. PRESSURE SENSOR SHALL BE PROVIDED AND WIRED BY ATC CONTRACTOR

SEQUENCE OF OPERATIONS

THE EXHAUST FAN SHALL RUN CONTINUOUSLY. THE CONTROLLER SHALL MEASURE DUCT STATIC PRESSURE AND MODULATE THE FAN'S ECM MOTOR SPEED TO MAINTAIN THE SHAFT STATIC PRESSURE SETPOINT (ADJ.) TO MAINTAIN THE SCHEDULED AIRFLOW.

FOR A BETTER READING AND MONITORING, LOCATION OF THE PRESSURE SENSOR SHALL BE DETERMINED AT THE FIELD.

THE CONTROL SYSTEM SHALL MONITOR ALL EXHAUST FANS AND SEND AN ALARM WHEN THE STATUS DOES NOT MATCH THEIR COMMANDED VALUES. ALARMS SHALL BE DISPLAYED AS FOLLOWS:

- HIGH/LOW SHAFT STATIC PRESSURE
- FAN FAILURE
- FAN IN HAND

INPUT OUTPUT POINTS LIST

TAG	DESCRIPTION	AI	AO	DI	DO
1	FAN STATUS			X	
2	FAN ON/OFF				X
3	FAN MOTOR SPEED		X		
4	SHAFT STATIC PRESS. SENSOR	X			

2 GUESTROOM BATHROOM RISER EXHAUST FANS
CONTROL DIAGRAM

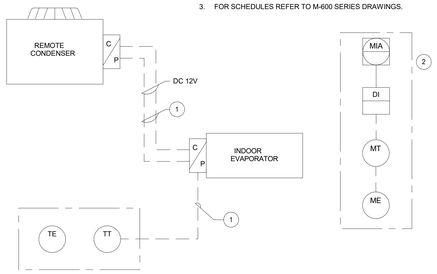
GENERAL NOTES :

1. REFER TO SEQUENCE OF OPERATIONS.
2. REFER TO DRAWING M-801 FOR INSTRUMENTATION SYMBOLS AND LEGEND.
3. FOR SCHEDULES REFER TO M-600 SERIES DRAWINGS.

KEY NOTES :

1 ALL INTERCONNECTING WIRING BETWEEN INDOOR AND OUTDOOR UNITS BY CONTROLS CONTRACTOR.

2 PROVIDE LEAK DETECTION FOR FAN COIL UNIT DRAIN PAN/CONDENSATE PUMP OVERFLOW.



SEQUENCE OF OPERATION

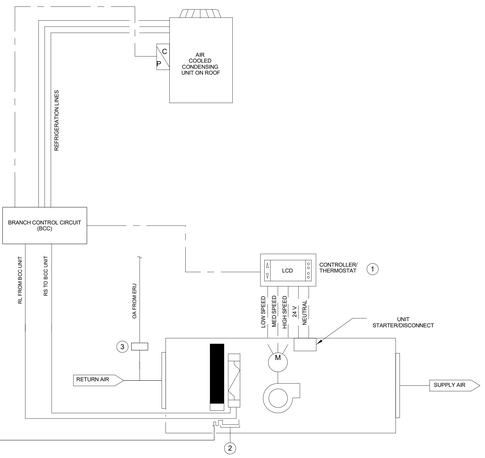
A. GENERAL

1. BMS SHALL MONITOR SPACE AND ALARM OUT OF RANGE CONDITIONS.
2. ACCU SHALL BE CONTROLLED BY THE PACKAGED CONTROL SYSTEM PROVIDED BY THE AC UNIT MANUFACTURER. THE OVERALL SYSTEMS CONTROLLER SHALL MONITOR THE SPACE OVERALL OPERATION.
3. ALL SETPOINTS SHALL BE ADJUSTABLE FROM THE BMS SYSTEM.
4. SYSTEM SHALL OPERATE 24/7.
5. TEMPERATURE SETTINGS SHALL BE AS FOLLOWS:
   a. OCCUPIED MODE COOLING SETPOINT: 75°F (ADJ)
6. ATC CONTRACTOR IS RESPONSIBLE FOR ALL INTERCONNECTING CONTROL WIRING BETWEEN THE EVAPORATOR UNIT, CONDENSING UNIT AND REMOTE SPACE MOUNTED DEVICES.

B. STAND-BY (GENERATOR) POWER MODE

1. EQUIPMENT AND ALL BAS COMPONENTS SHALL BE OPERATIONAL ON STANDBY POWER, SEE SCHEDULES FOR EQUIPMENT REQUIRED TO BE ON STAND-BY POWER.

3 TYPICAL DUCTLESS SPLIT DX SYSTEM (FCU/CU)
CONTROL DIAGRAM



4 TYPICAL VRF SYSTEM
CONTROL DIAGRAM

GENERAL NOTES:

1. PROVIDE MOCK-UPS OF COMPLETE VRF CONTROL INSTALLATION FOR REVIEW AND APPROVAL.
2. REFER TO DWG M-801 FOR INSTRUMENTATION SYMBOLS AND LEGEND.
3. FOLLOWING SYMBOLS INDICATES POINT OF RESPONSIBILITY:
   - 1 PROVIDED AND INSTALLED BY UNIT MANUFACTURER.
   - 2 PROVIDED BY UNIT MANUFACTURER, INSTALLED BY CONTRACTOR.
   - 3 BY LSS/FIRE ALARM CONTRACTOR.
4. FOR SCHEDULES SEE DRAWING SERIES M-600.
5. THE CONTROLS CONTRACTOR SHALL INSTALL ALL BOH CONTROLS. CONTROLS CONTRACTOR IS RESPONSIBLE FOR ALL INTERCONNECTING WIRING BETWEEN OUTDOOR UNIT AND INDOOR UNITS, INCLUDING BCC UNITS.

KEY NOTES:

1 VRF UNIT CONTROLLER/PROGRAMMABLE LCD THERMOSTAT AND LEAK DETECTION. THE CONTROLLER/THERMOSTAT SHALL BE PROGRAMMED SCHEDULING FOR OCCUPIED AND UNOCCUPIED HOURS THROUGH THE NETWORK CONTROLLER/OPERATORS WORKSTATION.

2 PROVIDE WATER DETECTION SWITCH AND HARD WIRE TO UNIT STARTER. DETECTION OF WATER SHALL DE-ENERGIZE UNIT & CLOSE REFRIGERATION VALVE.

3 CONSTANT AIRFLOW REGULATOR. SEE SCHEDULES FOR DETAILS.

SEQUENCE OF OPERATION FOR VRF SYSTEMS:

INDOOR UNIT SEQUENCE OF OPERATIONS:

A. ON/OFF CONTROL: THE INDOOR UNITS WILL BE COMMANDED ON/OFF AT THE REMOTE CONTROLLER. IF ALL INDOOR UNITS ARE OFF, THE OUTDOOR UNIT SHALL TURN OFF. WITH THE NIGHT SETBACK FUNCTION/MODE, THE SYSTEM SHALL CYCLE ON DURING UNOCCUPIED PERIODS AS NEEDED TO MAINTAIN UNOCCUPIED TEMPERATURE SET POINT. THE CONTROLLER/THERMOSTAT SHALL BE SCHEDULED THROUGH THE CENTRAL NETWORK CONTROLLER/OPERATORS WORKSTATION FOR TEMPERATURE SET-POINTS AND OCCUPIED/UNOCCUPIED MODES WITH OVERRIDES.

B. SPACE TEMPERATURE CONTROL: THE INDOOR UNIT SHALL MODULATE ITS INTERNAL LINEAR EXPANSION VALVE (LEV) TO MAINTAIN THE TEMPERATURE SET POINT VIA THE INDOOR UNIT'S INTERNAL CONTROLS.

1. THE SET POINT IS ADJUSTABLE AT THE REMOTE CONTROLLER, CENTRAL CONTROLLER, OR THROUGH A BMS INTERFACE. THE TEMPERATURE SET POINT CAN ALSO BE SCHEDULED AT THE REMOTE CONTROLLER OR THE CENTRAL CONTROLLER.

C. MODE CONTROL:

1. AUTO MODE:
   a. THE INDOOR UNIT SHALL DETERMINE WHETHER IT SHOULD BE IN AUTO-HEAT MODE OR AUTO-COOL MODE BASED ON SPACE TEMPERATURE RELATIVE TO TEMPERATURE SET POINT. IF THE INDOOR UNIT IS IN AUTO HEAT MODE, THE INDOOR UNIT CONTROL BOARD SHALL FOLLOW THE HEAT MODE SEQUENCE. IF THE INDOOR UNIT IS IN AUTO COOL MODE, THE INDOOR UNIT CONTROL BOARD SHALL FOLLOW THE COOL MODE SEQUENCE.
2. HEATING MODE: THE INDOOR UNIT SHALL MODULATE ITS LINEAR EXPANSION VALVE (LEV) TO MAINTAIN TEMPERATURE SET POINT.
3. COOLING MODE: THE INDOOR UNIT SHALL MODULATE ITS LINEAR EXPANSION VALVE (LEV) TO MAINTAIN TEMPERATURE SET POINT.

b. ALARM:

1. PROVIDE HIGH/LOW SPACE TEMPERATURE ALARM 5 DEGREES ABOVE/BELOW SET-POINT
2. PROVIDE A COMMON FAULT ALARM POINT
3. COOLING COIL DRAIN OVERFILL ALARM.

SEQUENCE OF OPERATION:

CRAC UNIT

A. GENERAL

1. CRAC UNITS SHALL BE UTILIZED TO PROVIDE TEMPERATURE CONTROL OF COMPUTER ROOM.
2. CRAC UNIT IS PACKAGED COMPUTER ROOM UP-FLOW AIR HANDLING UNITS USING AIR-COOLED CONDENSER FOR HEAT REJECTION AND ECONOMIZER FOR FREE COOLING.
3. BMS SHALL MONITOR OPERATING PARAMETERS OF THE UNIT THROUGH A BACNET LINK INTERFACE WITH THE CRAC UNIT DIGITAL CONTROLLER.
4. BMS CRAC UNIT START/STOP CONTROL, RUNNING STATUS AND ALARMS MONITORING SHALL BE PERFORMED THROUGH BACNET INTERFACE WITH THE CRAC UNIT DIGITAL CONTROLLER.

B. SETPOINTS:

a. ROOM TEMP SETPOINT: 75°F W/ 2.5°F DEADBAND (ADJ.).

b. CRAC SUPPLY AIR SETPOINT: 65°F (ADJ.).

c. CRAC SUPPLY AIR TEMP ALARM: 80°F (ADJ.).

C. COMPUTER ROOM COOLING UNIT:

1. STAGING AND CONTROL STRATEGY: THE CRAC UNIT OPERATION SHALL BE STAGED (ENABLE/DISABLED) BY THE BMS TO ALLOW THE UNITS CONTROLLER TO MAINTAIN DISCHARGE AIR TEMPERATURE.
2. TEMPERATURE CONTROL: THE BMS SHALL MONITOR THE ROOM TEMPERATURE SENSOR AND HUMIDITY.

D. BMS CRAC UNIT ALARMING:

1. BMS CRAC UNIT ALARMING SHALL BE PERFORMED THROUGH THE BACNET INTERFACE.
2. THE BMS SHALL ASSESS THE FAN FAILURE AS UNIT FAILURE AND SHALL REQUIRE A MANUAL RESET BY THE OPERATOR.
3. CRAC WILL BE CONFIGURED TO INITIATE THE HARD WIRED ALARMS ONLY WHEN THERE IS A SMOKE INDICATION OR A FAN FAILURE.LOSS OF POWER:
4. ON LOSS OF UTILITY POWER THE CRAC SHALL OPERATE UNDER BACKUP POWER BY AN EMERGENCY GENERATOR.
5. A BMS NOTIFICATION ALARM SHALL BE GENERATED FOR THE LOSS OF POWER EVENT AT THE HMI.
6. EMERGENCY-ALL-ON: THE BMS SHALL START ALL CRAC UNIT AFTER ACOMPLETE(BOTH SOURCES OFF) LOSS OF POWER.

E. SPACE HUMIDIFICATION

1. HUMIDIFICATION FOR THE ROOM SHALL BE PROVIDED BY THE HUMIDIFIER PROVIDED WITH THE UNIT.

F. LEAK DETECTION SYSTEM:

1. THE LEAK DETECTION SYSTEM CONSISTS OF POINT LEAK DETECTION SYSTEM (PROVIDED BY LIEBERT) AND CABLE LEAK DETECTION (PROVIDED BY PERMALERT OR APPROVED EQUAL.

G. SMOKE SHUTDOWN

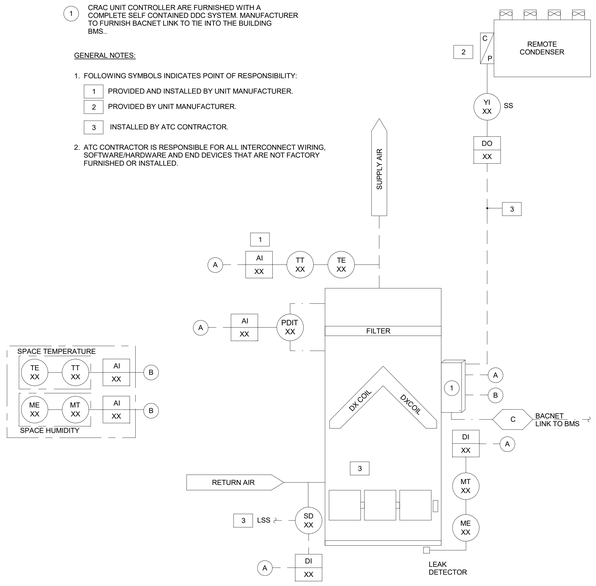
1. THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM AT THE BMS UPON RECEIVING A SMOKE DETECTOR STATUS.

KEY NOTES:

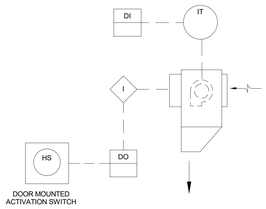
1 CRAC UNIT CONTROLLER ARE FURNISHED WITH A COMPLETE SELF CONTAINED DDC SYSTEM. MANUFACTURER TO FURNISH BACNET LINK TO TIE INTO THE BUILDING BMS..

GENERAL NOTES:

1. FOLLOWING SYMBOLS INDICATES POINT OF RESPONSIBILITY:
   - 1 PROVIDED AND INSTALLED BY UNIT MANUFACTURER.
   - 2 PROVIDED BY UNIT MANUFACTURER.
   - 3 INSTALLED BY ATC CONTRACTOR.
2. ATC CONTRACTOR IS RESPONSIBLE FOR ALL INTERCONNECT WIRING, SOFTWARE/HARDWARE AND END DEVICES THAT ARE NOT FACTORY FURNISHED OR INSTALLED.



3 MDF ROOM (CRAC) UNIT
CONTROL DIAGRAM



SEQUENCE OF OPERATIONS

GENERAL

1. AIR CURTAIN CONTROL PANEL PROVIDED BY MANUFACTURER.
2. DOOR SWITCH SHALL BE PROVIDED BY AIR CURTAIN MANUFACTURER.
3. ATC SHALL FIELD MOUNT CONTROL PANEL AND DOOR LIMIT SWITCH.

NORMAL OPERATION

1. THE SUPPLY FAN SHALL NORMALLY BE DE-ENERGIZED AND CONTROL VALVES CLOSED.
2. UPON THE OPENING OF THE LOADING DOCK DOOR, AS SENSED BY THE DOOR SWITCH, THE SUPPLY FAN SHALL ACTIVATE, AND RUN CONTINUOUSLY UNTIL THE LOADING DOCK DOOR IS CLOSED.

5 AIT CURTAIN
CONTROL DIAGRAM

Additions and Renovations to Harrah's Cherokee Valley River

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06/28/2023

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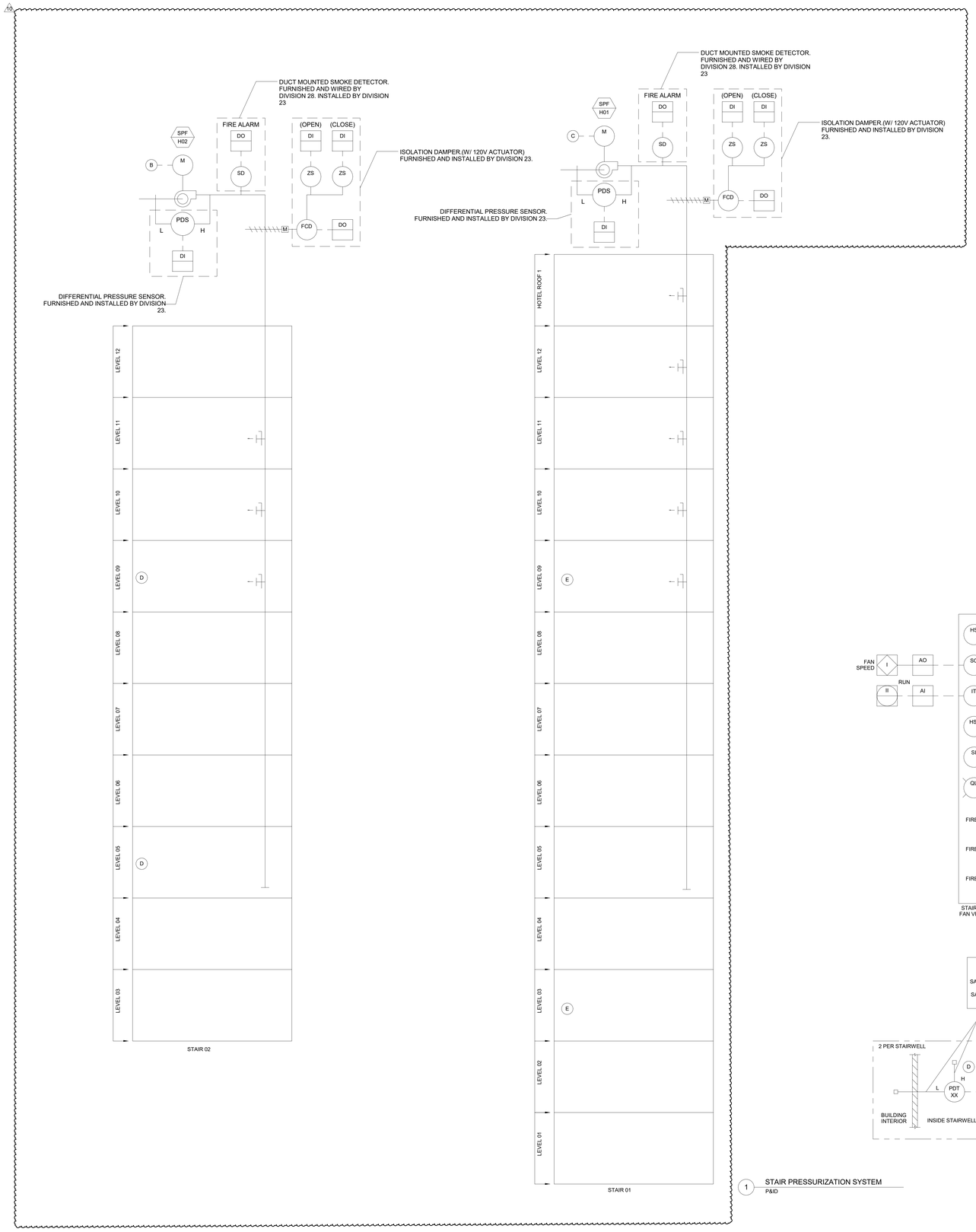
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HVAC CONTROLS

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1 STAIR PRESSURIZATION SYSTEM
P&ID

SEQUENCE OF OPERATION

A. GENERAL

1. REQUIREMENTS OF "SEQUENCE OF OPERATION-GENERAL" ON M-801 APPLY TO ALL SEQUENCES.
2. THE SYSTEM IS COMPRISED OF VARIABLE SPEED SUPPLY FANS WITH VFDS AND DISCHARGE ISOLATION DAMPERS.
3. THE ATC CONTRACTOR SHALL COORDINATE WITH THE FIRE ALARM SYSTEM IN ORDER TO PROVIDE THE REQUIRED CONTROL, MONITORING, AND ALARM POINTS.
4. THE SYSTEM SHALL BE AVAILABLE TO OPERATE 24/7 WITH FANS AND ALL CONTROL COMPONENTS ON STANDBY POWER.
5. THE SYSTEM SHALL BE CONNECTED TO THE FIREFIGHTER SMOKE CONTROL PANEL FOR MONITORING AND MANUAL OPERATION PURPOSES. (SEE SMOKE CONTROL PANEL CONTROL FOR MORE DETAILS)
6. THE FANS DISCONNECT SWITCH POSITION SHALL BE MONITORED BY THE FIRE ALARM SYSTEM. WHEN THE DISCONNECT SWITCH IS OUT OF NORMAL POSITION AN AMBER LIGHT ON THE FIREFIGHTERS SMOKE CONTROL PANEL.

B. SAFETIES

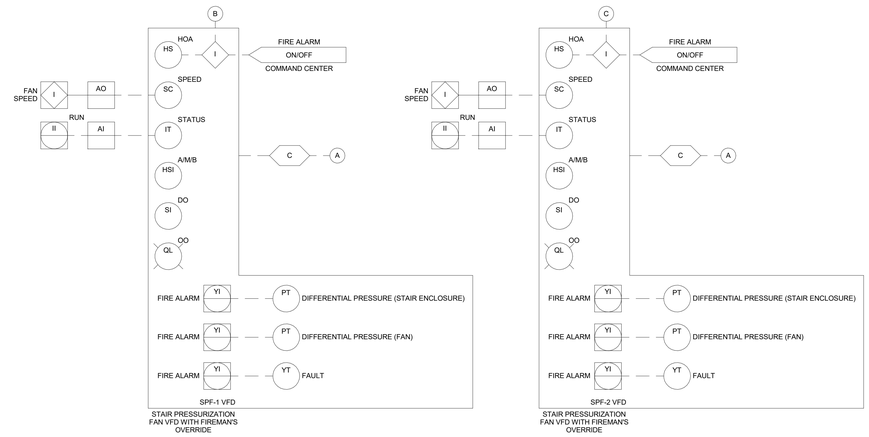
1. THE FOLLOWING SAFETIES, EACH WITH ITS OWN MANUAL RESET SHALL SHUTDOWN THE FAN AND INITIATE A SPECIFIED ALARM TO THE FA SYSTEM:
   a. IF THE SUPPLY SMOKE DETECTOR TRIPS, THE SUPPLY FAN SHALL BE SHUTDOWN BY THE FA SYSTEM, THE UNIT SHALL BE DEACTIVATED AND AN ALARM GENERATED TO THE FA SYSTEM.

C. ALARMS

1. THE FA SYSTEM SHALL INITIATE AN ALARM DESCRIBING THE ALARM IF ANY OF THE FOLLOWING CONDITIONS ARE MEET.
   a. DAMPER END SWITCH INDICATES DAMPER IS NOT IN COMMAND POSITION 3 MINUTES (ADJ.) AFTER COMMANDED TO DO SO.
   b. FAN DIFFERENTIAL PRESSURE SWITCH INDICATES NO/LOW FLOW ACROSS THE FAN 3 MINUTES (ADJ) AFTER THE FAN IS COMMANDED TO RUN.
   c. IF THE FANS VFD INTERNAL DIAGNOSTICS INDICATES A FAULT

D. PRESSURIZATION FAN CONTROL

1. UPON A SIGNAL FROM THE FIRE ALARM SYSTEM INDICATING A FIRE EVENT, THE PRESSURIZATION FANS SHALL BE COMMANDED TO RUN BY THE FA SYSTEM.
2. THE SUPPLY AIR ISOLATION DAMPER SHALL BE COMMANDED OPEN. UPON VERIFICATION OF DAMPER POSITION VIA THE ASSOCIATED END SWITCHES THE FAN SHALL BE ACTIVATED AND THE VFD SHALL ACCELERATE FAN TO PRESET SPEED. THIS SPEED SHALL BE SET DURING BALANCING TO PROVIDE THE AIRFLOW REQUIRED TO ACHIEVE AND MAINTAIN A DIFFERENTIAL STATIC PRESSURE BETWEEN THE STAIRWELL AND THE BUILDING INTERIOR OF 0.05" (ADJ.).
3. ONCE ACTIVATED THE FAN SHALL NOT SHUT OFF UNTIL MANUALLY DEACTIVATED.



Additions and Renovations to Harrah's Cherokee Valley River

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HVAC CONTROLS

M-817

4/27/2023 10:38:10 AM
DRAWING PRINTED FULL SIZE (ISO A1) - IN NAF: 2000MM(L) PRINTED HALF SIZE (ISO A3) - IF ON A SHEET 'A' PLOT WITH 3.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED ASSAY 1:1 THIRD SIZE (27.5"H) = 11.5"H X 15.75" WILL FIT TIGHTLY ON A 11"x17" INDIVIDUAL 22", 24", 18", 12" AND 120" VIEW SCALES WILL TYPICALLY BE MULTIPLYING THE DENOMINATOR BY AND MAKING THE NUMERATOR 1. 1:50 EXAMPLE: 1.5"H = 4" X 1:100 WILL BE SCALED TO 1/4"=1'-0"

7 DocuSign Envelope ID: 31C67779-8015-4E11-8D69-F10DFA204BA4

VALLEY RIVER HOTEL EXPANSION POST-FIRE PURGE PANEL

LEGEND			LED LIGHT SEQUENCE	OPERATOR SEQUENCE
(W)	WHITE INDICATOR - 'NORMAL' STATUS - NO ALARM, TROUBLE, SUPERVISORY OR FAULT SIGNALS BEING REPORTED		PANEL LED LIGHT SEQUENCE OF OPERATIONS: 1. NORMAL OPERATION (NO ALARMS OR SMOKE PURGE OPERATION) a. THE NORMAL LIGHTS SHALL ALL BE ON. b. ALL OTHER LIGHTS SHALL BE OFF. 2. ALARM OR SMOKE PURGE OPERATION a. THE NORMAL LIGHTS SHALL ALL BE OFF. b. ALL LIGHTS SHALL BEHAVE ACCORDING TO THE ADJACENT LEGEND INSTRUCTIONS FOR EACH BUTTON TYPE.	THE FOLLOWING ARE INSTRUCTIONS FOR OPERATION OF SMOKE REMOVAL SYSTEM: 1. TO ACTIVATE THE SMOKE REMOVAL SYSTEM FOR A SPECIFIC FLOOR/ZONE, TURN THE MANUAL SWITCH TO THE "ON" POSITION. ASSOCIATED DAMPER(S) WILL OPEN AND FAN(S) WILL ACTIVATE FOR SMOKE REMOVAL. 2. WHEN COMPLETE, TURN THE MANUAL SWITCH TO THE "OFF" POSITION. ASSOCIATED DAMPER(S) WILL CLOSE AND FAN(S) WILL DEACTIVATE. 3. ADDITIONAL MAKEUP AIR WILL BE ACCOMPLISHED BY OPENING EXTERIOR DOORS/WINDOWS PRIOR TO ACTIVATING THE SMOKE REMOVAL SYSTEM FOR EACH SPECIFIC FLOOR/ZONE.
(G)	GREEN INDICATOR - DAMPER OPEN/FAN RUNNING			
(R)	RED INDICATOR - DAMPER CLOSED/FAN OFF			
(A)	AMBER INDICATOR - FAULT			
	EXHAUST AIR	EXHAUST AIRFLOW		
		FSD FIRE/SMOKE DAMPER		
	EXHAUST/SUPPLY FAN	MD MOTORIZED DAMPER		

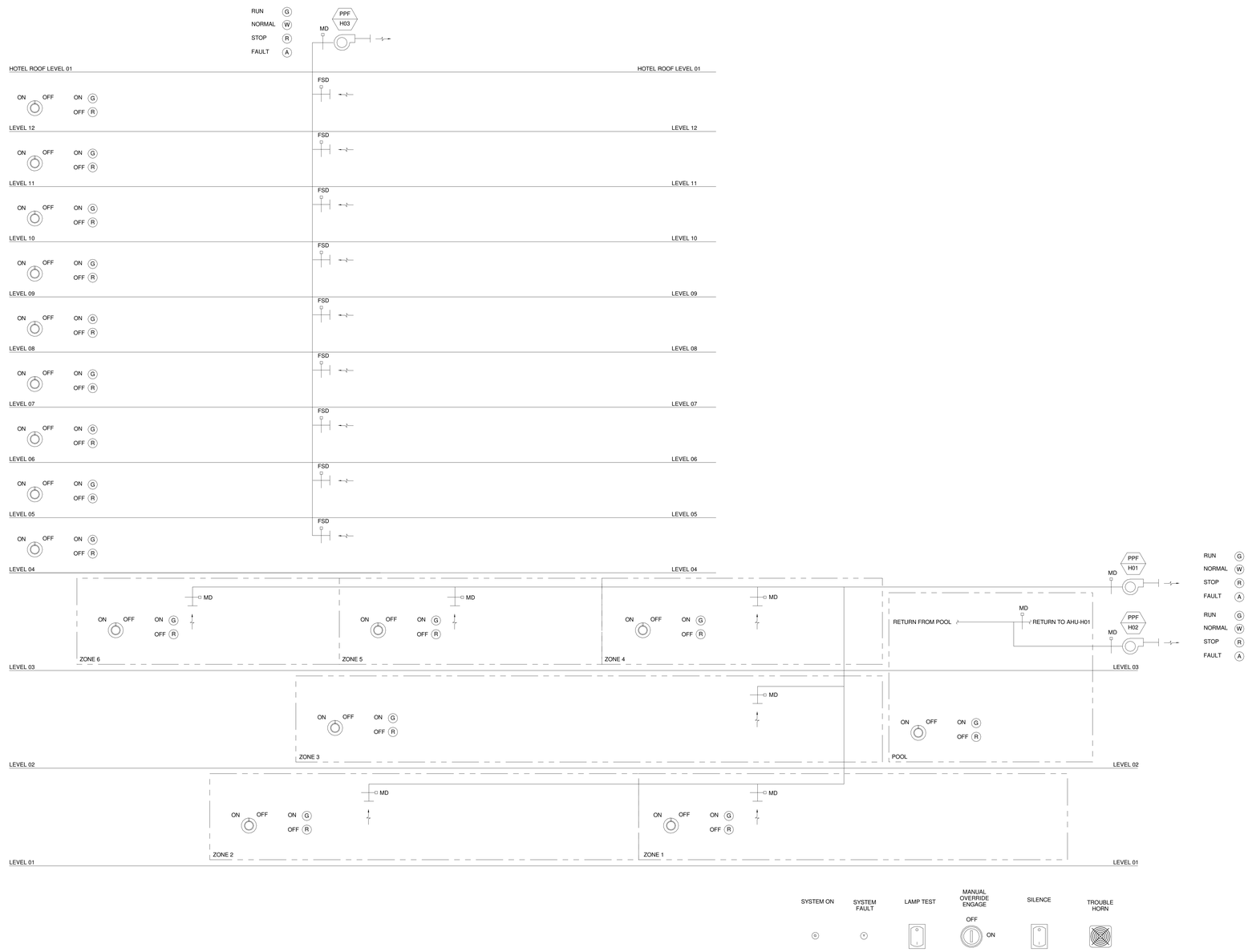
POST-FIRE PURGE PANEL STATUS LEGEND NOTES :

1. PROVIDE A PLAQUE WALL MOUNTED ADJACENT TO THE FIREFIGHTER SMOKE CONTROL PANEL. PLAQUE SHALL BE 1/16" THICK PLASTIC LAMINATE. FACE SHALL BE RED, ENGRAVED LETTERS SHALL BE WHITE. SECURE NAMEPLATE TO SURFACES WITH SCREWS. ADHESIVE CEMENT SHALL NOT BE ALLOWED. PLAQUE TO READ AS DESCRIBED.

KEY NOTES :

(1) NEMA 1 ENCLOSURE WITH HINGED FRONT PANEL.

RISER DIAGRAM



Additions and Renovations to Harrah's Cherokee Valley River

777 Casino Parkway
Murphy, NC 28906

JCJARCHITECTURE
120 HUYSHOPE AVENUE
SUITE 400
HARTFORD, CT 06106
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PERMIT SET
01/31/2023

NORTH CAROLINA PROFESSIONAL 039457 ENGINEER EDWARD DALTON
1/30/2023

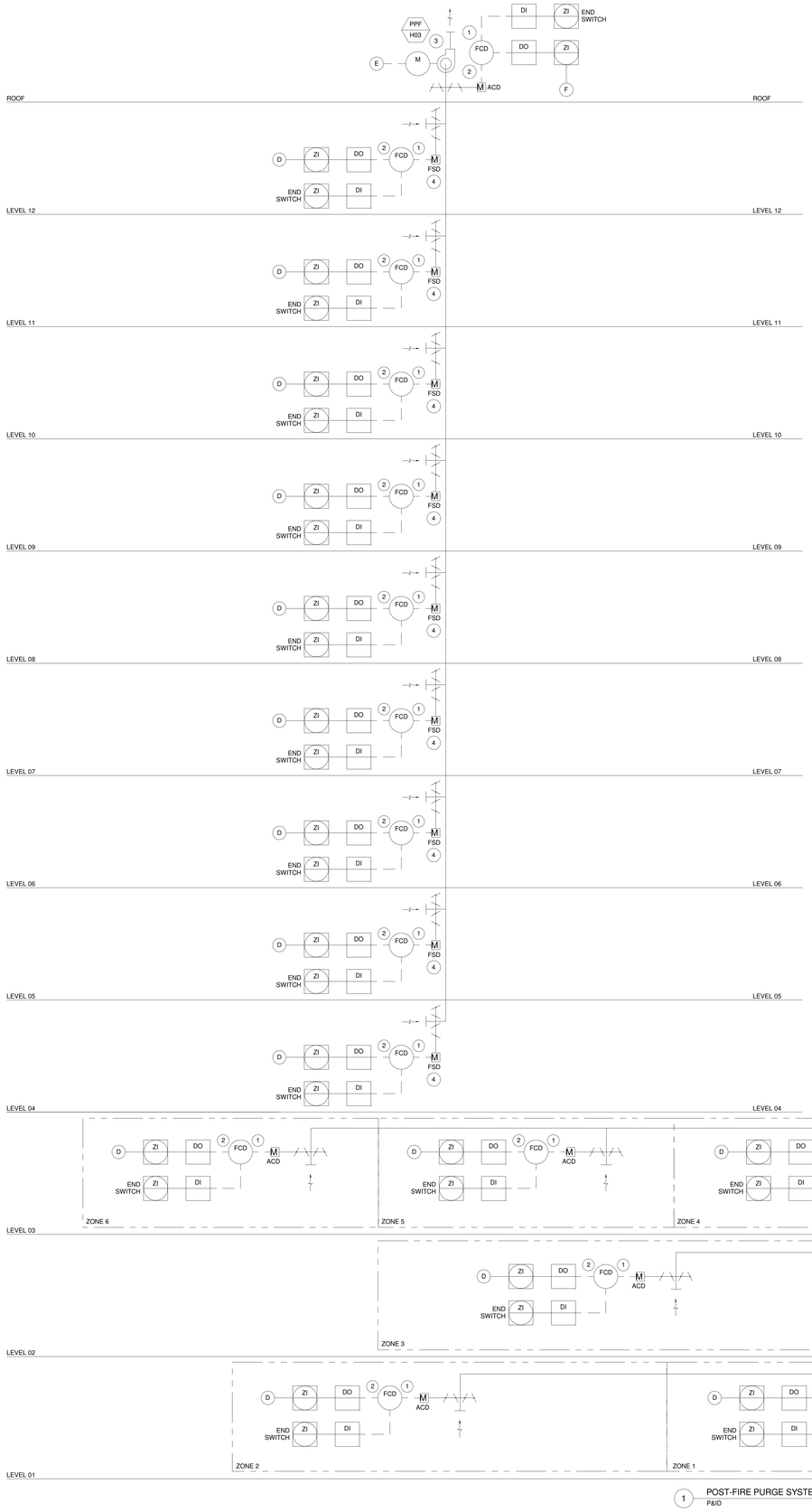
ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	NTS
REVISIONS	

HVAC CONTROLS

M-818

1/30/2023 11:22:25 AM
DRAWING PRINTED FULL SIZE (ISO A1) ON A1 PLUS SIZED DRAWING PRINTED ON A3 SIZE (50% ANSI B) IF NOT 100% THEN ADJUST SCALE FACTOR ACCORDINGLY AND CHANGE THE NUMBER FOR 1 FOR EXAMPLE 1.5"=1'-0" FOR SCALES AT 3/4", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DIGIT(S) ONLY. EXAMPLE 1/8"=1'-0" AT (25%) WILL BE 3/4"=1'-0" FOR SCALES AT 3/4", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DIGIT(S) ONLY. EXAMPLE 1/8"=1'-0" AT (25%) WILL BE 3/4"=1'-0" FOR SCALES AT 3/4", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DIGIT(S) ONLY. EXAMPLE 1/8"=1'-0" AT (25%) WILL BE 3/4"=1'-0" FOR SCALES AT 3/4", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DIGIT(S) ONLY. EXAMPLE 1/8"=1'-0" AT (25%) WILL BE 3/4"=1'-0" FOR SCALES AT 3/4", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DIGIT(S) ONLY. EXAMPLE 1/8"=1'-0" AT (25%) WILL BE
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1 POST-FIRE PURGE SYSTEM
P&ID

GENERAL NOTES :

1. REFER TO SEQUENCE OF OPERATIONS.
2. REFER TO DRAWING M-801 FOR INSTRUMENTATION SYMBOLS AND LEGEND.
3. FOR SCHEDULES REFER TO M-600 SERIES DRAWINGS.
4. FANS, DUCTWORK, DAMPERS AND CONTROL DEVICES SHOWN ARE BY DIVISION 23. CONTROL WIRING AND LOGIC ARE BY DIVISION 28.
5. REFER TO DRAWING M-701 & M-702 FOR AIR BALANCE REQUIREMENTS.

NOTES ON VFD'S :

1. VFD KEYPAD SHALL BE LOCKED OUT.
2. VFD SHALL BE INSTALLED WITHOUT BYPASS.
3. CONTROL WIRING TO/FROM VFD SHALL BE PROTECTED WITH 2-HOUR CONSTRUCTION.

KEY NOTES :

1. CONTROLS CONTRACTOR TO PROVIDE AND INSTALL AUTOMATIC CONTROL DAMPER AND COMBINATION FIRE/SMOKE DAMPER AS SHOWN ON DIAGRAM. FIRE ALARM AND ELECTRICAL CONTRACTOR(S) TO WIRE ADDRESSABLE RELAY MODULES FOR DAMPER CLOSURE DURING FIRE ALARM ACTIVATION. ACDS AND FSDS SHALL BE POWERED CLOSED AND FAIL OPEN.
2. CONTROLS CONTRACTOR TO PROVIDE DAMPER WITH TWO (2) AUXILIARY CONTACTS (END SWITCHES). MONITORED BY THE FIREFIGHTER'S POST-FIRE PURGE PANEL.
3. MONITORING OF FAN DISCONNECT SWITCH POSITION SHALL BE PERFORMED BY THE FIREFIGHTER'S POST-FIRE PURGE PANEL. IF THE DISCONNECT SWITCH IS OUT OF THE NORMAL POSITION, AN AMBER FAULT LIGHT SHALL INDICATE ON THE FIREFIGHTER'S POST-FIRE PURGE PANEL.
4. PROVIDE ADDRESSABLE FIRE SMOKE DAMPER WITHOUT INTEGRAL SMOKE DETECTOR. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

SEQUENCE OF OPERATIONS

A. GENERAL

1. THE POST-FIRE SMOKE PURGE SEQUENCE SHALL BE MANUALLY ACTIVATED AT THE FIRE COMMAND CENTER.
2. THE POST-FIRE PURGE SEQUENCE SHALL BE CONTROLLABLE THROUGH THE POST-FIRE PURGE PANEL.
3. SMOKE-PURGE MODE FAN SPEEDS SHALL BE SET DURING SYSTEM BALANCING.
4. PRIORITY: THE STAIR PRESSURIZATION SMOKE CONTROL SYSTEM SHALL HAVE PRIORITY OVERRIDE OF THE POST-EVEN SMOKE REMOVAL SYSTEM AND THE FIRE ALARM SYSTEM. THE POST-EVEN SMOKE REMOVAL SYSTEM SHALL HAVE PRIORITY OVERRIDE OF THE FIRE ALARM SYSTEM.
5. OVERRIDE ENGAGE : ACTIVATION OF THE OVERRIDE ENGAGE SWITCH ON THE SMOKE REMOVAL PANEL SHALL OVERRIDE THE FIRE ALARM SYSTEM. DEACTIVATION OF THE OVERRIDE ENGAGE SWITCH SHALL REVERT THE FIRE ALARM SYSTEM TO NORMAL / STANDBY / AUTOMATIC MODE.
6. THE POST-FIRE SMOKE PURGE SEQUENCE SHALL BE INITIATED FOR EACH FLOOR INDEPENDENTLY VIA MANUAL SWITCH AT THE POST FIRE SMOKE REMOVAL PANEL IN THE FIRE COMMAND CENTER. ACTIVATION SEQUENCE SHALL BE AS FOLLOWS FOR EACH FLOOR:

B. LEVELS 4 THRU 12

1. THE SPECIFIC FLOOR EXHAUST DAMPER SHALL OPEN AND PPF-H03 ISOLATION DAMPER SHALL OPEN. PPF-H03 SHALL ACTIVATE WHEN END SWITCHES PROVES DAMPER OPEN.
2. THE SYSTEM SHALL BE CAPABLE OF PURGING ONE FLOOR AT A TIME. THE ACTIVATION AT A SECOND FLOOR DAMPER SHALL BE PREVENTED UNTIL THE FIRST DAMPER IS PROVEN CLOSED.

B. LEVELS 1 THRU 3

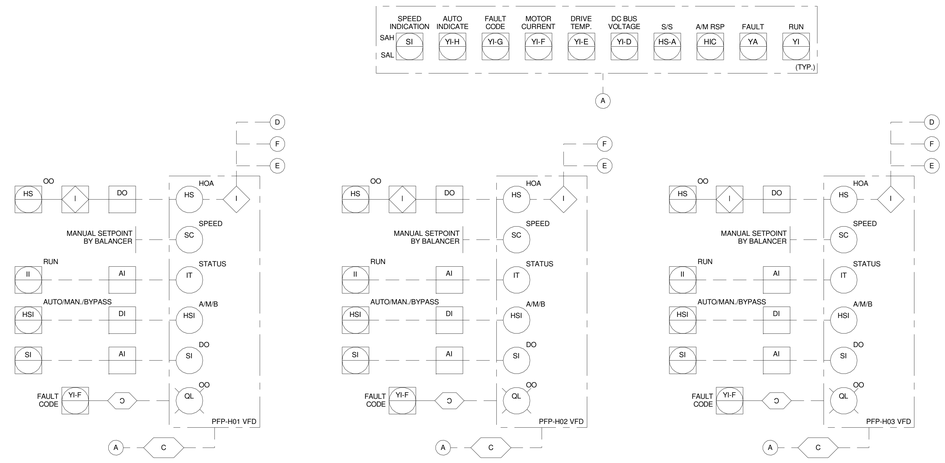
1. THE SPECIFIC FLOOR AND ZONE EXHAUST DAMPER SHALL OPEN AND PPF-H01 ISOLATION DAMPER SHALL OPEN. PPF-H01 SHALL ACTIVATE WHEN END SWITCH PROVES DAMPER OPEN.
2. THE SYSTEM SHALL BE CAPABLE OF PURGING ONE ZONE AT A TIME. THE ACTIVATION AT A SECOND ZONE DAMPER SHALL BE PREVENTED UNTIL THE FIRST DAMPER IS PROVEN CLOSED.

C. POOL

1. AHU-H01 SHALL DEACTIVATE AND AHU-H01 ISOLATION DAMPER SHALL CLOSE. PPF-H02 ISOLATION DAMPER SHALL OPEN. PPF-H02 SHALL ACTIVATE WHEN END SWITCH PROVES DAMPER OPEN AND AHU-H01 DAMPER CLOSED.

D. DEACTIVATION

1. THE EXHAUST FAN SHALL RUN CONTINUOUSLY UNTIL MANUALLY DEACTIVATED VIA THE POST FIRE-PURGE PANEL.
2. UPON THE MANUAL DEACTIVATION OF THE SYSTEM THE THE EXHAUST FAN SHALL DE-ENERGIZE AND THE FLOOR EXHAUST AIR DAMPER SHALL CLOSE AFTER A 60 SECOND (ADJ) DELAY.
3. AFTER THE EXHAUST FAN HAS BEEN DEACTIVATED FOR 5 MINUTES, AND NO OTHER FLOOR HAS BEEN ACTIVATED, THE EXHAUST FAN ISOLATION DAMPERS SHALL CLOSE.



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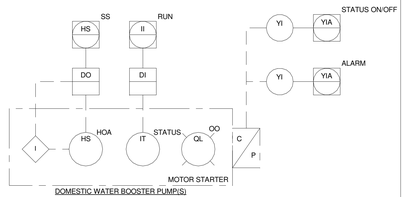
ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	NTS
REVISIONS	

HVAC CONTROLS

M-819

1/30/2023 11:22:28 AM
DRAWING PRINTED FULL SIZE (30"H) - SHAFT DRAWING PRINTED HALF SIZE (15H) UNLESS OTHERWISE NOTED ON SHEET. "IN CASE WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES (36WX42H) PRINTED HALF SIZE (18"H) - 11"(H) X 17"(W) WILL FIT ITS ENTIRETY ON A 11"x17" ARCHIVAL 12", 18", 24", 30" AND 120" VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 6 AND MAKING THE NUMERATOR 1 FOR EXAMPLE 1/8"=1'-0" (1/16) WILL BE 3/64"=1'-0" FOR SCALE AT 24", 30" AND 120" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR/DOUBLE AND CHANGE THE NUMERATOR TO 1. EXAMPLE 3/4

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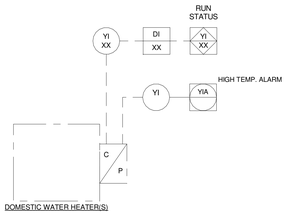


DOMESTIC WATER BOOSTER PUMP(S)

NOTES:

1. THE DOMESTIC WATER BOOSTER PUMP(S) ARE PROVIDED BY THE PLUMBING CONTRACTOR.
2. THE BAS SHALL MONITOR STATUS OF ALL PUMPS.
3. THE ATC CONTRACTOR SHALL BE RESPONSIBLE FOR INTERCONNECTION WIRING BETWEEN THE PUMP STARTERS TO THE BAS.
4. REFER TO PLUMBING PLANS FOR QUANTITY AND LOCATIONS.

1 DOMESTIC WATER BOOSTER PUMP MONITORING
SCALE: NTS

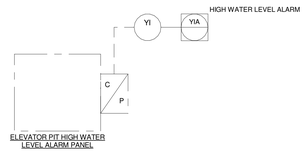


DOMESTIC WATER HEATER(S)

NOTES:

1. THE DOMESTIC WATER HEATERS IS PROVIDED BY THE PLUMBING CONTRACTOR.
2. THE EQUIPMENT PACKAGED CONTROLLER SHALL SIGNAL TO THE BAS.
3. THE ATC CONTRACTOR SHALL BE RESPONSIBLE FOR INTERCONNECTION WIRING BETWEEN THE WATER HEATER TO THE BAS.
4. REFER TO PLUMBING PLANS FOR QUANTITY AND LOCATIONS.

2 DOMESTIC WATER HEATER(S) MONITORING
SCALE: NTS

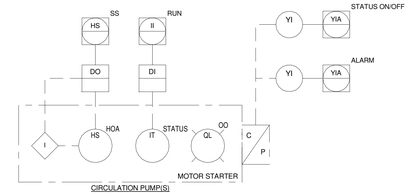


ELEVATOR PIT HIGH WATER LEVEL ALARM PANEL

NOTES:

1. THE ELEVATOR PIT HIGH WATER LEVEL ALARM PANEL IS PROVIDED BY THE PLUMBING CONTRACTOR.
2. THE EQUIPMENT PACKAGED CONTROLLER SHALL SIGNAL TO THE BAS.
3. THE ATC CONTRACTOR SHALL BE RESPONSIBLE FOR INTERCONNECTION WIRING BETWEEN THE ELEVATOR PIT HIGH WATER LEVEL ALARM PANEL TO THE BAS.
4. REFER TO PLUMBING PLANS FOR QUANTITY AND LOCATIONS.

3 BUILDINGS - ELEVATOR PIT MONITORING
SCALE: NTS

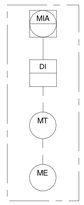


CIRCULATION PUMP(S)

NOTES:

1. THE CIRCULATION PUMP(S) ARE PROVIDED BY THE PLUMBING CONTRACTOR.
2. THE BMS SHALL MONITOR STATUS OF ALL PUMPS.
3. THE ATC CONTRACTOR SHALL BE RESPONSIBLE FOR INTERCONNECTION WIRING BETWEEN THE PUMP STARTERS TO THE BMS.
4. REFER TO PLUMBING PLANS FOR QUANTITY AND LOCATIONS.

4 CIRCULATION PUMP MONITORING
SCALE: NTS

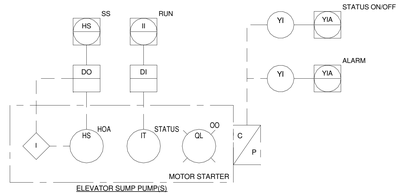


LEAK DETECTION

NOTES:

1. PROVIDE LEAK DETECTION IN THE FOLLOWING LOCATIONS:
   - WATER HEATERS: DWH-1, DWH-2
2. REFER TO PLUMBING PLANS FOR QUANTITY AND LOCATIONS.

5 LEAK DETECTION MONITORING
SCALE: NTS

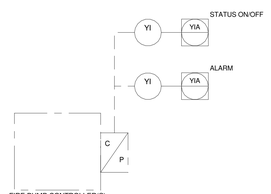


ELEVATOR SUMP PUMP(S)

NOTES:

1. THE ELEVATOR SUMP PUMP(S) ARE PROVIDED BY THE PLUMBING CONTRACTOR.
2. THE BMS SHALL MONITOR STATUS OF ALL PUMPS.
3. THE ATC CONTRACTOR SHALL BE RESPONSIBLE FOR INTERCONNECTION WIRING BETWEEN THE PUMP STARTERS TO THE BMS.
4. REFER TO PLUMBING PLANS FOR QUANTITY AND LOCATIONS.

6 ELEVATOR SUMP PUMP MONITORING
SCALE: NTS

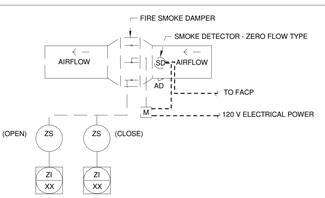


FIRE PUMP CONTROLLER(S)

NOTES:

1. THE FIRE PUMP CONTROLLER(S) ARE PROVIDED BY THE FIRE PROTECTION CONTRACTOR.
2. THE EQUIPMENT PACKAGED CONTROLLER SHALL SIGNAL TO THE BMS.
3. THE ATC CONTRACTOR SHALL BE RESPONSIBLE FOR INTERCONNECTION WIRING BETWEEN THE FIRE PUMP CONTROLLER(S) TO THE BMS.
4. REFER TO FIRE PROTECTION PLANS FOR QUANTITY AND LOCATIONS.

7 FIRE PUMP MONITORING
SCALE: NTS



A. GENERAL

1. REQUIREMENTS OF "SEQUENCE OF CONTROLS - GENERAL", "SEQUENCE OF CONTROLS - STANDBY POWER" AND "CONTROL SYSTEM NOTES" ON DRAWING M-800 APPLY TO ALL SEQUENCES.
2. THE ATC CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE INSTALLATION OF CONTROL AND MONITORING COMPONENTS REQUIRED FOR INTERCONNECTION TO THE FIRE ALARM SYSTEM. REFER TO COORDINATION DETAILS FOR SMOKE DETECTORS ON DETAIL DRAWING H-604.
3. THE DAMPER END SWITCHED SHALL MONITOR DAMPER POSITION.

B. DAMPER CONTROL

1. DURING NORMAL SYSTEM OPERATION THE DAMPER SHALL BE POWERED TO THE OPEN POSITION.
2. WHEN EITHER THE DUCT MOUNTED SMOKE DETECTOR OR HIGH TEMPERATURE HEAT SWITCH(SET AT 163°F(ADJ)) ARE TRIPPED, THE DAMPER SHALL CLOSE FULLY. AN ALARM SHALL BE GENERATED TO THE FA SYSTEM AND SIMULTANEOUSLY TO THE BAS.
3. WHEN A ALARM CONDITION HAS BEEN CLEARED THE DAMPER WILL BE REQUIRED TO BE MANUALLY RESET.
4. UPON A LOSS OF MAIN ELECTRICAL POWER ALL DAMPERS SHALL FAIL CLOSED.

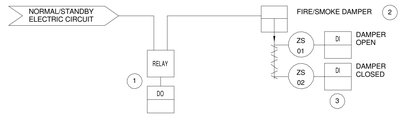
C. ALARMS

1. THE FOLLOWING SHALL INITIATE A SPECIFIC ALARM NOTICE AT THE FIRE ALARM SYSTEM.
   a. WHEN EITHER THE DUCT MOUNTED SMOKE DETECTOR OR HIGH TEMPERATURE HEAT SWITCH (SET AT 163°F(ADJ)) ARE TRIPPED, - DELAY = NONE(ADJ)
   b. ANY END SWITCH INDICATED DAMPER NOT IN CORRECT POSITION. - DELAY = NONE(ADJ)

D. POST FIRE PURGE CONTROL

1. REFER TO DWG. M-818 FOR DETAIL ON DAMPER CONTROL DURING POST FIRE PURGE OPERATION.

8 COMBINATION FIRE/SMOKE DAMPER CONTROL
SCALE: NTS



GENERAL NOTES:

A. REFER TO MECHANICAL RISER DIAGRAMS AND FLOOR PLANS FOR QUANTITY AND LOCATION OF FIRE/SMOKE DAMPERS.
B. REMOTE TEST SWITCH FOR DAMPER NOT REQUIRED. REMOTE TESTING ACHIEVED AT SMOKE REMOVAL PANEL.

KEYED NOTES:

1. DDC SYSTEM RELAY MODULE / DIGITAL OUTPUT SIGNAL FOR FIRE/SMOKE DAMPER CONTROL FURNISHED/INSTALLED/WIRED BY DIVISION 23. DAMPER SHALL OPEN AS INDICATED ON SMOKE REMOVAL SEQUENCE OF OPERATION.
2. FIRE/SMOKE DAMPER W/ END SWITCHES FURNISHED/INSTALLED BY DIVISION 23 AND WIRED BY DIVISION 26.
3. DDC SYSTEM SHALL MONITOR DAMPER END SWITCHES FURNISHED/INSTALLED/WIRED BY DIVISION 23.

9 SHAFT FIRE-SMOKE DAMPER COORDINATION DETAIL - DEDICATED NORMALLY CLOSED WITHOUT DETECTOR (POST FIRE SMOKE REMOVAL)
SCALE: NTS

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NORTH CAROLINA PROFESSIONAL 039457 ENGINEER EDWARD DALTON
1/30/2023

ISSUE	12/22/2022
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DRAWN	MWM
SCALE	NTS

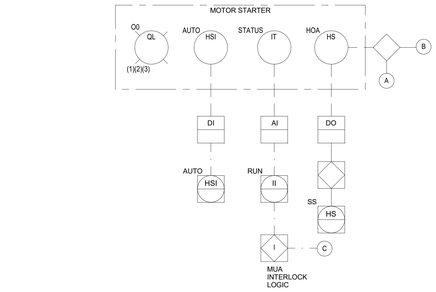
REVISIONS

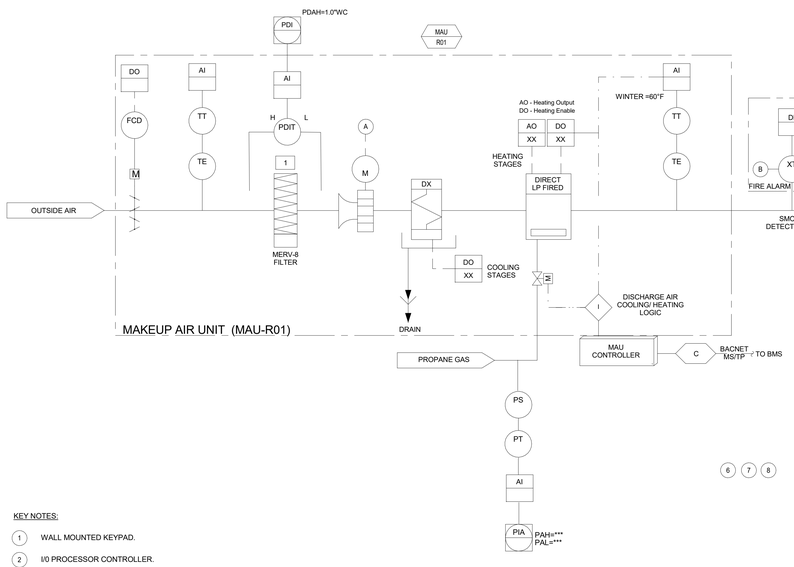
HVAC CONTROLS

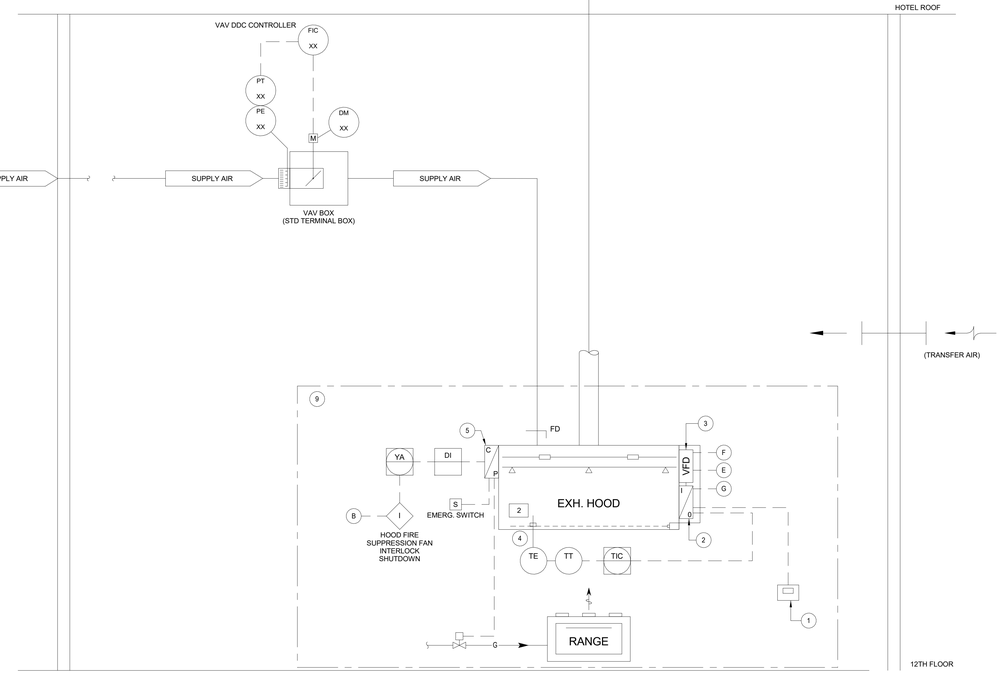
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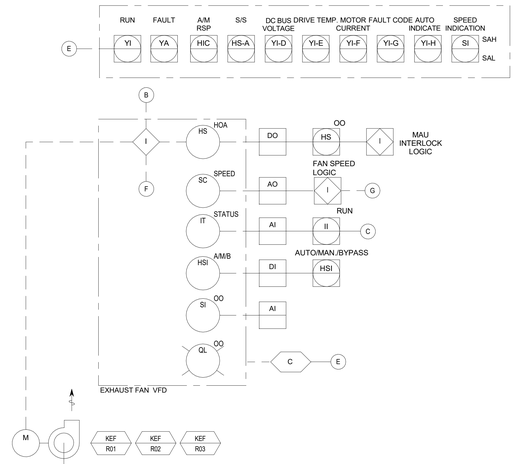
1/30/2023 11:22:31 AM
DRAWING PRINTED FULL SIZE (30"H) - IF NOT 24"X36" DRAWING PRINTED ON A1 SIZE (24"H) THIS SCALE IS NOT CORRECT - IF NOT EXACTLY 24" X 36" THEN ADJUST SCALE ACCORDINGLY
THIS DRAWING IS PART OF A SET. IF NOT WITH A FULL SET OF EXTRA SPACE ON ALL FOUR SIDES, DRAWING PRINTED ON A1 SIZE (30"H) WILL FIT ON A SHE

790









KEY NOTES:

1. WALL MOUNTED KEYPAD.
2. I/O PROCESSOR CONTROLLER.
3. VARIABLE FREQUENCY DRIVE.
4. TEMPERATURE SENSING THERMOSTAT (TST), INSTALLED IN HOOD & PRESET TO 90 DEGREE F AT FACTORY.
5. ANSUL R-102 HOOD FIRE SUPPRESSION SYSTEM. CONTROLS CONTRACTOR IS RESPONSIBLE FOR ALL INTERCONNECTING CONTROL WIRING. HOOD TO BE FACTORY INSTALLED WITH SUPPRESSION NOZZLE & SENSORS. FINAL PIPE CONNECTION BY KITCHEN CONSULTANT.
6. KITCHEN HOOD IS INTERLOCKED WITH THE MAKE-UP AIR UNIT TO RUN IF NOT ALREADY ENERGIZED & SHALL CONFORM TO THE SPECIFIED SEQUENCE OF OPERATIONS.
7. CONTROLS CONTRACTOR TO PROVIDE ALL INTERCONNECTING CONTROL COMPONENTS, WIRING AND SOFTWARE FOR CONTROL OF MUA . COORDINATE WITH UNIT MANUFACTURER ON UNIT MOUNTED CONTROLS.
8. ALL INDICATED CONTROLS AND INTERCONNECTING WIRING BY ATC CONTRACTOR UNLESS OTHERWISE SPECIFIED.
9. KITCHEN HOOD PROVIDED WITH MANUFACTURER'S CONTROL SYSTEM (MARVEL) AND CONTROL PANEL. ALL MAU, KEF AND VAV SHALL OPERATE AS CONTROLLED BY THE HOODS CONTROLLER. POINTS SHOWN SHALL BE READABLE BY BAS.

GENERAL NOTES

1. REFER TO SEQUENCE OF OPERATION.
2. REFER TO INSTRUMENTATION SYMBOLS AND LEGEND.
3. FOLLOWING SYMBOLS INDICATES POINT OF RESPONSIBILITY.
   - 1 PROVIDED AND INSTALLED BY UNIT MANUFACTURER.
   - 2 PROVIDED BY UNIT MANUFACTURER, INSTALLED BY CONTRACTOR.
   - 3 BY LSS/FIRE ALARM CONTRACTOR.
4. SEE SCHEDULES FOR EQUIPMENT INFORMATION.
5. MOTOR CURRENT TRANSDUCER BY ATC CONTRACTOR.
6. ONE MAKEUP AIR UNIT AND ONE KITCHEN EXHAUST FAN PER HOOD. DIAGRAM AND SEQUENCE SHOWN IS PER HOOD.

HOOD CONTROLLER SEQUENCE OF OPERATIONS

A. GENERAL
   1. HOOD CONTROLLER IS FURNISHED AND INSTALLED BY THE HOOD MANUFACTURER.
   2. ATC CONTRACTOR IS RESPONSIBLE FOR PROGRAMMING, SEQUENCING AND ALL INTERCONNECTING CONTROL WIRING.
   3. KITCHEN HOOD OPERATION IS INTERLOCKED WITH MAKE UP AIR UNIT
B. ALARMING
   1. ANSUL SYSTEM ACTIVATION ALARM SHALL BE SENT TO THE BMS AND FIRE COMMAND. EXHAUST FAN SHALL RUN AT 100% UNTIL MANUALLY RESET. MAU SHALL BE DE-ENERGIZED AND DAMPER CLOSED.
C. START-UP
   1. STAR UP THROUGH HOOD MOUNTED TOUCH PAD AND BMS SCHEDULED OCCUPIED/UNOCCUPIED HOURS OR EVENTS.
   2. UPON START UP, EXHAUST FAN SHALL START AS INDICATED ON AND MAU SHALL START.
   3. UPON A SIGNAL FROM THE KITCHEN PROCESSOR CONTROL SYSTEM THE THE HOOD EXHAUST FAN SHALL START.
D. EXHAUST FAN VOLUME CONTROL
   1. THE HOOD CONTROLLER MEASURES TEMPERATURE AND MONITORS SMOKE GENERATION THROUGH HOOD MOUNTED TEMPERATURE SENSORS.
   2. UPON A SIGNAL TO START EXHAUST FAN , THE HOOD CONTROLLER SHALL SIGNAL THE BMS SYSTEM TO AIR FLOW RATE.
   3. AS THE HOOD CONTROLLER DETECTS A RISE IN TEMPERATURE, A SIGNAL SHALL BE SENT TO THE EXHAUST FAN VFD TO INCREASE SPEED.
   4. WHEN THE HOOD CONTROLLER DETECTS SMOKE, THE FAN WILL BE SIGNALED TO 100% SPEED.

KITCHEN HOOD RESPONSIBLITIES:

1. HOOD MANUFACTURER TO FACTORY PRE-MOUNT CONTROLLER SYSTEM OR EQUAL.
2. HOOD MANUFACTURER TO PRE-WIRE SYSTEM COMPONENTS WITH PLUG-N-PLAY CABLES PROVIDED BY HALTON.
3. HALTON TO PRE-PROGRAM THE SYSTEM BASED ON THE APPLICATION, USING THE MARVEL MENU (I.E. TEMPERATURE SPAN, MINIMUM SPEED, NUMBER OF SENSORS).
4. ATC CONTRACTOR TO FIELD-WIRE THE I/O PROCESSOR INSIDE THE UTILITY CABINET WITH AN INPUT OF 115/1 OR 230/1 VAC FROM A DEDICATED CIRCUIT. THE OUTPUT WIRING TO BE CONNECTED TO THE HOOD LIGHTS.
5. ELECTRICAL CONTRACTOR TO FIELD-WIRE THE ELECTRONIC MOTOR STARTER (VFDs) INSIDE THE UTILITY CABINET BY CONNECTING 3-PHASE INPUT POWER FROM THE CIRCUIT BREAKERS. THE OUTPUT WIRING TO BE CONNECTED TO THE RESPECTIVE FAN MOTOR. THE INPUT AND OUTPUT WIRING SHALL BE RUN IN SEPARATE CONDUIT FOR EACH STARTER.
6. ATC CONTRACTOR TO CONNECT PLUG-N-PLAY CABLES FROM I/O PROCESSOR TO EACH HOOD.
7. ATC CONTRACTOR TO START UP THE SYSTEM BY PRESSING THE LIGHT AND FAN SWITCH ON KEYPAD TO VERIFY THE HOOD LIGHTS TURN ON AND THE FANS GO TO MINIMUM SPEED. CORRECT FAN ROTATION IF NECESSARY.
8. ATC CONTRACTOR TO AIR BALANCE THE SYSTEM BY PRESSING THE 100% SWITCH ON KEYPAD. SPEED ADJUSTMENTS ON BELT-DRIVE FANS TO BE MADE AT THE FAN, AND SPEED ADJUSTMENTS ON DIRECT DRIVE FANS TO BE MADE AT THE ELECTRONIC MOTOR STARTERS (VFDs).

1 KITCHEN VENTILATION CONTROL
CONTROL DIAGRAM

Additions and Renovations to Harrah's Cherokee Valley River

777 Casino Parkway
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SCALE	NTS

REVISIONS

5	2023-0214	BULLETIN 01

5

HVAC CONTROLS

M-821

DRAWING PRINTED FULL SIZE (30X42) - 24"x36" DRAWING PRINTED HALF SIZE (15"x18") - 1/2" EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15"x18") = 1/2 SCALE AT 24" x 36" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR ESSENTIALLY AND CHANGE THE NUMERATOR TO 1. 1/32ARE 1 24"x 0" AT 3/32" WILL FIT EXACTLY ON 11"x17" = 1/2"x15.5" WILL FIT EXACTLY ON 11"x17" INDIVIDUAL 1/2", 1/4", 1/8" AND 1/32" VIEW SCALES WILL TRANSLATE BY HALF'S TWO(THE DENOMINATOR BY 2 AND MAKING THE NUMERATOR 2 OVER EXAMPLE 1/8"=1'-0" AT 11"x17" (1/16) WILL BE 3/64"=1'-0" FOR SCALES

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GENERAL DEMO NOTES:

A. CONTRACTOR TO VERIFY IF EXISTING TERMINAL UNITS ARE SUITABLE FOR REUSE AND REPORT RESULTS TO THE DESIGN TEAM
   a. PROVIDE PRECONSTRUCTION TESTING & BALANCING OF ALL TERMINAL UNITS WITHIN THE SCOPE OF WORK THAT ARE EXISTING TO REMAIN, EXISTING TO BE RELOCATED, AND ARE BEING REBALANCED.
   b. CONFIRM DELTA-T ACROSS THE HEATING COIL, IF APPLICABLE.
   c. VISUALLY INSPECT COILS FOR CLEANLINESS.
   d. DETERMINE IF CONTROLS ARE FULLY OPERATIONAL.
   e. CONFIRM UNIT DOES NOT EMIT EXCESSIVE NOISE. IF TERMINAL UNIT IS NOT SUITABLE FOR REUSE, INFORM DESIGN TEAM AND REPLACE IN KIND.

B. THIS PROJECT INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. INFORMATION CONTAINED ON THIS DRAWING WAS OBTAINED FROM THE BEST AVAILABLE INFORMATION AND IS NOT INTENDED TO LIMIT THE SCOPE OF WORK.

C. CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTAL OF BID TO DETERMINE CONDITIONS AFFECTING THE EXECUTION OF THE WORK. AFTER VISITING THE SITE, REQUEST SUCH FURTHER INFORMATION AND/OR CLARIFICATION AS NECESSARY TO UNDERSTAND THE WORK REQUIRED AND TO PROPERLY ESTIMATE THE COST. CONTRACTORS, BY SUBMITTING A BID, ARE DEEMED TO BE COMPLETELY FAMILIAR WITH THE EXISTING CONDITION OF THE BUILDING AS IT INFLUENCES WORK DESCRIBED.

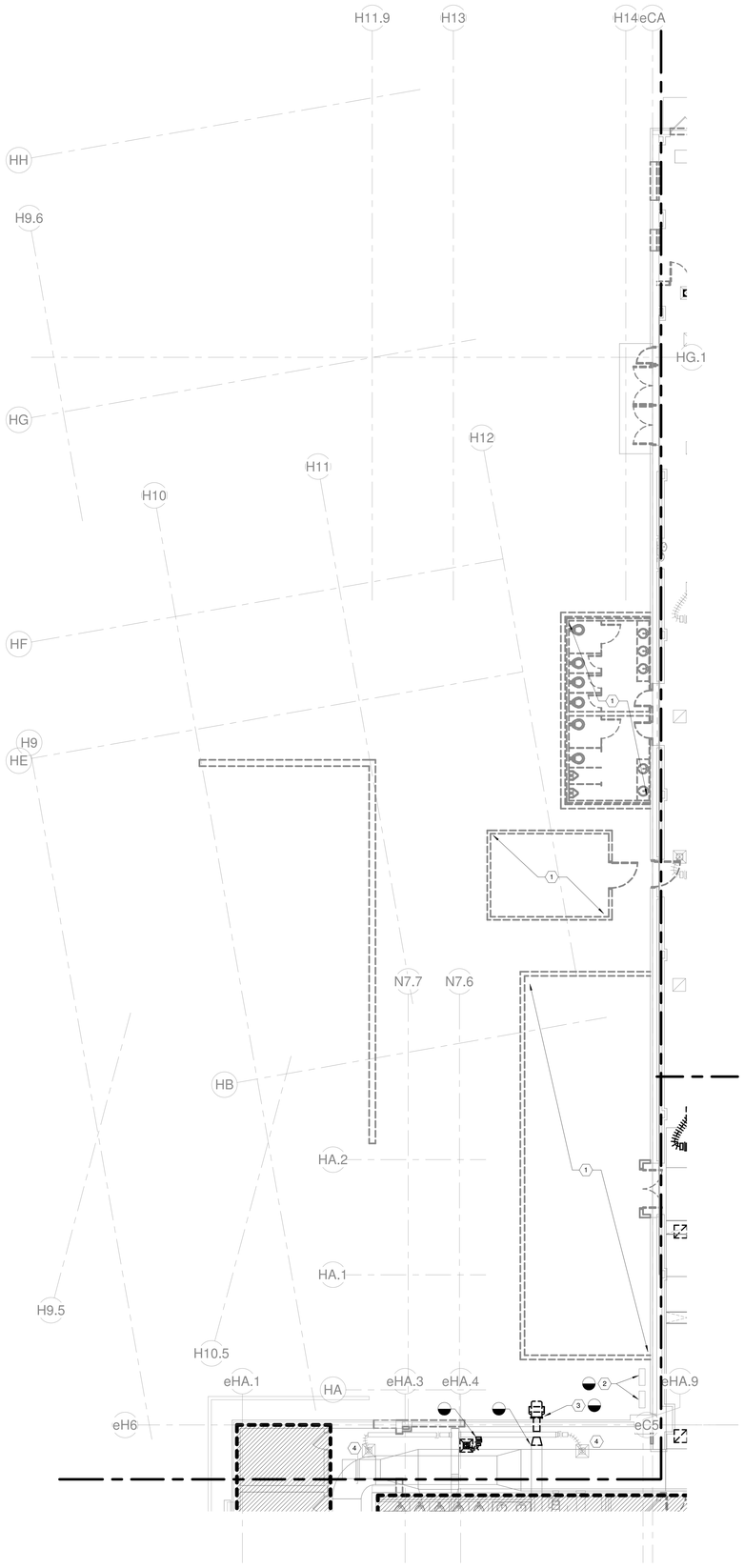
D. REMOVE AND LEGALLY DISPOSE OF ITEMS ASSOCIATED WITH THIS PROJECT AREA, UNLESS OTHERWISE NOTED. CONSTRUCTION MANAGER SHALL CLARIFY WITH OWNER ALL ITEMS THAT SHALL REMAIN THE PROPERTY OF THE OWNER PRIOR TO DISPOSAL. ITEMS TO BE SALVAGED MAY BE REMOVED FROM THE SITE AS WORK PROGRESSES. SALVAGED ITEMS MUST BE TRANSPORTED FROM THE SITE AS THEY ARE REMOVED.

E. DUCTWORK, INSULATION, OR EQUIPMENT TO REMAIN IS DAMAGED IN APPEARANCE OR IS UNSERVICEABLE. REMOVE DAMAGED OR UNSERVICEABLE PORTIONS AND REPLACE WITH NEW PRODUCTS OF EQUAL SIZE, CAPACITY, AND QUALITY.

F. DISCONNECT, DEMOLISH, AND REMOVE MECHANICAL SYSTEMS, EQUIPMENT, AND COMPONENTS INDICATED TO BE REMOVED.
   a. DUCTS TO BE REMOVED: REMOVE PORTION OF DUCTS INDICATED TO BE REMOVED AND CAP REMAINING DUCTS WITH SAME OR COMPATIBLE DUCTWORK MATERIAL AS REQUIRED. REFER TO ARCHITECTS PLAN/SPEC FOR WALL PATCHING.
   b. EQUIPMENT TO BE REMOVED: DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT. EQUIPMENT SHALL BE REMOVED FROM THE PREMISES AND LEGALLY DISPOSED OF.
   c. EQUIPMENT/DEVICES TO BE RELOCATED AND REINSTALLED: DISCONNECT AND CAP SERVICES AND REMOVE, CLEAN, AND STORE EQUIPMENT/DEVICES; WHEN APPROPRIATE REINSTALL, RECONNECT, AND MAKE EQUIPMENT/DEVICES OPERATIONAL.
   d. EQUIPMENT TO BE REMOVED AND SALVAGED: DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT AND DELIVER TO OWNER. COORDINATE WITH OWNER PRIOR TO DEMOLITION WORK COMMENCES REGARDING ANY ITEMS TO BE TURNED OVER TO THE OWNER.

KEYNOTES:

1. DEMOLISH ALL EXISTING MECHANICAL WORK IN THIS AREA.
2. EXISTING CONDENSING UNITS DOCUMENTED VIA SITE VISIT, CONTRACTOR TO FIELD VERIFY WHAT SPACES THESE CONDENSING UNITS SERVE. INTENT IS TO DEMOLISH EXISTING REFRIGERANT PIPING TO EXTEND AS REQUIRED AND RELOCATE UNITS UP TO THIRD FLOOR ROOF, REFER TO DRAWING MH-114A FOR NEW LOCATION.
3. DISCONNECT AND DEMOLISH EXISTING SIDEWALL FAN WITH ASSOCIATED DUCTWORK CONNECTION. PATCH EXISTING WALL. REFER TO DRAWING MH-111A FOR NEW EXTENDED DUCTWORK ROUTING WITH NEW ROOFTOP EXHAUST FAN.
4. REMOVE EXISTING DIFFUSER AND PREPARE TO BE REINSTALLED IN NEW CEILING GRID.



1 HVAC DEMO - FIRST FLOOR LEVEL - AREA A
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

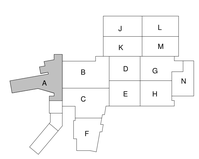
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KEY PLAN

PERMIT SET
01/31/2023

NORTH CAROLINA PROFESSIONAL 039457 ENGINEER EDWARD DALTON
1/30/2023

ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	As indicated

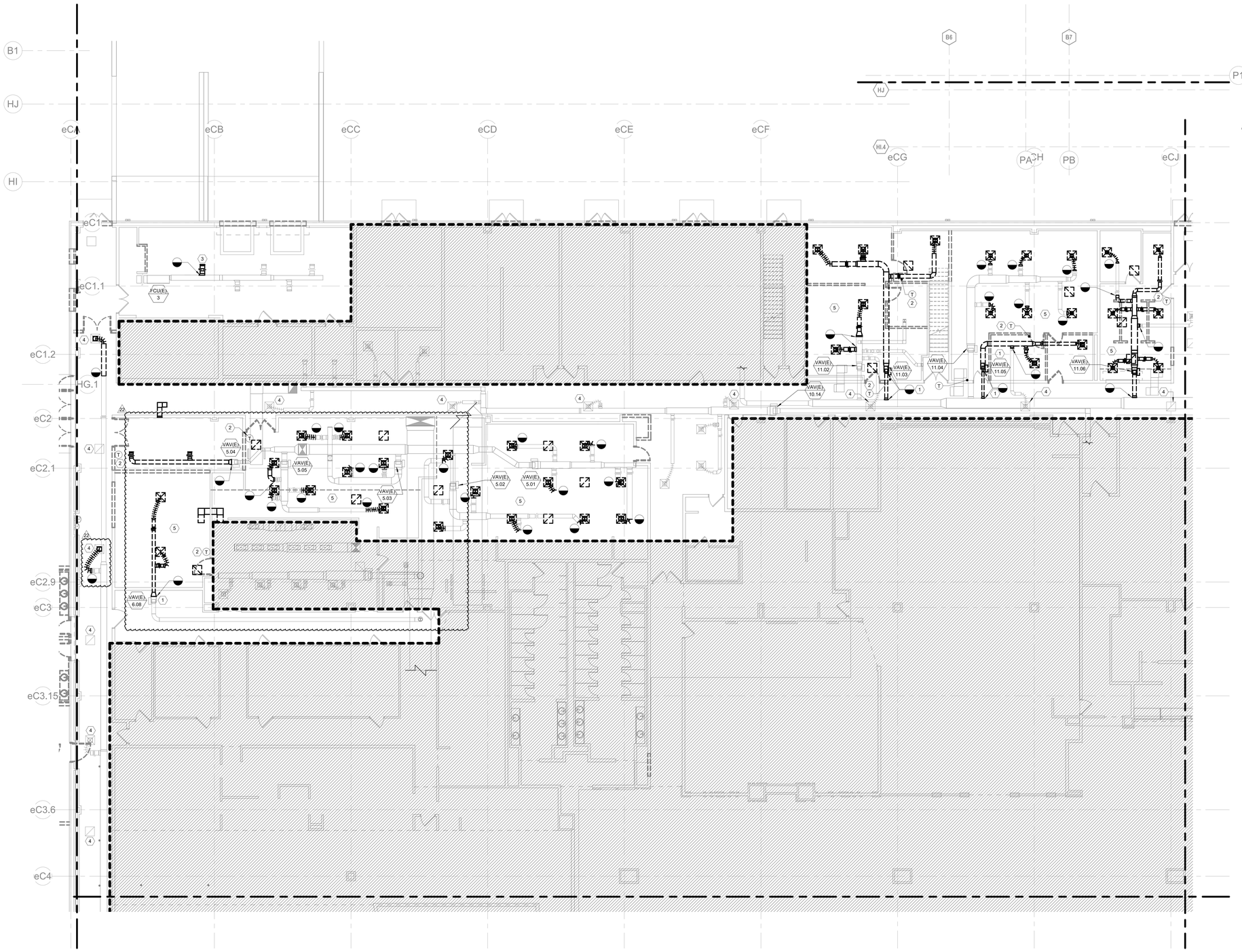
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HVAC DEMO - FIRST FLOOR LEVEL - AREA A

MD-111A

1/30/2023 11:22:35 AM DRAWING PRINTED FULL SIZE (30"H x 42"W)IF DRAWING PRINTED ANY SIZE OTHER THAN FULL SIZE IT IS A SMART PRINT. IT IS UP TO YOU TO SCALE ACCORDINGLY. IF YOU DO NOT HAVE EXTRA SPACE ON ALL FOUR SIDES, DRAWING PRINTED BEYOND ALTHOUGH IT WAS SIZED TO FIT ON 24" X 36" AND 120" HIGH SCALED WELL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY AND MARKING THE NUMERATOR AS 1. FOR EXAMPLE 1 OR 1/4"=1'-0" FOR SCALES AT 24" X 36" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR (32) DIRECTLY AND CHANGE THE NUMERATOR TO 1. FOR EXAMPLE 3/16"=1'-0" AT 24" X 36" IS WELL BE EASIEST TO 1/4"=1'-0" (3/16) WILL BE 3

760



1 HVAC DEMO - FIRST FLOOR LEVEL - AREA B
1/8" = 1'-0"

GENERAL DEMO NOTES:

A. CONTRACTOR TO VERIFY IF EXISTING TERMINAL UNITS ARE SUITABLE FOR REUSE AND REPORT RESULTS TO THE DESIGN TEAM
   a. PROVIDE PRECONSTRUCTION TESTING & BALANCING OF ALL TERMINAL UNITS WITHIN THE SCOPE OF WORK THAT ARE. EXISTING TO REMAIN, EXISTING TO BE RELOCATED, AND ARE BEING REBALANCED.
   b. CONFIRM DELTA-T ACROSS THE HEATING COIL, IF APPLICABLE.
   c. VISUALLY INSPECT COILS FOR CLEANLINESS.
   d. DETERMINE IF CONTROLS ARE FULLY OPERATIONAL.
   e. CONFIRM UNIT DOES NOT EMIT EXCESSIVE NOISE. IF TERMINAL UNIT IS NOT SUITABLE FOR REUSE, INFORM DESIGN TEAM AND REPLACE IN KIND.

B. THIS PROJECT INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. INFORMATION CONTAINED ON THIS DRAWING WAS OBTAINED FROM THE BEST AVAILABLE INFORMATION AND IS NOT INTENDED TO LIMIT THE SCOPE OF WORK.

C. CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTAL OF BID TO DETERMINE CONDITIONS AFFECTING THE EXECUTION OF THE WORK. AFTER VISITING THE SITE, REQUEST SUCH FURTHER INFORMATION AND/OR CLARIFICATION AS NECESSARY TO UNDERSTAND THE WORK REQUIRED AND TO PROPERLY ESTIMATE THE COST. CONTRACTORS, BY SUBMITTING A BID, ARE DEEMED TO BE COMPLETELY FAMILIAR WITH THE EXISTING CONDITION OF THE BUILDING AS IT INFLUENCES WORK DESCRIBED.

D. REMOVE AND LEGALLY DISPOSE OF ITEMS ASSOCIATED WITH THIS PROJECT AREA, UNLESS OTHERWISE NOTED. CONSTRUCTION MANAGER SHALL CLARIFY WITH OWNER ALL ITEMS THAT SHALL REMAIN THE PROPERTY OF THE OWNER PRIOR TO DISPOSAL. ITEMS TO BE SALVAGED MAY BE REMOVED FROM THE SITE AS WORK PROGRESSES. SALVAGED ITEMS MUST BE TRANSPORTED FROM THE SITE AS THEY ARE REMOVED.

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F. DISCONNECT, DEMOLISH, AND REMOVE MECHANICAL SYSTEMS, EQUIPMENT, AND COMPONENTS INDICATED TO BE REMOVED.
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KEYNOTES:

1. RELOCATE EXISTING VAV, SEE MH SERIES PLANS FOR NEW LOCATION.
2. RELOCATE EXISTING THERMOSTAT, SEE MH SERIES PLANS FOR NEW LOCATION.
3. RELOCATE EXISTING SIDEWALL GRILLE TO NEW LOCATION SHOWN ON SHEET MH-111B.
4. REMOVE EXISTING DIFFUSER AND PREPARE TO BE REINSTALLED IN NEW CEILING GRID.
5. EXISTING DIFFUSERS AND GRILLES IN THIS AREA SHOWN TO BE DEMOLISHED CAN BE REUSED WHERE POSSIBLE. CONTRACTOR SHALL INSPECT EXISTING DIFFUSERS AND GRILLES TO VERIFY THEY ARE IN PROPER WORKING CONDITION. CLEAN TO LOOK NEW PRIOR TO REUSE AS PART OF RENOVATION.

Additions and Renovations to Harrah's Cherokee Valley River

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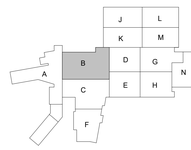
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KEY PLAN

BULLETIN 18
09/27/2023

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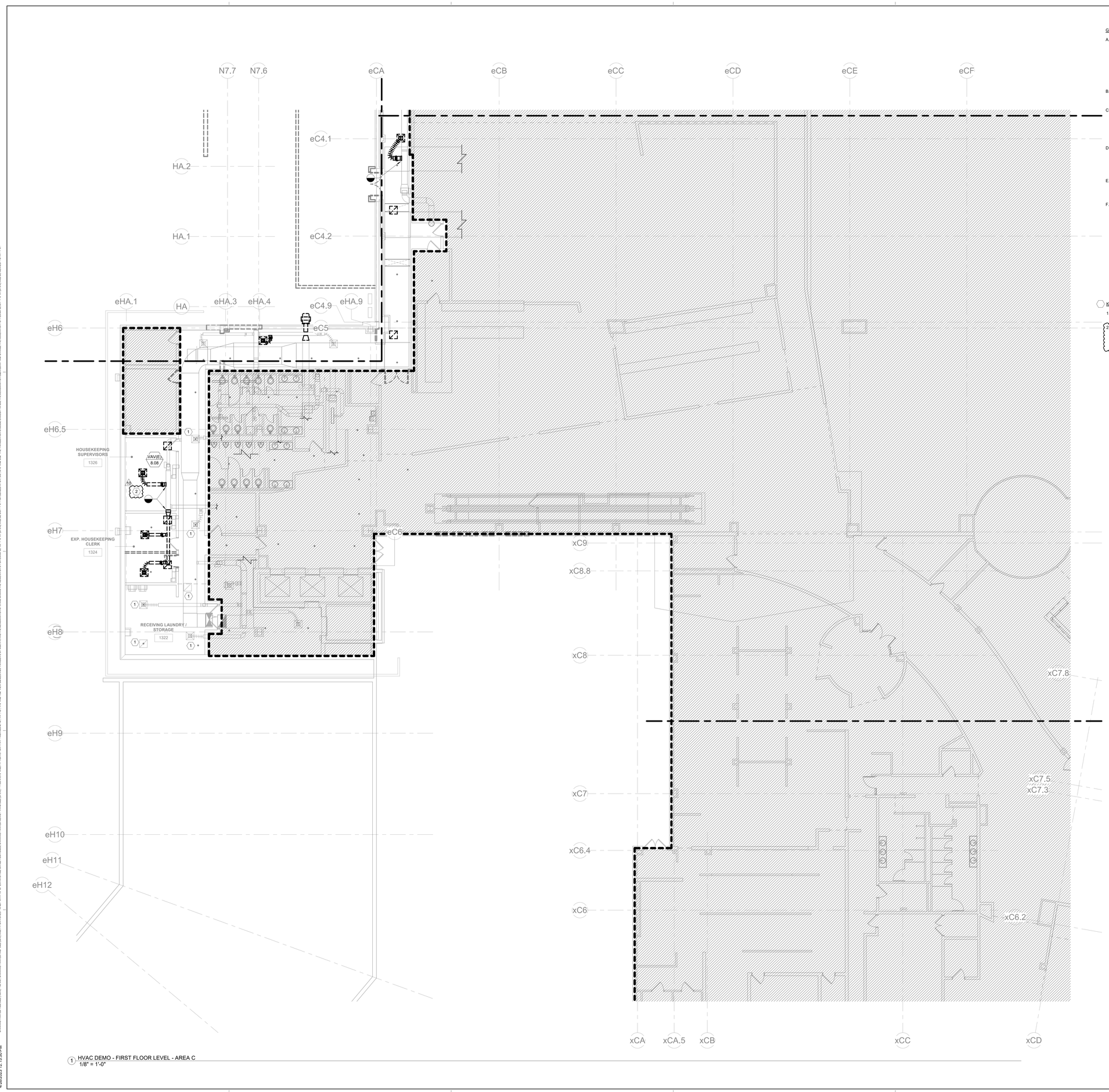
10	2023-0427	BULLETIN 06
22	2023-0927	BULLETIN 18

HVAC DEMO - FIRST FLOOR LEVEL - AREA B

MD-111B

9/26/2023 8:54:32 AM
DRAWING PRINTED FULL SIZE (100%) = 24"x36" DRAWING PRINTED HALF SIZE (50%) WILL FIT ON A SHEET 12"x18" WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (50%) = 11"x17" WILL FIT TIGHTLY ON 11"x17". ADDITIONAL 1/2", 1/4", 1/8", 1/16" AND 1/32" VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR/DIVISOR BY 2 AND MARKING THE NUMERATOR AS 1. FOR EXAMPLE, 1-3/4"=1'-0" (1/16) WILL BE 3/4"=1'-0" FOR SCALES AT 24" x 36". 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR/DIVISOR AND CHANGE THE NUMERATOR TO 1. 1-5/8"=1'-0" (3/16) WILL BE 5/8"=1'-0" (1/16).

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1 HVAC DEMO - FIRST FLOOR LEVEL - AREA C
1/8" = 1'-0"

GENERAL DEMO NOTES:

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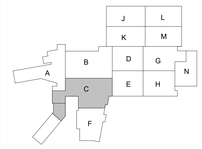
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KEY PLAN

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04/27/2023

NORTH CAROLINA PROFESSIONAL ENGINEER 039457 STEPHEN M. SPRENGER
4/27/2023

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HVAC DEMO - FIRST FLOOR LEVEL - AREA C

MD-111C

4/26/2023 12:15:50 PM
DRAWING PRINTED FULL SIZE (30X42) UNLESS OTHERWISE NOTED. IF NOT 30X42 DRAWING PRINTED HALF SIZE (15X21) WILL FIT ON A SHEET. IF NOT WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15X21) WILL FIT ON A SHEET. IF NOT WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15X21) WILL FIT ON A SHEET. IF NOT WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15X21) WILL BE 3/64"=1'-0" FOR SCALES AT 3/8", 3/16" AND 1/32". THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR ESSENTIALLY AND CHANGE THE NUMERATOR TO 1. EXAMPLE: 3/16"=1'-0" AT (15"X21") PLOT = 1/16"=1'-0". ARCHITECTURAL 1/2", 1/4", 1/8" AND 1/32" VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 2 AND MAKING THE NUMERATOR 3. EXAMPLE: 3/16"=1'-0" AT (15"X21") PLOT = 3/32"=1'-0". ARCHITECTURAL 1/2", 1/4", 1/8" AND 1/32" VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 2 AND MAKING THE NUMERATOR 3 OVER EXAMPLE: 3/16"=1'-0" AT (15"X21") PLOT = 3/32"=1'-0". ARCHITECTURAL 1/2", 1/4", 1/8" AND 1/32" VIEW SCALES WILL BE 3/64"=1'-0" FOR SCALES AT 3/8", 3/16" AND 1/32". THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR ESSENTIALLY AND CHANGE THE NUMERATOR TO 1. EXAMPLE: 3/16"=1'-0" AT (15"X21") PLOT = 1/16"=1'-0". ARCHITECTURAL 1/2", 1/4", 1/8" AND 1/32" VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 2 AND MAKING THE NUMERATOR 3 OVER EXAMPLE: 3/16"=1'-0" AT (15"X21") PLOT = 3/32"=1'-0". ARCHITECTURAL 1/2", 1/4", 1/8" AND 1/32" VIEW SCALES WILL

7 DocuSign Envelope ID: C8BD1015-F028-4EE0-8907-8E18ED578887

GENERAL DEMO NOTES:

A. CONTRACTOR TO VERIFY IF EXISTING TERMINAL UNITS ARE SUITABLE FOR REUSE AND REPORT RESULTS TO THE DESIGN TEAM.
   a. PROVIDE PRECONSTRUCTION TESTING & BALANCING OF ALL TERMINAL UNITS WITHIN THE SCOPE OF WORK THAT ARE: EXISTING TO REMAIN, EXISTING TO BE RELOCATED, AND ARE BEING REBALANCED.
   b. CONFIRM DELTA-T ACROSS THE HEATING COIL, IF APPLICABLE.
   c. VISUALLY INSPECT COILS FOR CLEANLINESS.
   d. DETERMINE IF CONTROLS ARE FULLY OPERATIONAL.
   e. CONFIRM UNIT DOES NOT EMIT EXCESSIVE NOISE. IF TERMINAL UNIT IS NOT SUITABLE FOR REUSE, INFORM DESIGN TEAM AND REPLACE IN KIND.

B. THIS PROJECT INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. INFORMATION CONTAINED ON THIS DRAWING WAS OBTAINED FROM THE BEST AVAILABLE INFORMATION AND IS NOT INTENDED TO LIMIT THE SCOPE OF WORK.

C. CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTAL OF BID TO DETERMINE CONDITIONS AFFECTING THE EXECUTION OF THE WORK. AFTER VISITING THE SITE, REQUEST SUCH FURTHER INFORMATION AND/OR CLARIFICATION AS NECESSARY TO UNDERSTAND THE WORK REQUIRED AND TO PROPERLY ESTIMATE THE COST. CONTRACTORS, BY SUBMITTING A BID, ARE DEEMED TO BE COMPLETELY FAMILIAR WITH THE EXISTING CONDITION OF THE BUILDING AS IT INFLUENCES WORK DESCRIBED.

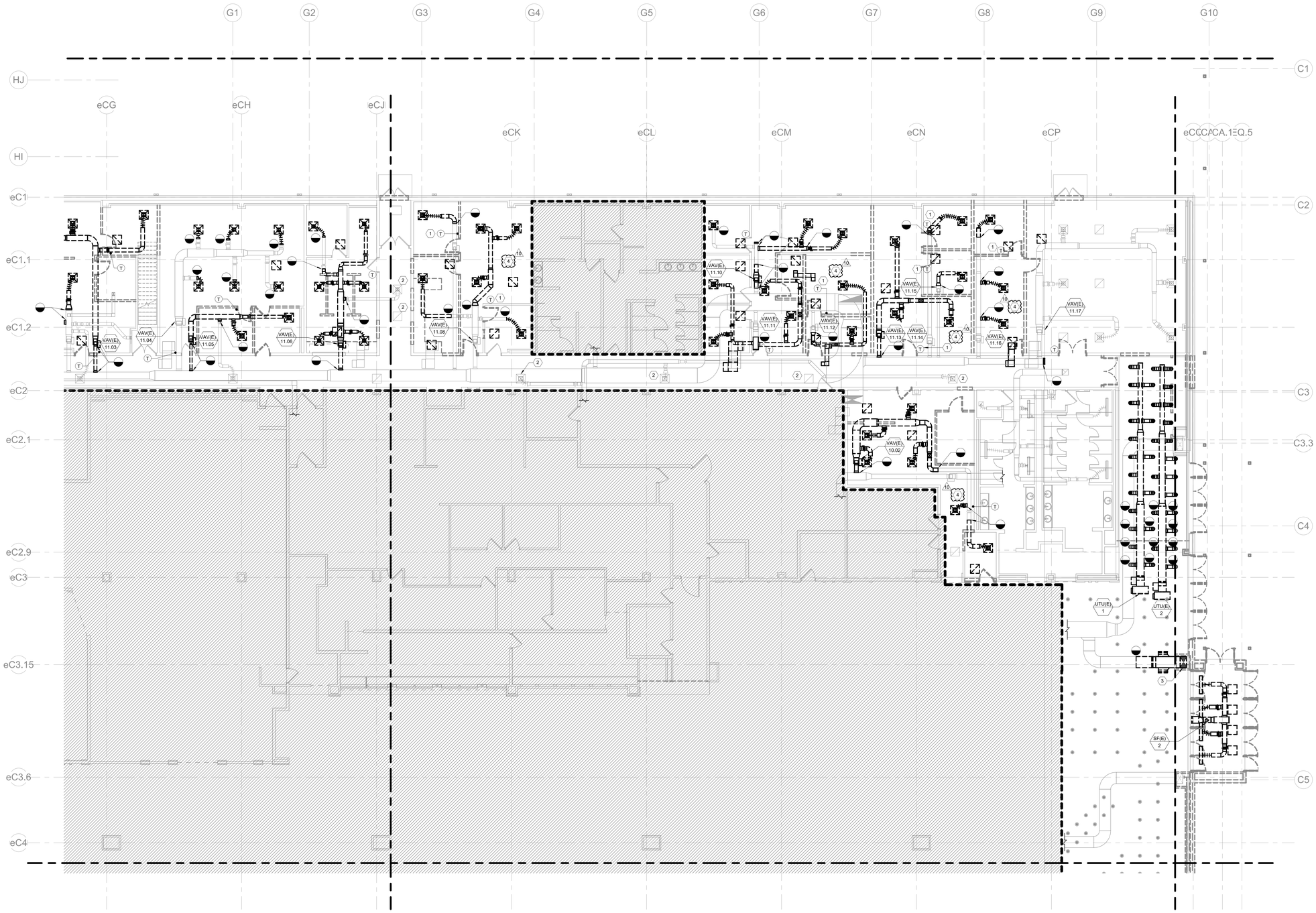
D. REMOVE AND LEGALLY DISPOSE OF ITEMS ASSOCIATED WITH THIS PROJECT AREA, UNLESS OTHERWISE NOTED. CONSTRUCTION MANAGER SHALL CLARIFY WITH OWNER ALL ITEMS THAT SHALL REMAIN THE PROPERTY OF THE OWNER PRIOR TO DISPOSAL. ITEMS TO BE SALVAGED MAY BE REMOVED FROM THE SITE AS WORK PROGRESSES. SALVAGED ITEMS MUST BE TRANSPORTED FROM THE SITE AS THEY ARE REMOVED.

E. DUCTWORK, INSULATION, OR EQUIPMENT TO REMAIN IS DAMAGED IN APPEARANCE OR IS UNSERVICEABLE, REMOVE DAMAGED OR UNSERVICEABLE PORTIONS AND REPLACE WITH NEW PRODUCTS OF EQUAL SIZE, CAPACITY, AND QUALITY.

F. DISCONNECT, DEMOLISH, AND REMOVE MECHANICAL SYSTEMS, EQUIPMENT, AND COMPONENTS INDICATED TO BE REMOVED.
   a. DUCTS TO BE REMOVED: REMOVE PORTION OF DUCTS INDICATED TO BE REMOVED AND CAP REMAINING DUCTS WITH SAME OR COMPATIBLE DUCTWORK MATERIAL AS REQUIRED. REFER TO ARCHITECTS PLAN/SPEC FOR WALL PATCHING
   b. EQUIPMENT TO BE REMOVED: DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT. EQUIPMENT SHALL BE REMOVED FROM THE PREMISES AND LEGALLY DISPOSED OF.
   c. EQUIPMENT/DEVICES TO BE RELOCATED AND REINSTALLED: DISCONNECT AND CAP SERVICES AND REMOVE, CLEAN, AND STORE EQUIPMENT/DEVICES; WHEN APPROPRIATE REINSTALL, RECONNECT, AND MAKE EQUIPMENT/DEVICES OPERATIONAL.
   d. EQUIPMENT TO BE REMOVED AND SALVAGED: DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT AND DELIVER TO OWNER. COORDINATE WITH OWNER PRIOR TO DEMOLITION WORK COMMENCES REGARDING ANY ITEMS TO BE TURNED OVER TO THE OWNER.

KEYNOTES:

1. RELOCATE EXISTING THERMOSTAT, SEE MH SERIES PLANS FOR NEW LOCATION.
2. REMOVE EXISTING DIFFUSER AND PREPARE TO BE REINSTALLED IN NEW CEILING GRID.
3. RELOCATE EXISTING DUCT DROP AND ASSOCIATED GRILLES TO NEW CHASE LOCATION. SEE SHEET MH-111D FOR NEW LOCATION.
10
4. EXISTING DIFFUSERS AND GRILLES IN THIS AREA SHOWN TO BE DEMOLISHED CAN BE REUSED WHERE POSSIBLE. CONTRACTOR SHALL INSPECT EXISTING DIFFUSERS AND GRILLES TO VERIFY THEY ARE IN PROPER WORKING CONDITION. CLEAN TO LOOK NEW PRIOR TO REUSE AS PART OF RENOVATION.



1 HVAC DEMO - FIRST FLOOR LEVEL - AREA D
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

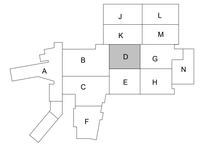
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KEY PLAN

BULLETIN 06
04/27/2023

NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER 039457 MECHANICAL
4/27/2023

ISSUE 01/31/2023
JOB 30611.00
DRAWN MWM
SCALE As indicated

REVISIONS
10 2023-0427 BULLETIN 06

HVAC DEMO - FIRST FLOOR LEVEL - AREA D

MD-111D

4/26/2023 12:15:54 PM
DRAWING PRINTED FULL SIZE (30"H) - IF NOT DRAWING PRINTED ON A 30" SIZE (30"H) WILL BE SMALLER THAN SHOWN - IF 24" OR 8.5X11" PRINTED WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED SCALE: 1" = 1'-0" THIS INDICATOR IS 1 INCH (1") ON THIS SHEET. IF THIS 1" DOES NOT MEASURE 1" ON A PRINTED DRAWING THE NUMERATOR IS 1 FOR EXAMPLE, 1-1/4"=1'-0" (125%) WILL BE 1.04"=1'-0" FOR SCALES AT 24" X 36" AND 30" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1/32ND'S (.041"=1'-0" AT 125%) WILL BE RAISED TO .041"=1'-0"

7 DocuSign Envelope ID: 31C67779-8015-4E11-8D69-F10DFA204BA4

GENERAL DEMO NOTES:

A. CONTRACTOR TO VERIFY IF EXISTING TERMINAL UNITS ARE SUITABLE FOR REUSE AND REPORT RESULTS TO THE DESIGN TEAM
   a. PROVIDE PRECONSTRUCTION TESTING & BALANCING OF ALL TERMINAL UNITS WITHIN THE SCOPE OF WORK THAT ARE EXISTING TO REMAIN, EXISTING TO BE RELOCATED, AND ARE BEING REBALANCED.
   b. CONFIRM DELTA-T ACROSS THE HEATING COIL, IF APPLICABLE.
   c. VISUALLY INSPECT COILS FOR CLEANLINESS.
   d. DETERMINE IF CONTROLS ARE FULLY OPERATIONAL.
   e. CONFIRM UNIT DOES NOT EMIT EXCESSIVE NOISE. IF TERMINAL UNIT IS NOT SUITABLE FOR REUSE, INFORM DESIGN TEAM AND REPLACE IN KIND.

B. THIS PROJECT INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. INFORMATION CONTAINED ON THIS DRAWING WAS OBTAINED FROM THE BEST AVAILABLE INFORMATION AND IS NOT INTENDED TO LIMIT THE SCOPE OF WORK.

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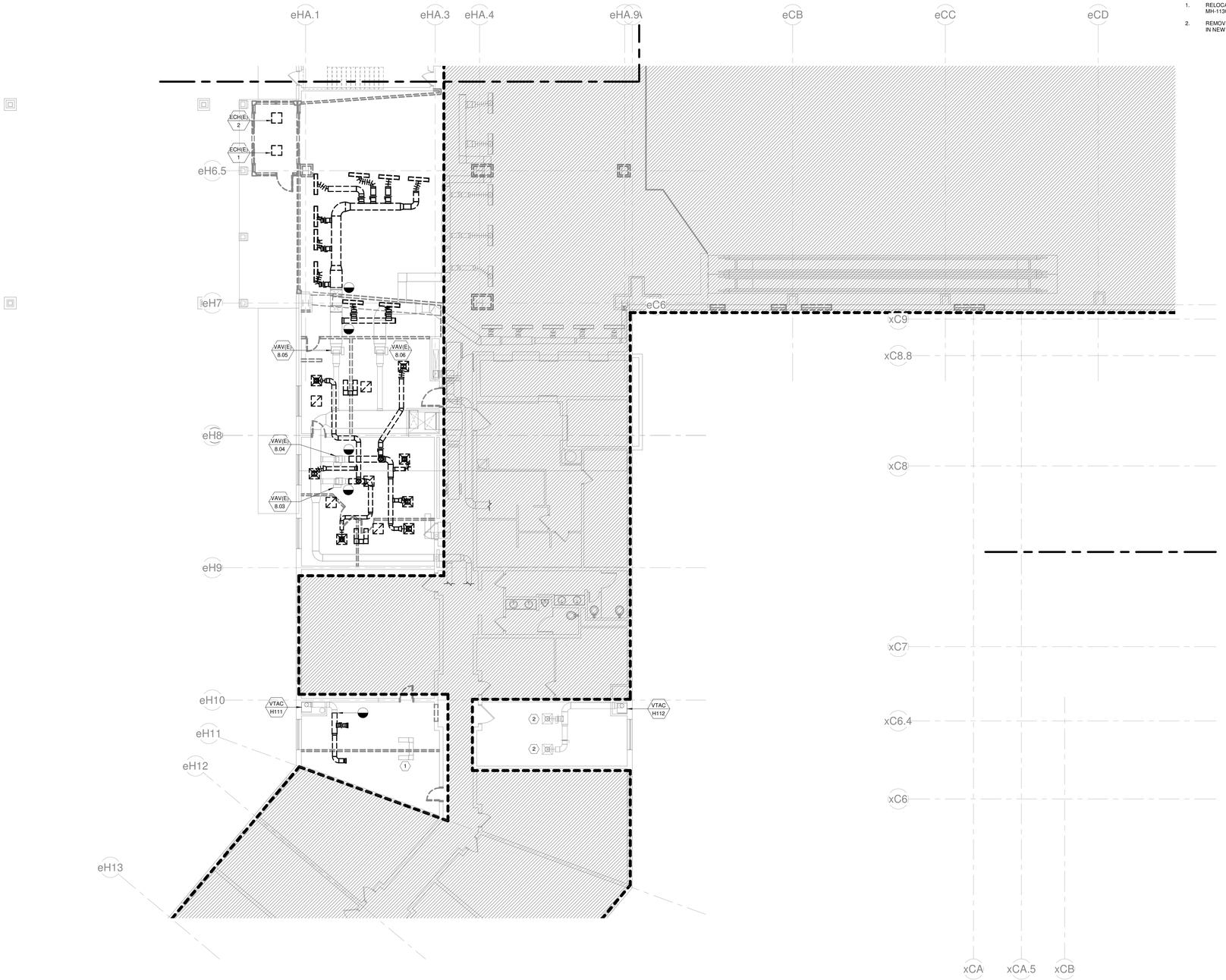
D. REMOVE AND LEGALLY DISPOSE OF ITEMS ASSOCIATED WITH THIS PROJECT AREA, UNLESS OTHERWISE NOTED. CONSTRUCTION MANAGER SHALL CLARIFY WITH OWNER ALL ITEMS THAT SHALL REMAIN THE PROPERTY OF THE OWNER PRIOR TO DISPOSAL. ITEMS TO BE SALVAGED MAY BE REMOVED FROM THE SITE AS WORK PROGRESSES. SALVAGED ITEMS MUST BE TRANSPORTED FROM THE SITE AS THEY ARE REMOVED.

E. DUCTWORK, INSULATION, OR EQUIPMENT TO REMAIN IS DAMAGED IN APPEARANCE OR IS UNSERVICEABLE, REMOVE DAMAGED OR UNSERVICEABLE PORTIONS AND REPLACE WITH NEW PRODUCTS OF EQUAL SIZE, CAPACITY, AND QUALITY.

F. DISCONNECT, DEMOLISH, AND REMOVE MECHANICAL SYSTEMS, EQUIPMENT, AND COMPONENTS INDICATED TO BE REMOVED.
   a. DUCTS TO BE REMOVED: REMOVE PORTION OF DUCTS INDICATED TO BE REMOVED AND CAP REMAINING DUCTS WITH SAME OR COMPATIBLE DUCTWORK MATERIAL AS REQUIRED. REFER TO ARCHITECTS PLAN/SPEC FOR WALL PATCHING
   b. EQUIPMENT TO BE REMOVED: DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT. EQUIPMENT SHALL BE REMOVED FROM THE PREMISES AND LEGALLY DISPOSED OF.
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   d. EQUIPMENT TO BE REMOVED AND SALVAGED: DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT AND DELIVER TO OWNER. COORDINATE WITH OWNER PRIOR TO DEMOLITION WORK COMMENCES REGARDING ANY ITEMS TO BE TURNED OVER TO THE OWNER.

KEYNOTES:

1. RELOCATE EXISTING TRANSFER DUCT, REFER TO DRAWING MH-113C FOR NEW LOCATION.
2. REMOVE EXISTING DIFFUSER AND PREPARE TO BE REINSTALLED IN NEW CEILING GRID.



1 HVAC DEMO - THIRD FLOOR LEVEL - AREA C
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

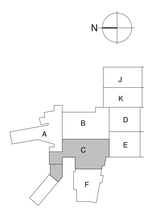
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KEY PLAN

PERMIT SET
01/31/2023



1/30/2023

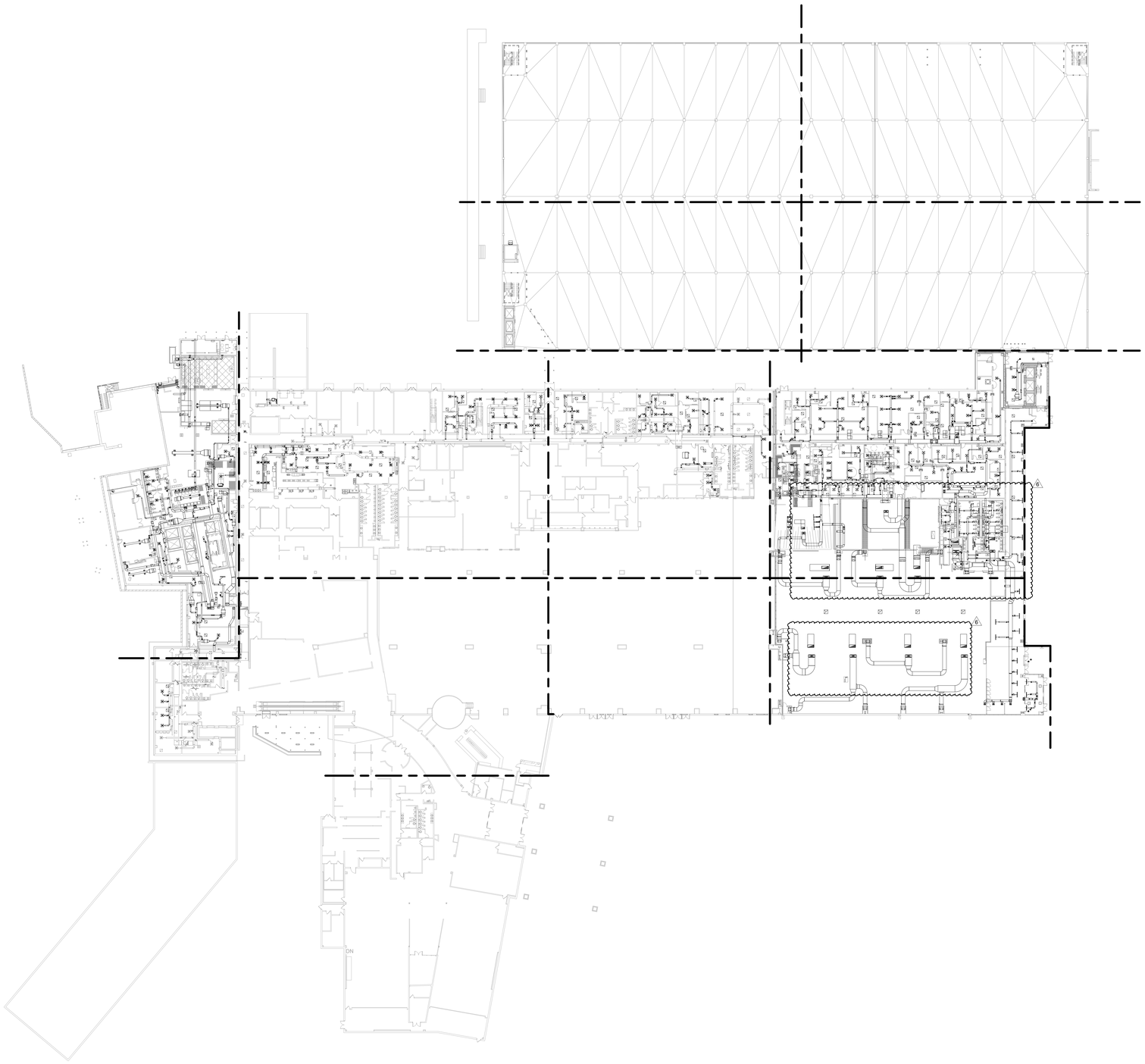
ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	As indicated
REVISIONS	

HVAC DEMO - THIRD FLOOR LEVEL - AREA C

MD-113C

1/30/2023 11:22:56 AM DRAWING PRINTED FULL SIZE (36"h) + (R)"x(R)". DRAWING PRINTED HALF SIZE (18"h) WILL FIT ON A SHEET 18"W HIGH. IT IS OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED REDUCED THIRD SIZE (12"h) + 11.25"x 0.5" WILL FIT EIGHTS ON 11"x17". INDIVIDUAL 12", 24", 36", 5/8" AND 1/32" HIGH SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 8 AND MARKING THE NUMERATOR TO 1. EXAMPLE: 3/8"=1'-0" AT (1/3) WILL BE MARKED TO 1/4"=1'-0".

DRAWING PRINTED FULL SIZE (30in) - IF NOT 24inx36in PRINTED HALF SIZE (15in) - IF ON A 8.5X11" SHEET "PLOT WITH 11" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED NEARLY THIS SIZE (3" FULL) = 11.25"x15.5" WILL FIT RIGHT ON 11"x17" INDIVIDUAL 12", 24", 36", 150" AND 432" VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 8 AND MAKING THE NUMERATOR 12'-1" EXAMPLE 3/8"=1'-0" (1/32") WILL BE 3/4"=1'-0" FOR SCALES AT 24", 36", 150" AND 432" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DIGITALLY AND CHANGE THE NUMERATOR TO 1. 1/32ABS 3/4"=1'-0" AT (1/32") WILL BE 9/64ABS 27/64"=1'-0" FOR SCALES AT 24", 36", 150" AND 432" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DIGITALLY AND CHANGE THE NUMERATOR TO 1. 1/32ABS 3/4"=1'-0" AT (1/32") WILL BE 3/64"=1'-0"



1 HVAC DUCTWORK - FIRST FLOOR LEVEL OVERALL
1/32" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

777 Casino Parkway
Murphy, NC 28906

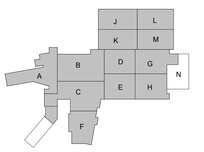
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KEY PLAN

BULLETIN 02
03/15/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	1/32" = 1'-0"

REVISIONS

6	2023-0315	BULLETIN 02

HVAC DUCTWORK - FIRST FLOOR LEVEL OVERALL

MH-111

3/14/2023 10:39:24 AM

GENERAL NOTES:

A. SEE PIPING PLANS FOR CONDENSATE AND VRF PIPING.

KEYNOTES:

1. EACH DRYER IS PROVIDED WITH INDIVIDUAL 4" VENT DUCT CONNECTED TO 12" VENT HEADER WITH SECONDARY LINT TRAP (EQUAL TO TJERNLUND MODEL LT4) MOUNTED AT 5'-0" ABOVE FINISH FLOOR TO CENTER OF LINT TRAP SUCH THAT IT IS VISIBLE ABOVE DRYER.
2. FAN TO BE INSTALLED ON SUSPENDED PLATFROM FROM STRUCTURE ABOVE PER MANUFACTURE'S INSTRUCTIONS. FINAL LOCATION OF FAN TO BE COORINDATED WITH STORAGE RACKS TO ENSURE NO OBSTRUCTIONS TO THE FAN OR THE STORAGE RACKS.
3. PROVIDE COMBINATION FIRE/SMOKE DAMPER RATED FOR MINIMUM 3 HR RATED WALL.
4. OPEN ENDED DUCT WITH ALUMINUM WIRE MESH SCREEN.
5. PROVIDE 12" HOOD WITH FLAPPER (EQUAL TO TJERNLUND MODEL P/N DEVH12) AND INSTALL PER MANUFACTURE'S INSTRUCTION. HOOD MUST BE MINIMUM 3'-0" FROM DOORS.
24 6. POOL EXHAUST DUCTWORK AND BALANCING DAMPERS SHALL BE OF ALUMINUM CONSTRUCTION.
7. PROVIDE MODULATING PRESSURE CONTROLLER (EQUAL TO TJERNLUND MPC) AND VARIABLE FREQUENCY DRIVE (EQUAL TO TJERNLUND VFD-1HP460MPC). COORDINATE LOCATION PRIOR TO INSTALLING PER MANUFACTURE'S INSTRUCTIONS. REFER TO HVAC CONTROLS ON DRAWING M813.
8. PROVIDE COMBINATION FIRE/SMOKE DAMPER RATED FOR 3 HR FIRE BARRIER.
9. OMNI TEMP REFRIGERATION RACK PROVIDED BY OTHERS. COORDINATE WITH ALL TRADES PRIOR TO FINALIZING LOCATION INCLUDING PLUMBING OVERFLOW DRAIN OUTLET, CLERANCES, AND ACCESSIBILITY TO THE EQUIPMENT.
10. ONE (1) EXTERIOR LOUVER DOOR FOR AIR INTAKE, PROVIDE MINIMUM 0.75 SF OF FREE AREA TO PROVIDE 365 CFM OF AIR INTAKE. REFER TO ARCHITECTURAL PLANS FOR DETAILS.
11. ONE (1) EXTERIOR LOUVER DOOR FOR AIR INTAKE, PROVIDE MINIMUM 0.4 SF OF FREE AREA TO PROVIDE 155 CFM OF AIR INTAKE. REFER TO ARCHITECTURAL PLANS FOR DETAILS.
12. CLEAN EXISTING DIFFUSER AND REINSTALL IN CEILING ALIGNED WITH NEW GRID. ADJUST EXISTING DUCTWORK AS REQUIRED TO INSTALL IN NEW CEILING. TYPICAL.
13. ROUTE FLUE VENT FROM POOL HEATER TO EXTERIOR WALL AS SHOWN. TERMINATE WITH SIDEWALL VENT TERMINATION PROVIDED WITH HEATER AS PART OF POWER SIDEWALL VENT KIT. VENT SHALL BE CONSTRUCTED OF DOUBLE WALL AL29-FC.
14. ROUTE COMBUSTION AIR DUCT FROM POOL HEATER TO EXTERIOR WALL AS SHOWN. TERMINATE WITH AIR INLET CAP PROVIDED WITH HEATER AS PART OF POWER SIDEWALL VENT KIT. COMBUSTION AIR DUCT SHALL BE CONSTRUCTED OF TYPE B DOUBLE WALL.
15. GAS-FIRED POOL HEATER. SEE AQUATIC DRAWINGS FOR SPECIFICATION AND LOCATION.
16. TWO (2) EXTERIOR LOUVER DOOR (ONE (1) PER EACH DOOR) FOR AIR INTAKE, PROVIDE MINIMUM 0.75 SF OF FREE AREA TO PROVIDE 370 CFM OF AIR INTAKE PER EACH LOUVER. REFER TO ARCHITECTURAL PLANS FOR DETAILS.
17. PROVIDE FIRE WRAP FOR DRYER VENT EXHAUST STARTING AT WHERE DUCT LEAVES FIRE RATED DRYER ROOM ALL THE WAY TO EXTERIOR TERMINATION.
18. INSTALL HEATER IN STAIRWELL 80" AFF.



1 HVAC DUCTWORK - FIRST FLOOR LEVEL - AREA A
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

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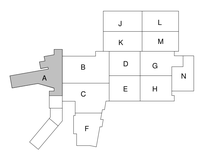
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KEY PLAN

BULLETIN 20
11/10/2023

PIC [PS] DL [CF]
PM [SP] DTL [KB]

ISSUE 01/31/2023
JOB 30611.00
DRAWN MWM
SCALE As indicated

REVISIONS

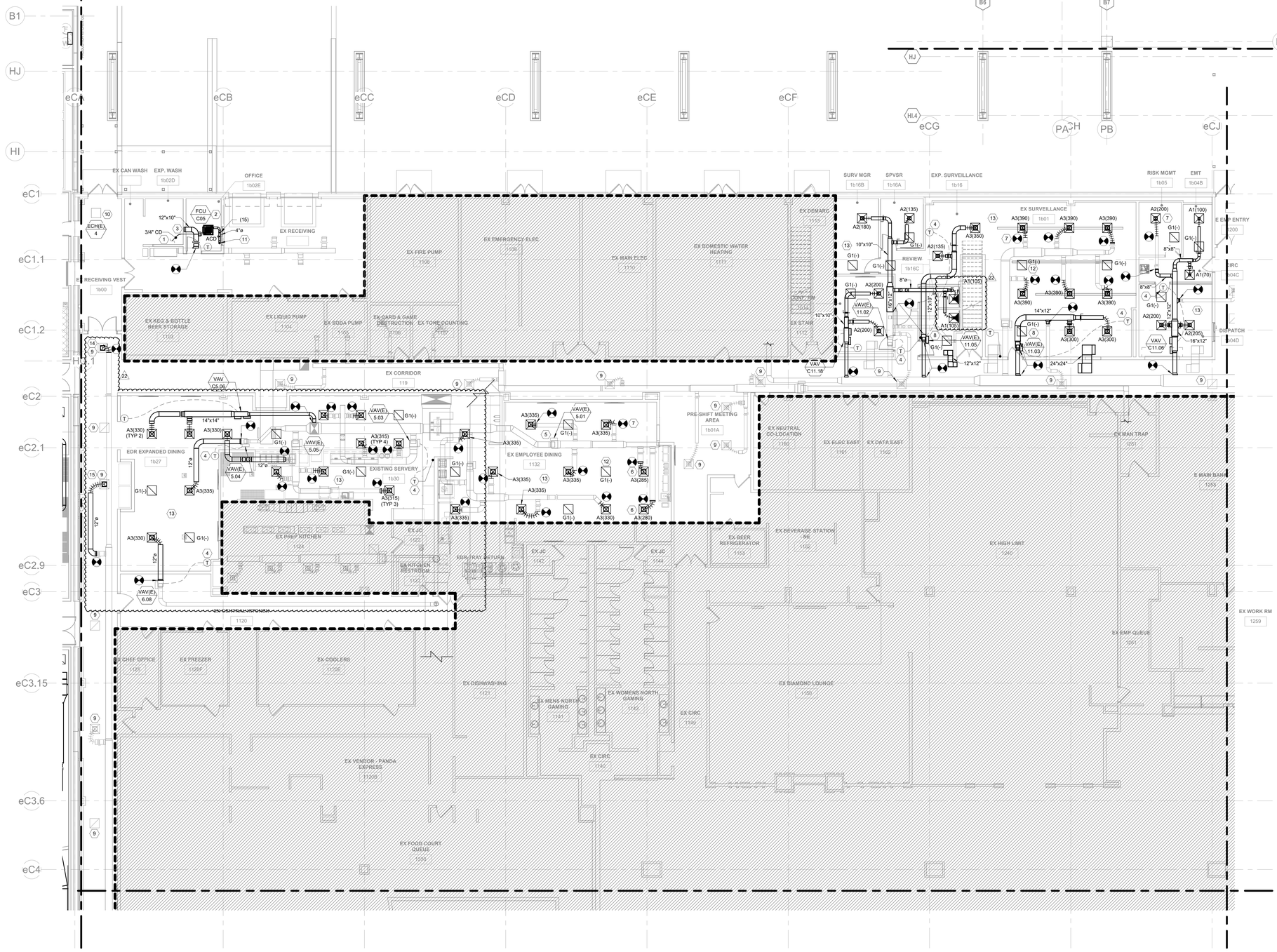
10	2023-0427	BULLETIN 06
19	2023-0913	BULLETIN 15
22	2023-0927	BULLETIN 18
24	2023-1110	BULLETIN 20

HVAC DUCTWORK - FIRST FLOOR LEVEL - AREA A

MH-111A

11/9/2023 8:51:39 AM
DRAWING PRINTED FULL SIZE (36"H) + 36"x36" DRAWING PRINTED HALF SIZE (18H) WILL FIT ON A SHEET 18"W/36"H WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED ON HALF SHEETS THROUGH 2ST (18"H) + 1.5"=19.5"X 8"=27.5" WILL FIT ON 24"X36" INDIVIDUAL 12", 24", 36", 9.5", AND 132" FOR SCALES ARE ALL THROUGH 8" AS THE ONE THE DRAWING FOR EXAMPLE, 3/8"=1'-0" AND 132" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. EXAMPLE 3/4"=1'-0" (375%) WILL BE 3/4"=1'-0" FOR SCALES AT 24", 3/8

770



1 HVAC DUCTWORK - FIRST FLOOR LEVEL - AREA B
1/8" = 1'-0"

GENERAL NOTES:

A. THIS AREA INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. INFORMATION CONTAINED ON THIS DRAWING WAS OBTAINED FROM THE BEST AVAILABLE INFORMATION AND IS NOT INTENDED TO LIMIT THE SCOPE OF THE WORK.

B. CONTRACTOR SHALL VISIT THE SITE PRIOR TO DETERMINE CONDITIONS AFFECTING THE EXECUTION OF THE WORK. AFTER VISITING THE SITE, REQUEST SUCH FURTHER INFORMATION AND/OR CLARIFICATION AS NECESSARY TO UNDERSTAND THE WORK REQUIRED AND TO PROPERLY ESTIMATE THE COST.

C. PIPING INCLUDED ON THIS SHEET DUE TO THE LIMITED PIPING SCOPE IN THIS AREA.

D. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING.

KEYNOTES:

1. ROUTE 3/4" CD FROM CONDENSATE PUMP AND CONNECT TO NEARBY EXISTING CONDENSATE DRAIN FROM EXISTING FCU.
2. ROUTE REFRIGERANT LINES FROM INDOOR UNIT TO OUTDOOR UNIT ON ROOF ABOVE. SIZE REFRIGERANT LINES PER MANUFACTURER REQUIREMENTS.
3. RELOCATE EXISTING SIDEWALL GRILLE TO THE LOCATION SHOWN AND MAINTAIN EXISTING BALANCING.
4. RELOCATE EXISTING THERMOSTAT TO THE LOCATION SHOWN. REWORK EXISTING CONTROL WIRING AS REQUIRED.
5. REBALANCE EXISTING VAV TO A MAXIMUM AIRFLOW OF 1570 CFM, ALL OTHER SETPOINTS SHALL REMAIN AT EXISTING VALUES.
6. REPLACE EXISTING DIFFUSERS WITH NEW AND CONNECT TO EXISTING DUCTWORK. ALIGN WITH NEW CEILING GRID AND BALANCE TO AIRFLOW SHOWN.
7. REPLACE EXISTING DIFFUSERS WITH NEW AND CONNECT TO EXISTING DUCTWORK. ALIGN WITH NEW CEILING GRID AND BALANCE TO MATCH EXISTING AIRFLOW. TYPICAL.
8. RELOCATE EXISTING VAV TO NEW LOCATION SHOWN. UNIT SHALL REMAIN BALANCED TO THE EXISTING AIRFLOWS.
9. CLEAN EXISTING DIFFUSER AND REINSTALL IN CEILING ALIGNED WITH NEW GRID AT NEW LOCATION SHOWN. ADJUST EXISTING DUCTWORK AS REQUIRED.
10. ALIGN EXISTING CEILING UNIT HEATER WITH NEW CEILING.
11. 4" OA DUCT UP THRU ROOF ABOVE. SEE ARCHITECTURE PLANS FOR EXISTING ROOF PENETRATION REQUIREMENTS. BALANCE OA DUCT TO 15 CFM.
12. REPLACE EXISTING GRILLES WITH NEW. ALIGN WITH NEW CEILING GRID. TYPICAL.
13. PROPERLY WORKING AND CLEANED EXISTING DIFFUSER/GRILLES IN THIS AREA CAN BE IN USED IN PLACE OF NEW DIFFUSERS SHOWN. EXISTING DIFFUSERS TO BE REUSED SHALL BE EQUIVALENT TO NEW DIFFUSERS SHOWN. ROOMS SHALL HAVE EITHER ALL NEW OR EXISTING DIFFUSER/GRILLES TO PROVIDE A CONSISTENT LOOK.
14. REBALANCE EXISTING DIFFUSER TO 225 CFM.
15. REBALANCE EXISTING DIFFUSER TO 390 CFM.

Additions and Renovations to Harrah's Cherokee Valley River

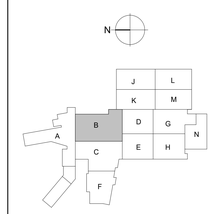
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KEY PLAN

BULLETIN 18
09/27/2023

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DRAWN MWM
SCALE As indicated

REVISIONS

10 2023-0427 BULLETIN 06
22 2023-0927 BULLETIN 18

HVAC DUCTWORK - FIRST FLOOR LEVEL - AREA B

MH-111B

DRAWING PRINTED FULL SIZE (100%) 24"x36" DRAWING PRINTED HALF SIZE (50%) WILL FIT ON A SHEET 36"x24" WITH 1/2" OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED HALF AGAIN AT 150% WILL FIT ON A SHEET 36"x24" WITH 1" OF EXTRA SPACE ON ALL FOUR SIDES
9/26/2023 8:54:43 AM

7 DocuSign Envelope ID: C8BD1015-F028-4EE0-8907-8E18ED578887

GENERAL NOTES:

A. THIS AREA INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. INFORMATION CONTAINED ON THIS DRAWING WAS OBTAINED FROM THE BEST AVAILABLE INFORMATION AND IS NOT INTENDED TO LIMIT THE SCOPE OF THE WORK.

B. CONTRACTOR SHALL VISIT THE SITE PRIOR TO DETERMINE CONDITIONS AFFECTING THE EXECUTION OF THE WORK. AFTER VISITING THE SITE, REQUEST SUCH FURTHER INFORMATION AND/OR CLARIFICATION AS NECESSARY TO UNDERSTAND THE WORK REQUIRED AND TO PROPERLY ESTIMATE THE COST.

KEYNOTES:

1. CLEAN EXISTING DIFFUSER AND REINSTALL IN CEILING ALIGNED WITH NEW GRID. ADJUST EXISTING DUCTWORK AS REQUIRED TO INSTALL IN NEW CEILING.
2. REBALANCE EXISTING VAV MAXIMUM AIRFLOW TO 960 CFM, MINIMUM AIRFLOW TO 285, HEATING AIRFLOW TO 480 CFM.
3. EXISTING CONDENSING UNIT TO REMAIN.
4. PROVIDE SINGLE CONTROLLER EQUAL TO MODEL PASCR165 FOR THE CONTROL OF ALL SIX PATIO HEATERS. PROVIDE CONTROLLER WITH NEMA 3 OUTDOOR RATED ENCLOSURE.
5. INSTALL UNIT A MINIMUM OF 9'-3" ABOVE GRADE. COORDINATE MOUNTING HEIGHT WITH ARCHITECT.
6. CEILING FAN BY OTHERS.
10 7. PROPERLY WORKING AND CLEANED EXISTING DIFFUSER/GRILLES IN THIS AREA CAN BE IN USED IN PLACE OF NEW DIFFUSERS SHOWN. EXISTING DIFFUSERS TO BE REUSED SHALL BE EQUIVALENT TO NEW DIFFUSERS SHOWN. ROOMS SHALL HAVE EITHER ALL NEW OR EXISTING DIFFUSER/GRILLES TO PROVIDE A CONSISTENT LOOK.

1 HVAC DUCTWORK - FIRST FLOOR LEVEL - AREA C
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

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KEY PLAN

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NORTH CAROLINA PROFESSIONAL 039457 ENGINEER
4/27/2023

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SCALE	As indicated

REVISIONS

10	2023-0427	BULLETIN 06

HVAC DUCTWORK - FIRST FLOOR LEVEL - AREA C

MH-111C

4/26/2023 12:16:28 PM DRAWING PRINTED FULL SIZE (30"H) = 24"x36" DRAWING PRINTED HALF SIZE (15"H) WILL FIT ON A SHEET TROUT PAPER = 11"x17" FOR SCALES AT 24"-36" 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR ESQUIVALENT AND CHANGE THE NUMERATOR TO 1. EXAMPLE 3/16"=1'-0" AT 24"x36" WILL BE 3/48"=1'-0" FOR SCALES AT 24"-36" 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. EXAMPLE 3/16"=1'-0" AT 24"x36" WILL BE 3/48"=1'-0" FOR SCALES AT 24"-36" 3/16" AND 3/32" FOR SCALES AT 24"-36" 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. EXAMPLE 3/16"=1'-0" AT 24"x36" WILL BE 3/48"=1'-0" FOR SCALES AT 24"-36" 3/16" AND 3/32" DRAWING PRINTED HALF SIZE (15"H) = 12"x18" DRAWING PRINTED HALF SIZE (15"H) WILL FIT ON A SHEET TROUT PAPER = 11"x17" FOR SCALES AT 24"-36" 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. EXAMPLE 3/16"=1'-0" AT 24"x36" WILL BE 3/48"=1'-0

GENERAL NOTES:

A. THIS AREA INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. INFORMATION CONTAINED ON THIS DRAWING WAS OBTAINED FROM THE BEST AVAILABLE INFORMATION AND IS NOT INTENDED TO LIMIT THE SCOPE OF THE WORK.

B. CONTRACTOR SHALL VISIT THE SITE PRIOR TO DETERMINE CONDITIONS AFFECTING THE EXECUTION OF THE WORK. AFTER VISITING THE SITE, REQUEST SUCH FURTHER INFORMATION AND/OR CLARIFICATION AS NECESSARY TO UNDERSTAND THE WORK REQUIRED AND TO PROPERLY ESTIMATE THE COST.

C. PIPING INCLUDED ON THIS SHEET DUE TO THE LIMITED PIPING SCOPE IN THIS AREA.

D. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING.

KEYNOTES:

1. ROUTE 3/4" CD FROM CONDENSATE PUMP AND ROUTE TO EXISTING JANITORS CLOSET MOP SINK.
2. ROUTE REFRIGERANT LINES FROM INDOOR UNIT TO OUTDOOR UNIT ON ROOF ABOVE. SIZE REFRIGERANT LINES PER MANUFACTURER REQUIREMENTS.
3. RELOCATE EXISTING THERMOSTAT TO THE LOCATION SHOWN. REWORK EXISTING CONTROL WIRING AS REQUIRED.
4. DUMP CONDENSATE TO EXISTING MOP SINK.
5. IDU WITH HUMIDIFICATION, SEE PLUMBING DRAWINGS FOR WATER CONNECTION. UNIT INCLUDES INTEGRAL SUPPLY AND RETURN GRILLES, INSTALL WITHIN CEILING GRID.
6. NOT USED.
7. NOT USED.
8. CLEAN EXISTING DIFFUSER AND REINSTALL IN CEILING ALIGNED WITH NEW GRID. ADJUST EXISTING DUCTWORK AS REQUIRED TO INSTALL IN NEW CEILING. TYPICAL.
9. EXISTING VAV-11.42. REBALANCE EXISTING VAV TO A MAXIMUM AIRFLOW OF 290 CFM. ALL OTHER SETPOINTS SHALL REMAIN AT EXISTING VALUES. 22
10. REBALANCE EXISTING DAMPERS AS REQUIRED TO MAINTAIN EXISTING AIRFLOW WITH NEW CONNECTION TO SYSTEM.
11. RELOCATE EXISTING DUCT DROP AND ASSOCIATED GRILLES TO NEW CHASE LOCATION. EXTEND EXISTING SUPPLY DUCTWORK TO THE NEW LOCATION.
12. PROPERLY WORKING AND CLEANED EXISTING DIFFUSER/GRILLES IN THIS AREA CAN BE IN USED IN PLACE OF NEW DIFFUSERS SHOWN. EXISTING DIFFUSERS TO BE REUSED SHALL BE EQUIVALENT TO NEW DIFFUSERS SHOWN. ROOMS SHALL HAVE EITHER ALL NEW OR EXISTING DIFFUSER/GRILLES TO PROVIDE A CONSISTENT LOOK.

22 13. EXISTING VAV-11.11. REBALANCE EXISTING VAV TO A MAXIMUM AIRFLOW OF 735 CFM. ALL OTHER SETPOINTS SHALL REMAIN AT EXISTING VALUES.

1 HVAC DUCTWORK - FIRST FLOOR LEVEL - AREA D
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

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KEY PLAN

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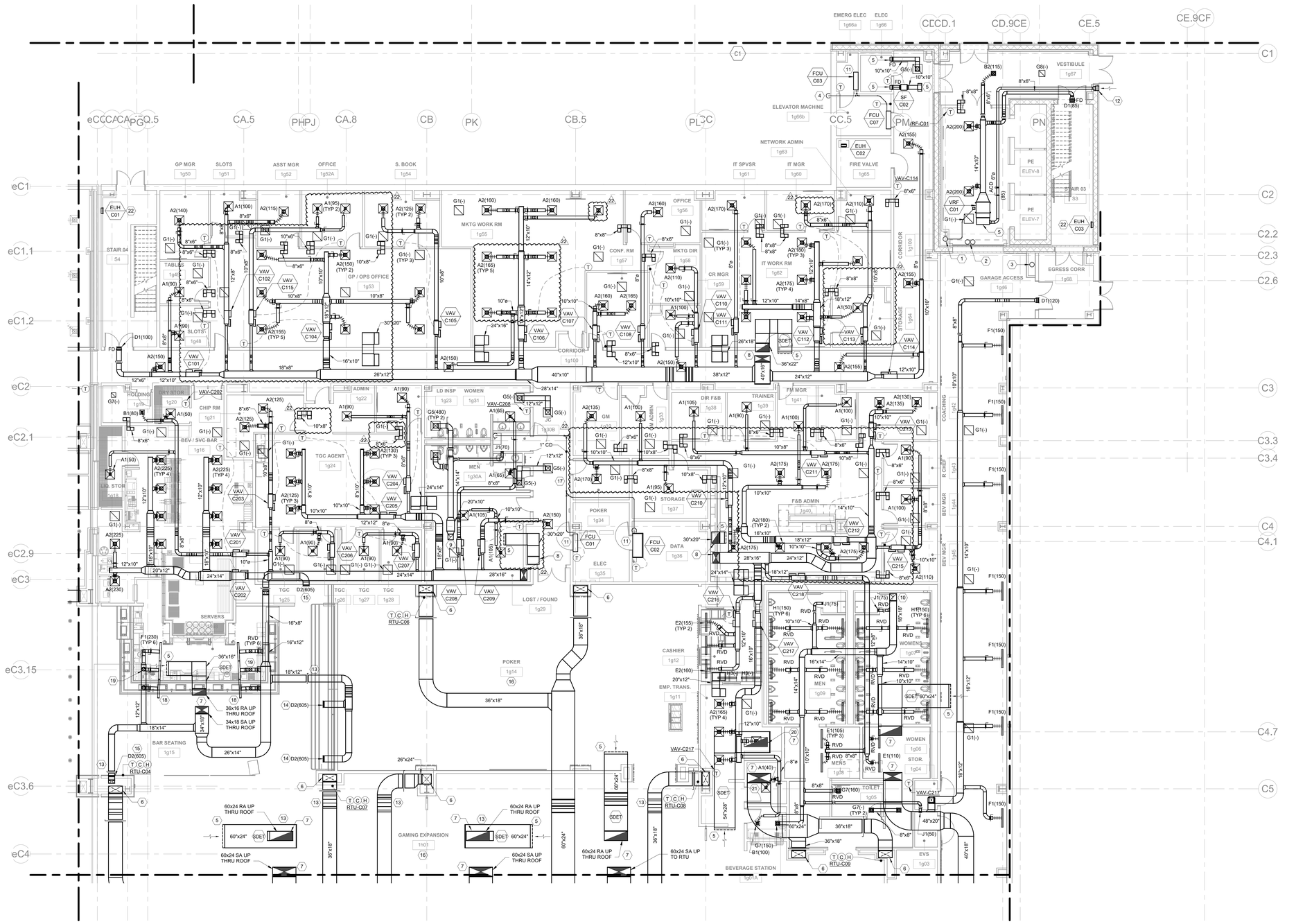
REVISIONS

10 2023-0427 BULLETIN 06
22 2023-0927 BULLETIN 18

HVAC DUCTWORK - FIRST FLOOR LEVEL - AREA D

MH-111D

DRAWING PRINTED FULL SIZE (30"x42") • IF NOT DRAWING PRINTED HALF SIZE (15"x21") ON A3 SHEET • IF NOT 1.0" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED MANALY THREE SIZE (15"x11") • 11"(H)X15.75" WILL FIT TIGHTLY ON 11"x17" • REGIONAL 12" - 14" - 16" - 18" AND 120" VIEW SCALES WILL TYPICALLY BE USED ON THE DESIGNATION BY HASH MARKS THE NUMERATOR IS 1 FOR EXAMPLE 1.50"=1'-0" AT 22"(H) WILL BE SHOWN AT 75"=1'-0"
5/26/2023 8:54:49 AM



1 HVAC DUCTWORK - FIRST FLOOR LEVEL - AREA G
1/8" = 1'-0"

GENERAL NOTES:

A. PIPING INCLUDED ON THIS SHEET DUE TO THE LIMITED PIPING SCOPE IN THIS AREA.

B. VRF PIPING MAINS SHOWN FOR GENERAL INTENT AND ROUTING. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR COMPLETE PIPING DISTRIBUTION AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.

C. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE.

KEYNOTES:

1. ROUTE 3/4" CD FROM CONDENSATE PUMP UP TO ABOVE GARAGE ACCESS CEILING, SEE SHEET MH-112G FOR CONTINUATION.
2. VERTICAL VRF PIPING MAINS SHOWN FOR REFERENCE AND IS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER PIPING DISTRIBUTION BETWEEN ACCU AND VRF'S FOR FINAL ROUTING AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.
3. 1" CD DOWN FROM ABOVE TO PLUMBING OPEN ENDED DRAIN, SEE PLUMBING DRAWINGS FOR LOCATION.
4. ROUTE CONDENSATE DRAIN DOWN TO GRADE AND DUMP TO SPLASH BLOCK.
5. COVER OPEN-ENDED DUCT WITH WIRE MESH SCREEN.
6. SA DUCT DOWN TO UNDERFLOOR. SEE SHEET M-300 FOR CONTINUATION OF UNDERFLOOR SYSTEM.
7. SA AND RA DUCT UP TO RTU ON ROOF ABOVE. TRANSITION DUCT WITHIN CURB DUCT TO MATCH UNIT CONNECTION SIZE.
8. SA AND RA UP TO FLOOR ABOVE, SEE SHEET MH-112G FOR CONTINUATION.
9. 14"x14" EA UP TO FLOOR ABOVE, SEE SHEET MH-112G FOR CONTINUATION.
10. 18"x18" EA UP TO EF ON ROOF ABOVE.
11. ROUTE REFRIGERANT LINES FROM INDOOR UNIT TO OUTDOOR UNIT ON ROOF ABOVE. SIZE REFRIGERANT LINES PER MANUFACTURER REQUIREMENTS.
12. CONNECT OA INTAKE TO 12"x12" LOUVER. SEE ARCHITECTURE PLANS FOR LOCATION AND SPECIFICATIONS.
13. PROVIDE ALL EXPOSED DUCTWORK WITH BLACK COATED BLANKET INSULATION UNLESS OTHERWISE NOTED. MATCHING BLACK TAPE SHALL BE USED FOR A CONTINUOUS BLACK APPEARANCE.
14. LOCATE SUPPLY GRILLE DIRECTLY ABOVE THE EDGE OF CASEWORK ABOVE SEATING. SET GRILLE DEFLECTION 45 DEGREES DOWN TOWARDS FLOOR. GRILLE SHALL BE PAINT READY, COLOR TO BE SELECTED BY ARCHITECT
15. LOCATE SUPPLY GRILLE 14'-0" AFF. GRILLE SHALL BE PAINT READY, COLOR TO BE SELECTED BY ARCHITECT.
16. SEE SHEET M-300 FOR UNDERFLOOR GRILLE AND DUCT LAYOUT.
17. ROUTE CONDENSATE TO JANITORS CLOSET AND DUMP TO MOP SINK.
18. LOCATE CONTINUOUS SLOT DIFFUSERS IN BETWEEN CURVED CEILING SOFFITS ANGLED TO MATCH APPROXIMATE CEILING SLOPE. CONFIRM INSTALLED ANGLE WITH ARCHITECT. TYPICAL.
19. ROUTE DUCT DOWN THROUGH CEILING SOFFIT TO EXPOSED SLOT DIFFUSER. EXPOSED DUCT CONNECTION FROM SOFFIT TO DIFFUSER SHALL BE DOUBLE WALL AND PAINT READY. COLOR TO BE SELECTED BY ARCHITECT. TYPICAL.
20. 60x24 RA UP THRU ROOF.
21. 60x24 SA UP THRU ROOF.
22. INSTALL HEATER IN STAIRWELL 80" AFF.

Additions and Renovations to Harrah's Cherokee Valley River

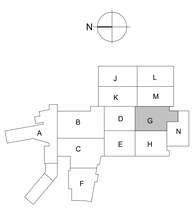
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KEY PLAN

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09/27/2023

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SCALE	As indicated

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10	2023-0427	BULLETIN 06
12	2023-0602	BULLETIN 10
22	2023-0927	BULLETIN 18

HVAC DUCTWORK - FIRST FLOOR LEVEL - AREA G

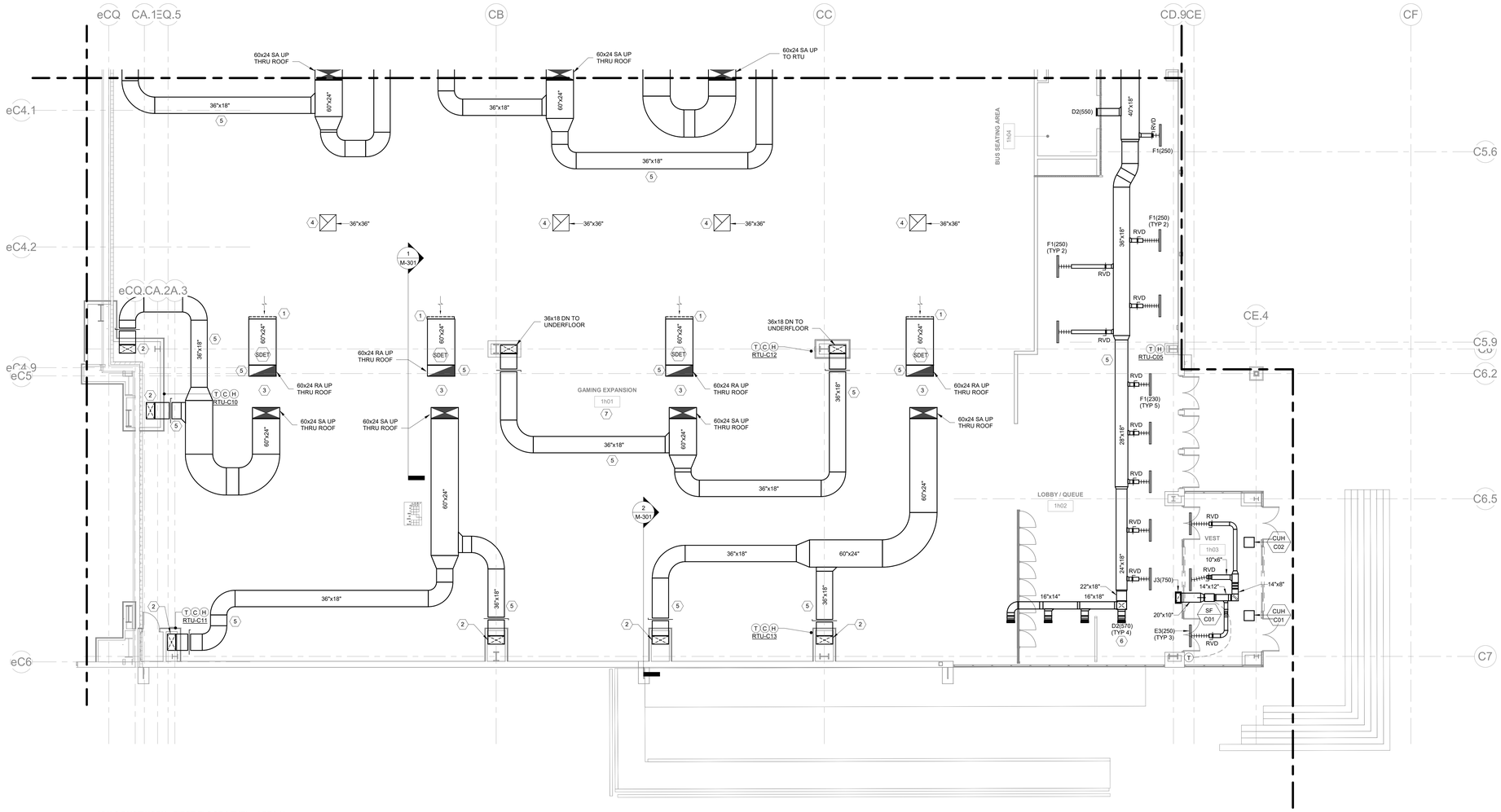
MH-111G

9/26/2023 6:54:56 AM
DRAWING PRINTED FULL SIZE (30IN.) - SHEET SIMMONS PRINTED HALF SIZE (15IN.) IF ON A SHEET SHEET WITH 1/2" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15IN.) IF ON A SHEET SHEET WITH 1" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15IN.) IF ON A SHEET SHEET WITH 1/2" OF EXTRA SPACE ON ALL FOUR SIDES. THIS DRAWING IS FULL SIZE (30IN.) IF ON A SHEET SHEET WITH 1" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15IN.) IF ON A SHEET SHEET WITH 1/2" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15

7 DocuSign Envelope ID: C8BD1015-F028-4EE0-8907-8E18ED578887

KEYNOTES:

1. COVER OPEN-ENDED DUCT WITH WIRE MESH SCREEN.
2. SA DUCT DOWN TO UNDERFLOOR. SEE SHEET M-300 FOR CONTINUATION OF UNDERFLOOR SYSTEM.
3. SA AND RA DUCT UP TO RTU ON ROOF ABOVE. TRANSITION DUCT WITHIN CURB TO MATCH UNIT CONNECTION SIZE.
4. 36"x36" EA UP TO EF ON ROOF ABOVE. COVER OPEN ENDED DUCT WITH WIRE MESH SCREEN.
5. PROVIDE ALL EXPOSED DUCTWORK WITH BLACK COATED BLANKET INSULATION UNLESS OTHERWISE NOTED. MATCHING BLACK TAPE SHALL BE USED FOR A CONTINUOUS BLACK APPEARANCE.
6. LOCATE SUPPLY GRILLE AT THE EXTENTS OF THE CLOUD CEILING. ANGLE GRILLE DOWN 30 DEGREES FROM HORIZONTAL. SET GRILLE DEFLECTION 45 DEGREES DOWN TOWARDS FLOOR. GRILLE SHALL BE PAINT READY, COLOR TO BE SELECTED BY ARCHITECT.
7. SEE SHEET M-300 FOR UNDERFLOOR GRILLE AND DUCT LAYOUT.



1 HVAC DUCTWORK - FIRST FLOOR LEVEL - AREA H
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

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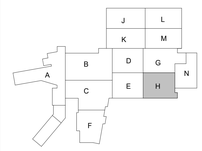
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KEY PLAN

BULLETIN 06
04/27/2023

NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER 039457 SEAL MECHANICAL
4/27/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	1/8" = 1'-0"

REVISIONS

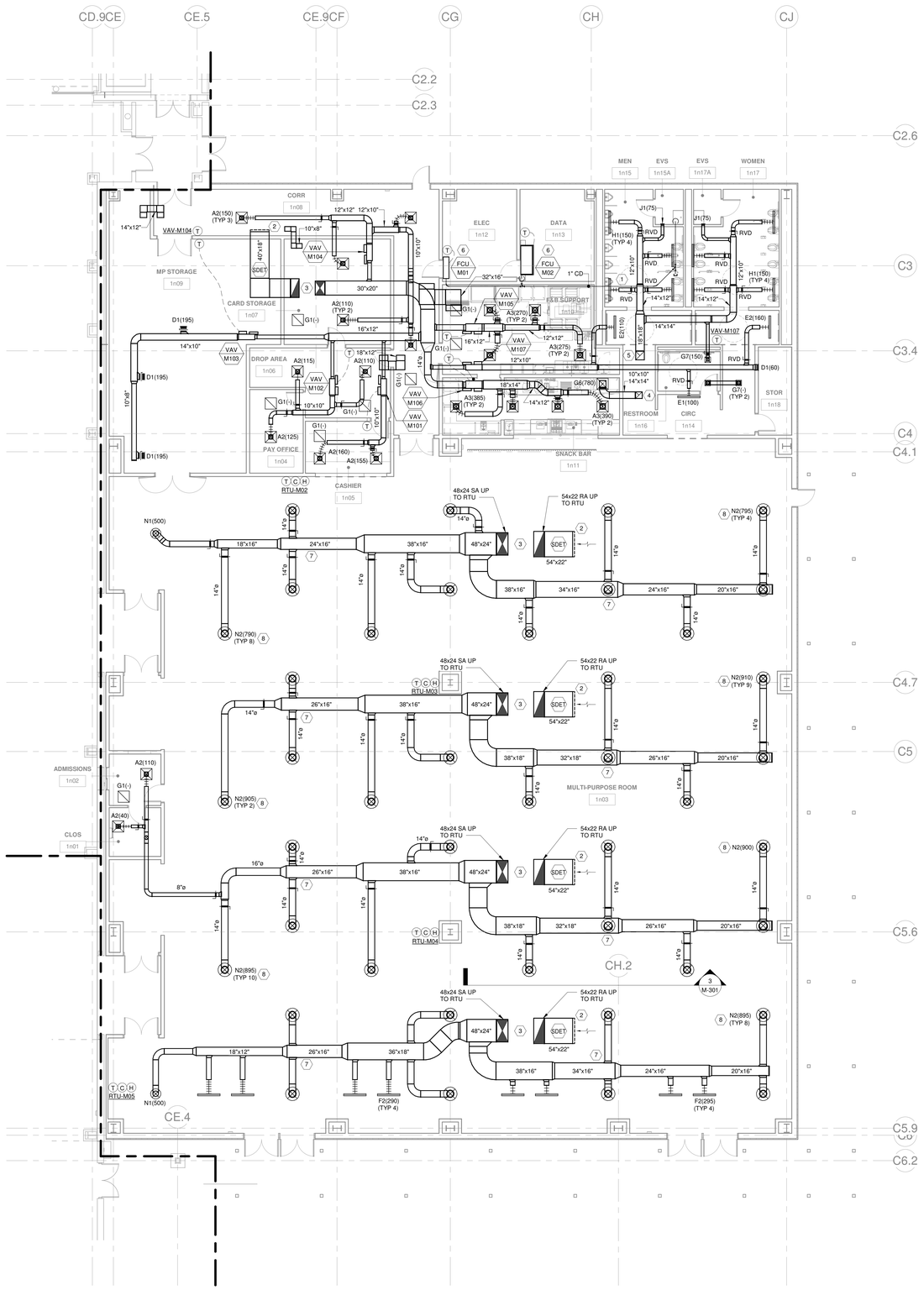
6	2023-0315	BULLETIN 02
10	2023-0427	BULLETIN 06

HVAC DUCTWORK - FIRST FLOOR LEVEL - AREA H

MH-111H

4/26/2023 12:16:46 PM
DRAWING PRINTED FULL SIZE (100%) - IF NOT 24X36INCH PRINTED HALF SIZE (50%) WILL FIT ON A SHEET 18"X24" WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED MAKE THREE SIZE (37.5%) - IT IS 24 X 37.5" WILL FIT TIGHTLY ON 24"x37". ARCHIVAL 22" x 34" - 1/8" AND 132" VIEW SCALES WILL THINGLIES BY MULTIPLYING THE DENOMINATOR TO 1. EXAMPLE 1/8"=1'-0" AT (1/8) WILL BE SCALED TO 1/8"=1'-0".

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1 HVAC DUCTWORK - FIRST FLOOR LEVEL - AREA N
1/8" = 1'-0"

GENERAL NOTES:

A. PIPING INCLUDED ON THIS SHEET DUE TO THE LIMITED PIPING SCOPE IN THIS AREA.

B. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE.

KEYNOTES:

1. ROUTE CONDENSATE TO JANITORS CLOSET AND DUMP TO MOP SINK.
2. COVER OPEN-ENDED DUCT WITH WIRE MESH SCREEN.
3. SA AND RA DUCT UP TO RTU ON ROOF ABOVE. TRANSITION DUCT TO MATCH UNIT CONNECTION SIZE.
4. 14"x14" EA UP TO EF ON ROOF ABOVE.
5. 18"x18" EA UP TO EF ON ROOF ABOVE.
6. ROUTE REFRIGERANT LINES FROM INDOOR UNIT TO OUTDOOR UNIT ON ROOF ABOVE. SIZE REFRIGERANT LINES PER MANUFACTURER REQUIREMENTS.
7. ALL EXPOSED PORTIONS OF DUCTWORK SHALL BE DOUBLE WALL FLANGED AND PAINT READY. PAINT COLOR TO BE SELECTED BY ARCHITECT.
8. LOCATE SUPPLY GRILLE EXPOSED BETWEEN CLOUD CEILINGS. MATCH CEILING ELEVATION. GRILLE SHALL BE PAINT READY. COLOR TO BE SELECTED BY ARCHITECT. TYPICAL.

Additions and Renovations to Harrah's Cherokee Valley River

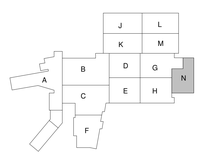
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KEY PLAN

PERMIT SET
01/31/2023



ISSUE	12/22/2022
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SCALE	As indicated
REVISIONS	

HVAC DUCTWORK - FIRST FLOOR LEVEL - AREA N - PHASE 2

MH-111N

1/30/2023 11:24:23 AM
DRAWING PRINTED FULL SIZE (1'=1") - IF 24"x36" DRAWING PRINTED HALF SIZE (0.5"=1") - IF 30"x42" DRAWING PRINTED HALF SIZE (0.5"=1") - IF 30" X 42" SHEET IS NOT WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES -

DRAWING PRINTED FULL SIZE (100%) = 36"x48" DRAWING PRINTED HALF SIZE (50%) WILL FIT ON A 24X36" (ARCH D) SHEET WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED MAINLY THREE SIZE (37.5%) = 11.25"x16.75" WILL FIT TIGHTLY ON A 11"x17" (ARCH B) SHEET. DRAWING PRINTED QUARTER SIZE (25%) = 9"x12" WILL FIT COMFORTABLY ON A 11"x17" (ARCH B) SHEET. DRAWING 1 FOR EXAMPLE 1 SAY = 4'-0" FOR SCALES AT 3/4", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR ESSENTIALLY AND CHANGE THE NUMERATOR TO 1. 1 SAMPLE SAY = 4'-0" AT 3/16" WILL BE SAMPLE TO

770

GENERAL NOTES:

A. SEE PIPING PLANS FOR CONDENSATE AND VRF PIPING.

KEYNOTES:

1. 36"x22" SUPPLY AND EXHAUST AIR UP TO THRID FLOOR.
2. INSTALL HEAVY DUTY ALUMINUM RETURN GRILLE (J6) AT 8'-0" ABOVE FINISHED FLOOR TO CENTER OF DIFFUSER.
3. PROVIDE FOUR (4) L1 DIFFUSERS AS SHOWN, DIFFUSER WILL BE USED AS RETURN AIRFLOW PATH FROM ROOM TO ABOVE CEILING FOR PLENUM RETURN. NO DUCT CONNECTED TO IT.
4. PROVIDE BIRD SCREEN COVERING OEPNING OF EXHAUST DUCT. EXHAUST DUCT SIZED AT 16"x16"



1 HVAC DUCTWORK - SECOND FLOOR LEVEL - AREA A
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

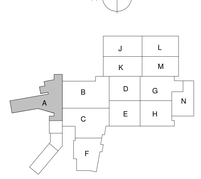
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KEY PLAN

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11/10/2023

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PM [SP] DTL [KB]

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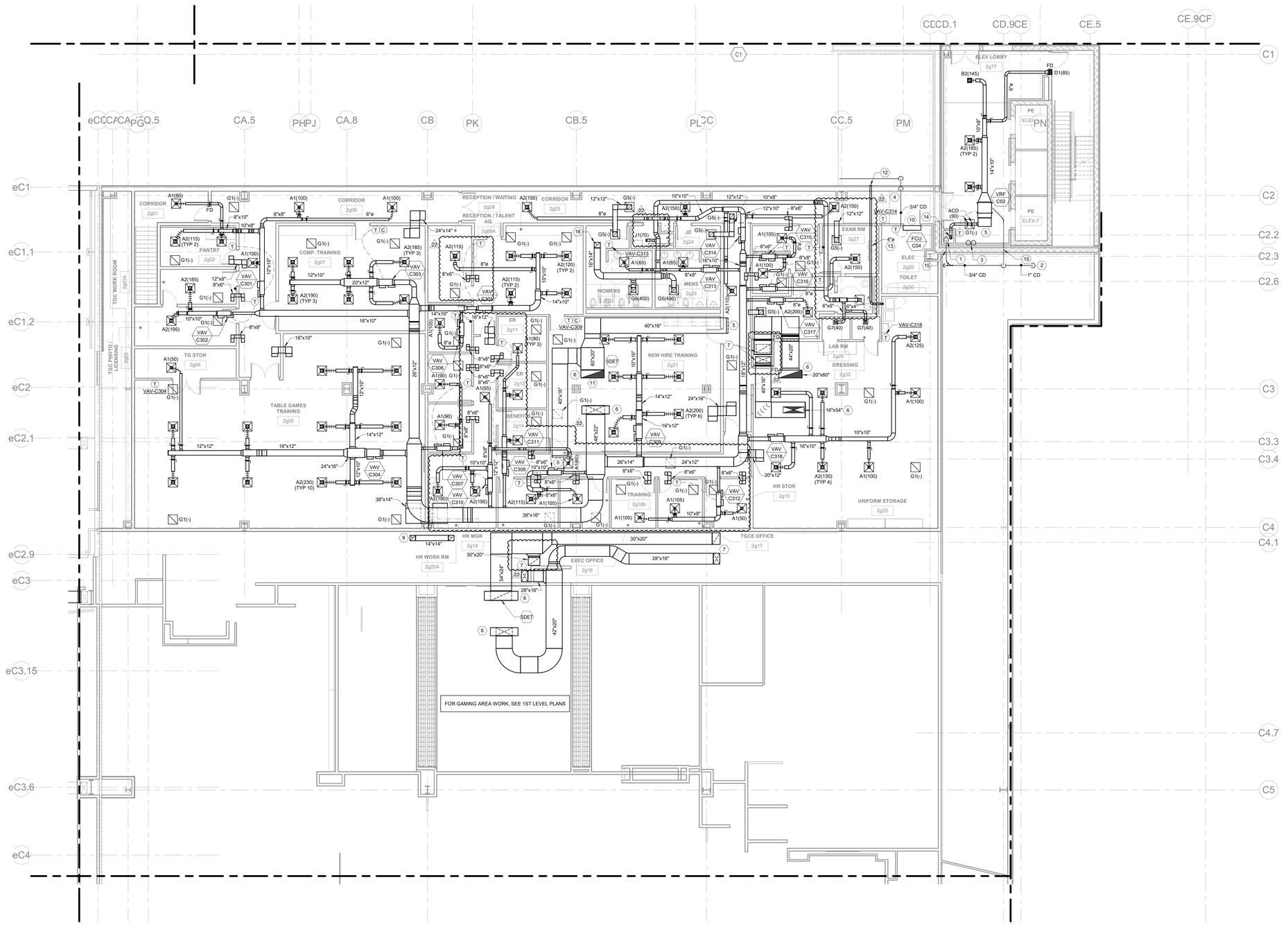
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10	2023-0427	BULLETIN 06
19	2023-0913	BULLETIN 15
22	2023-0927	BULLETIN 18
24	2023-1110	BULLETIN 20

HVAC DUCTWORK - SECOND FLOOR LEVEL - AREA A

MH-112A

11/9/2023 9:51:45 AM DRAWING PRINTED FULL SIZE (30"H) - 30"x42" DRAWING PRINTED HALF SIZE (15"H) - 15"x21" IF THIS BAR IS SHORTER THAN 2" - 30" x 42" DRAWING PRINTED HALF SIZE (15"H) - 15"x21" IF THIS BAR IS SHORTER THAN 1" - 30" x 42" DRAWING PRINTED HALF SIZE (15"H) - 15"x21" IF THIS BAR IS SHORTER THAN 1/2" - 30" x 42" (15"H) WILL BE SAM'=2" FOR SCALES AT 24" - 30" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE ENGINEARTOS CUSTOMARY AND CHANGE THE NUMERATOR TO 1. 3/32ARE 3/4"=1'-0" AT (15"H) WILL BE MARKED TO 1/4"=1'-0".

770



1 HVAC DUCTWORK - SECOND FLOOR LEVEL - AREA G
1/8" = 1'-0"

GENERAL NOTES:

A. PIPING INCLUDED ON THIS SHEET DUE TO THE LIMITED PIPING SCOPE IN THIS AREA.

B. VRF PIPING MAINS SHOWN FOR GENERAL INTENT AND ROUTING. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR COMPLETE PIPING DISTRIBUTION AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.

C. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE.

KEYNOTES:

1. 3/4" CD UP FROM BELOW. ROUTE ABOVE GARAGE ACCESS CEILING AS SHOWN.
2. ROUTE 1" CD DN THROUGH CHASE, SEE SHEET MH-111G FOR CONTINUATION.
3. VERTICAL VRF PIPING MAINS SHOWN FOR REFERENCE AND IS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER PIPING DISTRIBUTION BETWEEN ACCU AND VRF'S FOR FINAL ROUTING AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.
4. ROUTE CONDENSATE DRAIN DOWN TO ROOF BELOW AND OVER TO GUTTER.
5. COVER OPEN-ENDED DUCT WITH WIRE MESH SCREEN.
6. SA AND RA DUCT UP TO RTU ON ROOF ABOVE. TRANSITION DUCT WITHIN CURB TO MATCH UNIT CONNECTION SIZE.
7. SA AND RA DN TO BELOW, SEE SHEET MH-111G FOR CONTINUATION.
8. SA AND RA DUCT UP TO ROOF, SEE SHEET MH-113G FOR CONTINUATION.
9. 14"x14" EA UP TO EF ON ROOF ABOVE.
10. ROUTE REFRIGERANT LINES FROM INDOOR UNIT TO OUTDOOR UNIT ON ROOF ABOVE. SIZE REFRIGERANT LINES PER MANUFACTURER REQUIREMENTS.
11. INTERNALLY LINE RETURN DUCT WITH 1" ACOUSTICAL LINING.
12. ROUTE 4" RIGID DRYER DUCT TO EXTERIOR WALL WITH VENT HOOD. NO SCREEN OR GRATE OF ANY SIZE SHALL COVER EXHAUST OPENING.
13. DRYER VENTING BASED ON ELECTROLUX MODEL EFME427UIW DRYER WITH ALLOWABLE 4" VENT LENGTH OF 95 FT WITH 3 ELBOWS. VENT ROUTING HAS 3 ELBOWS AND 35 FT OF LENGTH WHICH IS WITHIN ALLOWABLE DISTANCE FOR DRYER. VERIFY WITH INSTALLED DRYER THAT VENTING IS WITHIN LIMITS. NOTIFY ENGINEER IF VENTING EXCEEDS LIMITS.
14. 6" OA UP TO FLOOR ABOVE, SEE SHEET MH-113G FOR CONTINUATION.
15. FIRE CAULK ALL PIPE PENETRATIONS THROUGH 3-HR RATED WALL.
16. 16"x14" EA UP TO EF ON ROOF ABOVE.

Additions and Renovations to Harrah's Cherokee Valley River

777 Casino Parkway
Murphy, NC 28906

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KEY PLAN

BULLETIN 18
09/27/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	As indicated

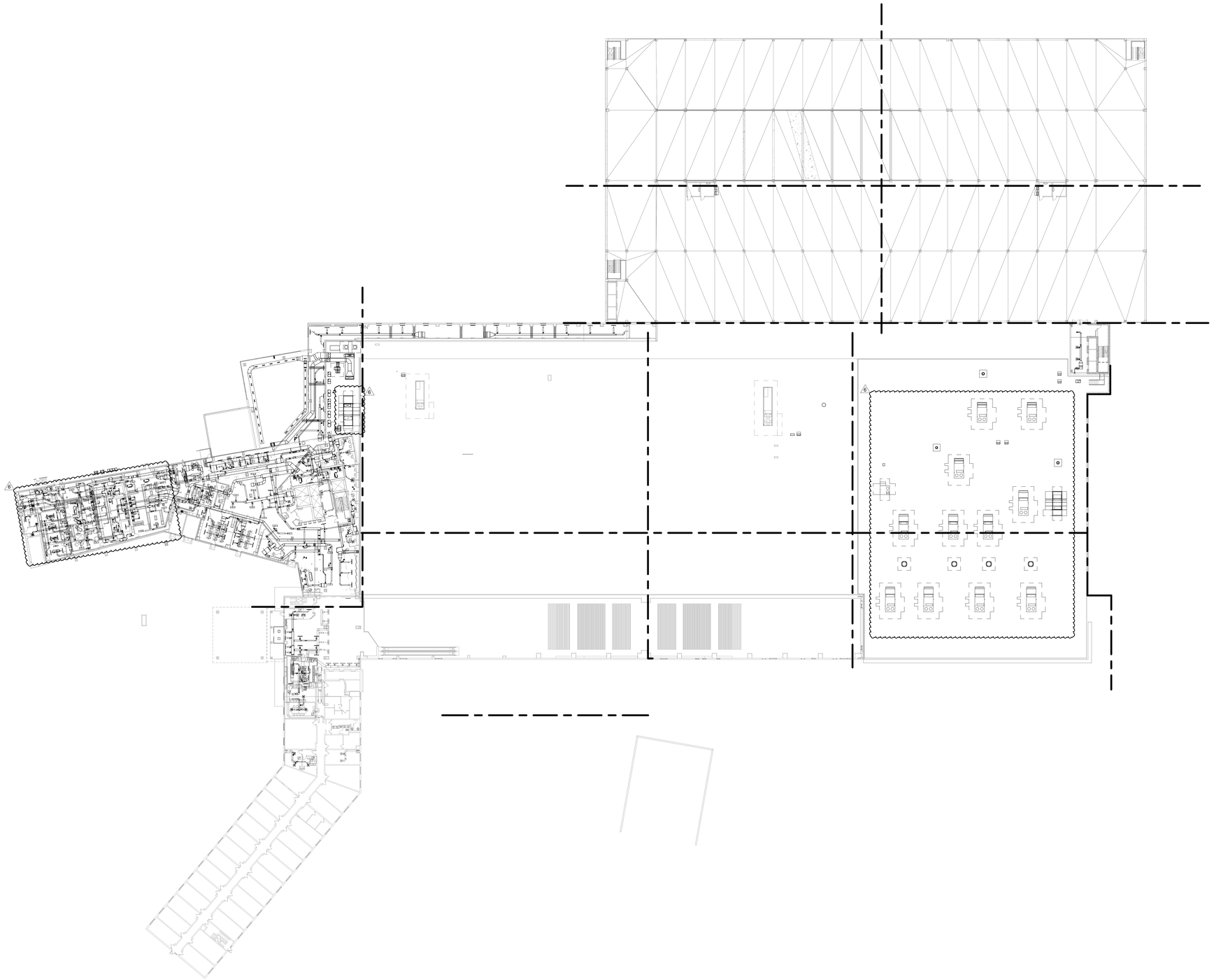
REVISIONS

6	2023-0315	BULLETIN 02
22	2023-0927	BULLETIN 18

HVAC DUCTWORK - SECOND FLOOR LEVEL - AREA G

MH-112G

9/26/2023 8:55:10 AM
DRAWING PRINTED FULL SIZE (ISO) = 24"x36" | DRAWING PRINTED HALF SIZE (ISO) = 12"x18" | IF ON A SHEET SMALLER THAN 24"x36" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DIMENSIONS GIVEN | DRAWING PRINTED FACE-T-FACE SIZE (SF FILL) = 11.25"x15.75" | IF NOT FILLED TO SCALE, CHECK ALL FLOOR SIZES. DRAWING PRINTED HARD SIZE (SF FILL) = 11.25"x15.75" | IF NOT FILLED TO SCALE, CHECK ALL FLOOR SIZES. EXAMPLE 1.5"=1'-0" (0.0781) WILL BE 3/4"=1'-0" FOR SCALES AT 24" X 36" AND 1/2"=1'-0" (0.0521) WILL BE 1/2"=1'-0" FOR SCALES AT 24" X 36" AND 3/8"=1'-0" (0.0391) WILL BE 3/8"=1'-0" FOR SCALES AT 24" X 36" AND 1/4"=1'-0" (0.0260) WILL BE 1/4"=1'-0" FOR SCALES AT 24" X 36" AND 3/16"=1'-0" (0.0195) WILL BE 3/16"=1'-0" FOR SCALES AT 24" X 36" AND 1/8"=1'-0" (0.0130) WILL BE 1/8"=1'-0" FOR SCALES AT 24" X 36" AND 3/32"=1'-0" (0.0098) WILL BE 3/32"=1'-0" FOR SCALES AT 24" X 36" AND 1/16"=1'-0" (0.0065) WILL BE 1/16"=1'-0" FOR SCALES AT 24" X 36" AND 3/64"=1'-0" (0.0049) WILL BE 3/64"=1'-0" FOR SCALES AT 24" X 36" AND 1/32"=1'-0" (0.0033) WILL BE 1/32"=1'-0" FOR SCALES AT 24" X 36" AND 1/64"=1'-0" (0.0016) WILL BE 1/64"=1'-0" FOR SCALES AT 24" X 36" AND 1/128"=1'-0" (0.0008) WILL BE 1/128"=1'-0" FOR SCALES AT 24" X 36" AND 1/256"=1'-0" (0.0004) WILL BE 1/256"=1'-0" FOR SCALES AT 24" X 36" AND 1/512"=1'-0" (0.0002) WILL BE 1/512"=1'-0" FOR SCALES AT 24" X 36" AND 1/1024"=1'-0" (0.0001) WILL BE 1/1024"=1'-0" FOR SCALES AT 24" X 36" AND 1/2048"=1'-0" (0.0000) WILL BE 1/2048"=1'-0" FOR SCALES AT 24" X 36" AND 1/4096"=1'-0" (0.0000) WILL BE 1/4096"=1'-0" FOR SCALES AT 24" X 36" AND 1/8192"=1'-0" (0.0000) WILL BE 1/8192"=1'-0" FOR SCALES AT 24" X 36" AND 1/16384"=1'-0" (0.0000) WILL BE 1/16384"=1'-0" FOR SCALES AT 24" X 36" AND 1/32768"=1'-0" (0.0000) WILL BE 1/32768"=1'-0" FOR SCALES AT 24" X 36" AND 1/65536"=1'-0" (0.0000) WILL BE 1/65536"=1'-0" FOR SCALES AT 24" X 36" AND 1/131072"=1'-0" (0.0000) WILL BE 1/131072"=1'-0" FOR SCALES AT 24" X 36" AND 1/262144"=1'-0" (0.0000) WILL BE 1/262144"=1'-0" FOR SCALES AT 24" X 36" AND 1/524288"=1'-0" (0.0000) WILL BE 1/524288"=1'-0" FOR SCALES AT 24" X 36" AND 1/1048576"=1'-0" (0.0000) WILL BE 1/1048576"=1'-0" FOR SCALES AT 24" X 36" AND 1/2097152"=1'-0" (0.0000) WILL BE 1/2097152"=1'-0" FOR SCALES AT 24" X 36" AND 1/4194304"=1'-0" (0.0000) WILL BE 1/4194304"=1'-0" FOR SCALES AT 24" X 36" AND 1/8388608"=1'-0" (0.0000) WILL BE 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1 HVAC DUCTWORK - THIRD FLOOR LEVEL OVERALL
1/32" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

777 Casino Parkway
Murphy, NC 28906

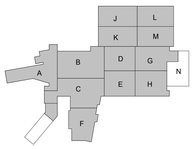
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KEY PLAN

BULLETIN 02
03/15/2023

ISSUE 01/31/2023
JOB 30611.00
DRAWN MWM
SCALE 1/32" = 1'-0"

REVISIONS

6 2023-0315 BULLETIN 02

HVAC DUCTWORK - THIRD FLOOR LEVEL OVERALL

MH-113

DRAWING PRINTED FULL SIZE (ISO A1) - IN NAP: DRAWING PRINTED HALF SIZE (ISO A3) WILL FIT ON A SHEET 'A' PLOT WITH 2.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED MARK 'THREE SIZE (27.5"x) = 11.5"x15.5" WILL FIT TIGHTLY ON 11"x17". INDIVIDUAL 12", 24", 18", 10" AND 132" VIEW BOXES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 4 AND MAKING THE NUMERATOR 3 FOR EXAMPLE, 1-3/4" = 1'-0" (21.5%) WILL BE SAME AS 7/8" = 1'-0" FOR SCALES AT 24", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1-3/4" = 1'-0" (21.5%) WILL BE SAME AS 7/8" = 1'-0"

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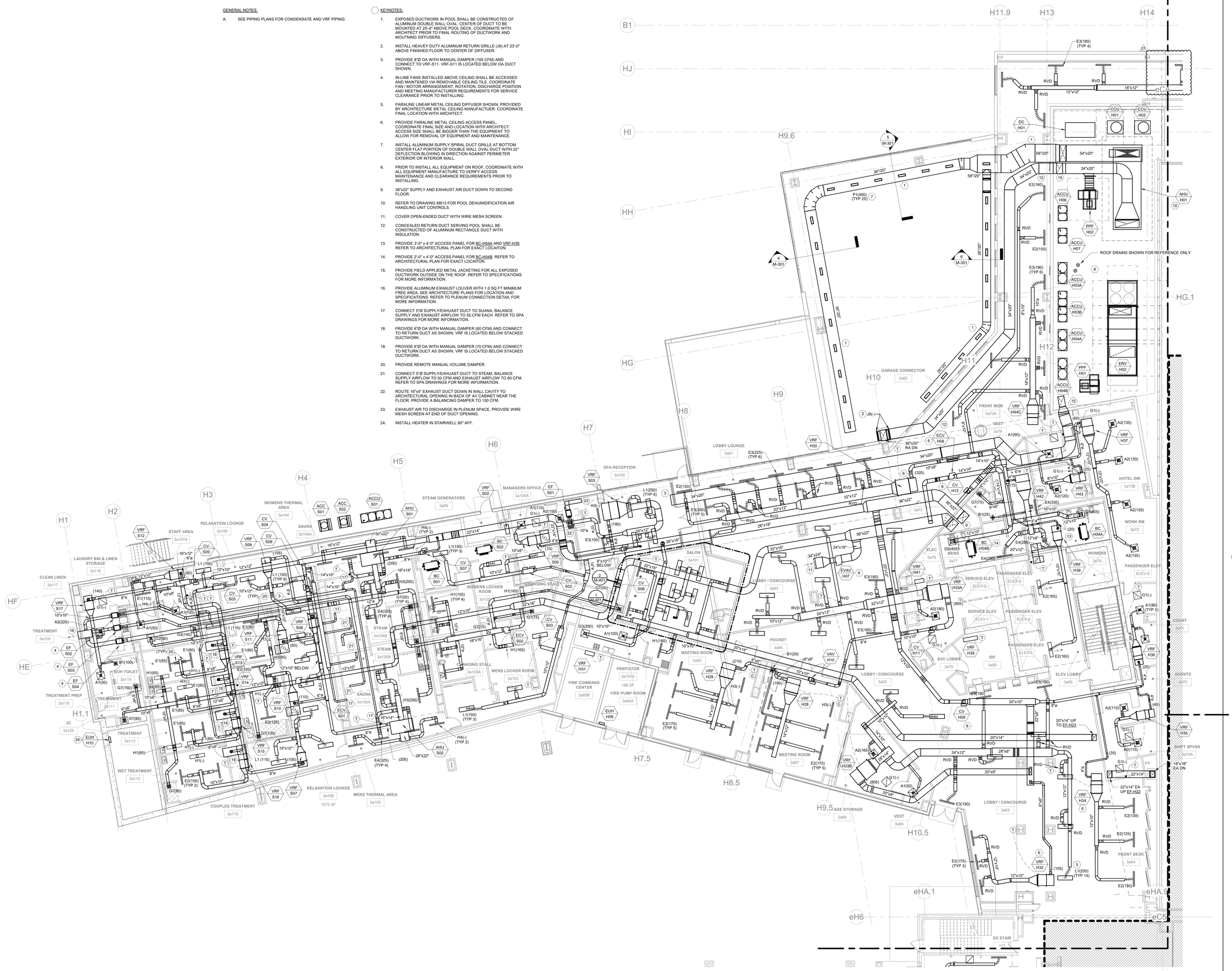
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GENERAL NOTES:

A. SEE PIPING PLANS FOR CONDENSATE AND VRF PIPING.

KEYNOTES:

1. EXPOSED DUCTWORK IN POOL SHALL BE CONSTRUCTED OF ALUMINUM DOUBLE WALL OVAL CENTER OF DUCT TO BE MOUNTED AT 25'-4" ABOVE POOL DECK. COORDINATE WITH ARCHITECT PRIOR TO FINAL ROUTING OF DUCTWORK AND MOUTNING DIFFUSERS.
2. INSTALL HEAVEY DUTY ALUMINUM RETURN GRILLE (J6) AT 23'-0" ABOVE FINISHED FLOOR TO CENTER OF DIFFUSER.
3. PROVIDE 8"Ø OA WITH MANUAL DAMPER (105 CFM) AND CONNECT TO VRF-S11. VRF-S11 IS LOCATED BELOW OA DUCT SHOWN.
4. IN-LINE FANS INSTALLED ABOVE CEILING SHALL BE ACCESSED AND MAINTENED VIA REMOVABLE CEILING TILE. COORDINATE FAN / MOTOR ARRANGEMENT, ROTATION, DISCHARGE POSITION AND MEETING MANUFACTURER REQUIREMENTS FOR SERVICE CLEARANCE PRIOR TO INSTALLING.
5. PARALINE LINEAR METAL CEILING DIFFUSER SHOWN, PROVIDED BY ARCHITECTURE METAL CEILING MANUFACTUER. COORDINATE FINAL LOCATION WITH ARCHITECT.
6. PROVIDE PARALINE METAL CEILING ACCESS PANEL, COORDINATE FINAL SIZE AND LOCATION WITH ARCHITECT. ACCESS SIZE SHALL BE BIGGER THAN THE EQUIPMENT TO ALLOW FOR REMOVAL OF EQUIPMENT AND MAINTENANCE.
7. INSTALL ALUMINUM SUPPLY SPIRAL DUCT GRILLE AT BOTTOM CENTER FLAT PORTION OF DOUBLE WALL OVAL DUCT WITH 22° DEFLECTION BLOWING IN DIRECTION AGAINST PERIMETER EXTERIOR OR INTERIOR WALL.
8. PRIOR TO INSTALL ALL EQUIPMENT ON ROOF, COORDINATE WITH ALL EQUIPMENT MANUFACTURE TO VERIFY ACCESS MAINTENANCE AND CLEARANCE REQUIREMENTS PRIOR TO INSTALLING.
9. 36"x22" SUPPLY AND EXHAUST AIR DUCT DOWN TO SECOND FLOOR.
10. REFER TO DRAWING M813 FOR POOL DEHUMIDIFICATION AIR HANDLING UNIT CONTROLS.
11. COVER OPEN-ENDED DUCT WITH WIRE MESH SCREEN.
12. CONCEALED RETURN DUCT SERVING POOL SHALL BE CONSTRUCTED OF ALUMINUM RECTANGLE DUCT WITH INSULATION.
13. PROVIDE 3'-0" x 4'-0" ACCESS PANEL FOR BC-H04A AND VRF-H38. REFER TO ARCHITECTURAL PLAN FOR EXACT LOCAITON.
14. PROVIDE 2'-0" x 4'-0" ACCESS PANEL FOR BC-H04B. REFER TO ARCHITECTURAL PLAN FOR EXACT LOCAITON.
15. PROVIDE FIELD APPLIED METAL JACKETING FOR ALL EXPOSED DUCTWORK OUTSIDE ON THE ROOF. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
16. PROVIDE ALUMINUM EXHAUST LOUVER WITH 1.0 SQ FT MINIMUM FREE AREA. SEE ARCHITECTURE PLANS FOR LOCATION AND SPECIFICATIONS. REFER TO PLENUM CONNECTION DETAIL FOR MORE INFORMATION.
17. CONNECT 5"Ø SUPPLY/EXHUAST DUCT TO SUANA, BALANCE SUPPLY AND EXHAUST AIRFLOW TO 55 CFM EACH. REFER TO SPA DRAWINGS FOR MORE INFORMATION.
18. PROVIDE 6"Ø OA WITH MANUAL DAMPER (60 CFM) AND CONNECT TO RETURN DUCT AS SHOWN. VRF IS LOCATED BELOW STACKED DUCTWORK.
19. PROVIDE 6"Ø OA WITH MANUAL DAMPER (70 CFM) AND CONNECT TO RETURN DUCT AS SHOWN. VRF IS LOCATED BELOW STACKED DUCTWORK.
20. PROVIDE REMOTE MANUAL VOLUME DAMPER.
21. CONNECT 5"Ø SUPPLY/EXHUAST DUCT TO STEAM, BALANCE SUPPLY AIRFLOW TO 50 CFM AND EXHAUST AIRFLOW TO 60 CFM. REFER TO SPA DRAWINGS FOR MORE INFORMATION.
22. ROUTE 16"x4" EXHAUST DUCT DOWN IN WALL CAVITY TO ARCHITECTURAL OPENING IN BACK OF AV CABINET NEAR THE FLOOR. PROVIDE A BALANCING DAMPER TO 150 CFM.
23. EXHAUST AIR TO DISCHARGE IN PLENUM SPACE. PROVIDE WIRE MESH SCREEN AT END OF DUCT OPENING.
24. INSTALL HEATER IN STAIRWELL 80" AFF.



1 HVAC DUCTWORK - THIRD FLOOR LEVEL - AREA A
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

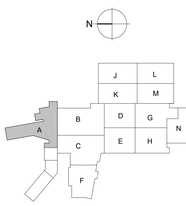
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KEY PLAN

BULLETIN 17
09/20/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	As Indicated

REVISIONS

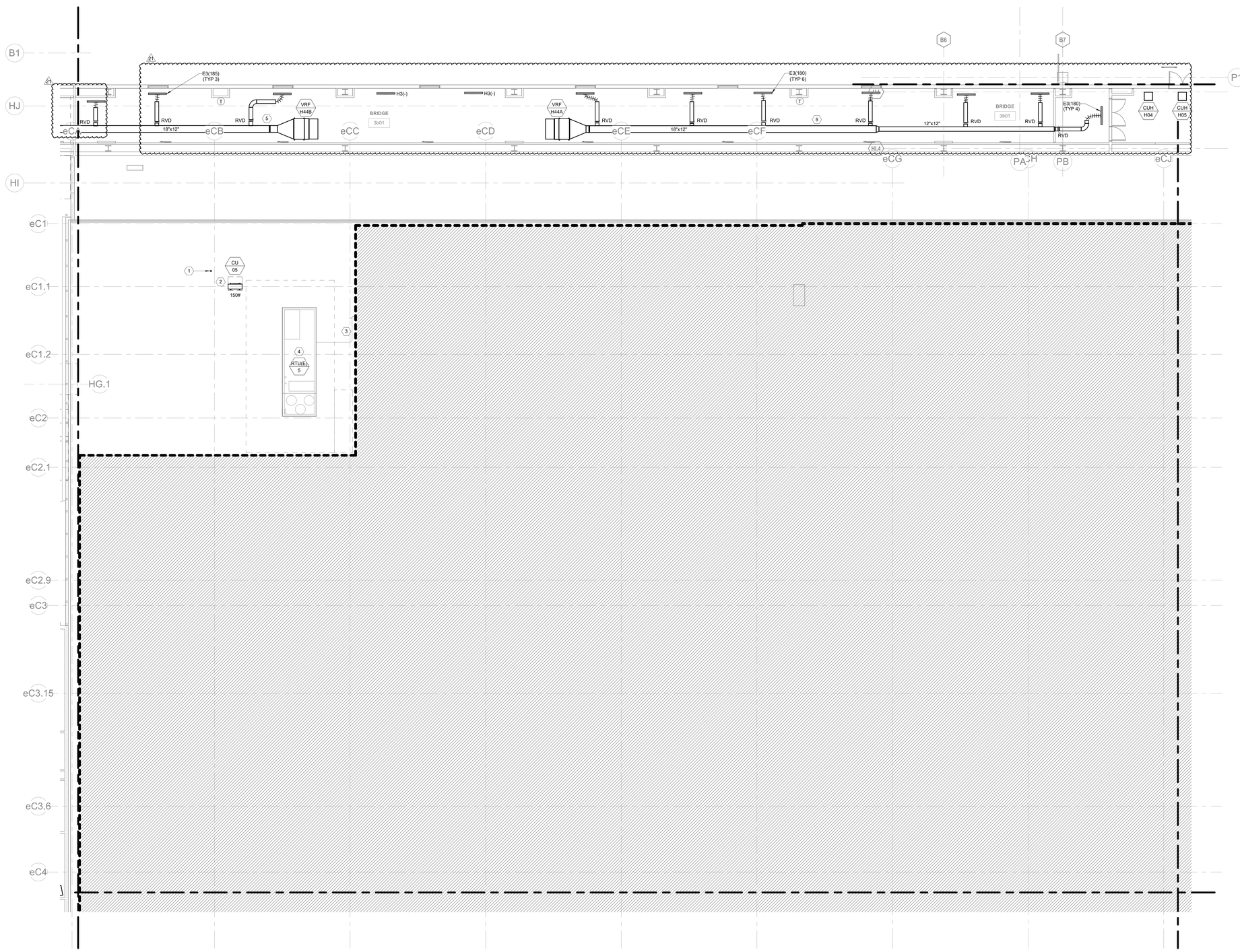
5	2023-0214	BULLETIN 01
6	2023-0315	BULLETIN 02
10	2023-0427	BULLETIN 06
11	2023-0512	BULLETIN 08
21	09/20/2023	BULLETIN 17

HVAC DUCTWORK - THIRD FLOOR LEVEL - AREA A

MH-113A

9/18/2023 4:00:52 PM
DRAWING PRINTED FULL SIZE (100%) - 36"x48" DRAWING PRINTED HALF SIZE (50%) WILL FIT ON A SHEET 18"x24" WITH A 1" (0") EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF THIS SIZE (27.5%) = 11"(0%) X 15"(0%) WILL FIT EQUALLY ON A 11"x17" INDIVIDUAL 24", 36", 1/8" AND 1/32" VIEW SCALES WILL TRANSLATE IF WHEN PRINTING THE DENOMINATOR BY AND MAKING THE NUMERATOR 1 FOR EXAMPLE 1/8"=1'-0" (1/12") WILL BE 3/64"=1'-0" FOR SCALE

770



1 HVAC DUCTWORK - THIRD FLOOR LEVEL - AREA B
1/8" = 1'-0"

GENERAL NOTES:

A. THIS AREA INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. INFORMATION CONTAINED ON THIS DRAWING WAS OBTAINED FROM THE BEST AVAILABLE INFORMATION AND IS NOT INTENDED TO LIMIT THE SCOPE OF THE WORK.

B. CONTRACTOR SHALL VISIT THE SITE PRIOR TO DETERMINE CONDITIONS AFFECTING THE EXECUTION OF THE WORK. AFTER VISITING THE SITE, REQUEST SUCH FURTHER INFORMATION AND/OR CLARIFICATION AS NECESSARY TO UNDERSTAND THE WORK REQUIRED AND TO PROPERLY ESTIMATE THE COST.

KEYNOTES:

1. 4" OA DUCT UP THRU ROOF, SEE ARCHITECTURE PLANS FOR EXISTING ROOF PENETRATION REQUIREMENTS. PROVIDE GOOSENECK INTAKE PER DETAIL ON SHEET M-503.
2. ROUTE REFRIGERANT LINES FROM OUTDOOR UNIT TO INDOOR UNIT. SIZE REFRIGERANT LINES PER MANUFACTURER REQUIREMENTS.
3. EXISTING ROOF CONDENSATE PIPING TO REMAIN.
4. INCREASE MAXIMUM AIRFLOW TO NEW CONNECTED AIRFLOW OF 6710 CFM (UNIT ORIGINAL DESIGN AIRFLOW OF 6850 CFM). MAINTAIN EXISTING OUTSIDE AIRFLOW OF 1600 CFM.
5. SLOPE DUCT TO MATCH RAMP OF BRIDGE.

Additions and Renovations to Harrah's Cherokee Valley River

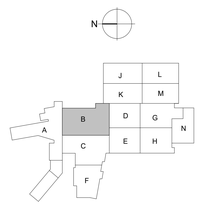
777 Casino Parkway
Murphy, NC 28906

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KEY PLAN

BULLETIN 17
09/20/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	As indicated

REVISIONS

21	09/20/2023	BULLETIN 17

HVAC DUCTWORK - THIRD FLOOR LEVEL - AREA B

MH-113B

9/18/2023 4:00:53 PM
DRAWING PRINTED FULL SIZE (30"H) - IF "SHEET" DRAWING PRINTED HALF SIZE (15"H), FILL FIT DIA 0.4937" IN OFF WITH 1/4" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF THEN SIZE (15"H) = 11.25"x15" WILL FIT TIGHTLY ON 11"x17" ADDITIONAL 1/2" OR 1/8" AND 3/32" NEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 8 AND MAKING THE NUMERATOR 1 FOR EXAMPLE 1 1/8"=1'-0" AT 1/2 (15"H) WILL BE SAME AS 1/16"=1'-0" FOR SCALES AT 3/4", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DIGITALLY AND CHANGE THE NUMERATOR BY EYE

770

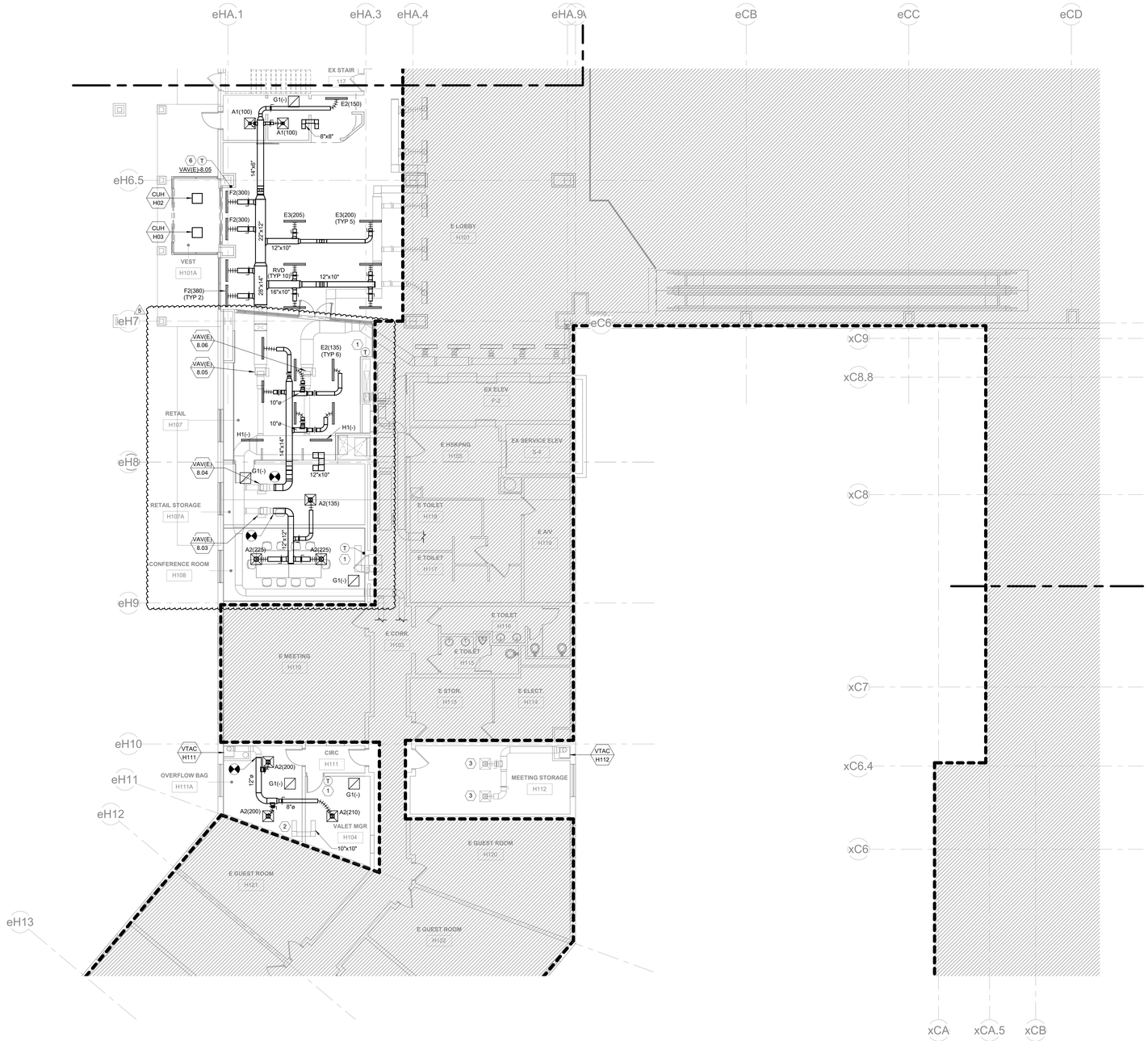
GENERAL NOTES:

A. THIS AREA INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. INFORMATION CONTAINED ON THIS DRAWING WAS OBTAINED FROM THE BEST AVAILABLE INFORMATION AND IS NOT INTENDED TO LIMIT THE SCOPE OF THE WORK.

B. CONTRACTOR SHALL VISIT THE SITE PRIOR TO DETERMINE CONDITIONS AFFECTING THE EXECUTION OF THE WORK. AFTER VISITING THE SITE, REQUEST SUCH FURTHER INFORMATION AND/OR CLARIFICATION AS NECESSARY TO UNDERSTAND THE WORK REQUIRED AND TO PROPERLY ESTIMATE THE COST.

KEYNOTES:

1. RELOCATE EXISTING THERMOSTAT TO THE LOCATION SHOWN. REWORK EXISTING CONTROL WIRING AS REQUIRED.
2. RELOCATE EXISTING TRANSFER DUCT TO LOCATION SHOWN.
3. CLEAN EXISTING DIFFUSER AND REINSTALL IN CEILING ALIGNED WITH NEW GRID. ADJUST EXISTING DUCTWORK AS REQUIRED TO INSTALL IN NEW CEILING.
4. NOTE NOT USED.
5. NOTE NOT USED.
6. EXISTING THERMOSTAT TO REMAIN.



1 HVAC DUCTWORK - THIRD FLOOR LEVEL - AREA C
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

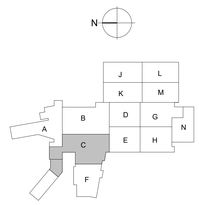
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KEY PLAN

BULLETIN 01
02/14/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	As indicated

REVISIONS

5	2023-0214	BULLETIN 01

HVAC DUCTWORK - THIRD FLOOR LEVEL - AREA C

MH-113C

2/13/2023 5:42:02 PM
DRAWING PRINTED FULL SIZE (ISO) = 34"x44" // DRAWING PRINTED HALF SIZE (ISO) = 17"x22" // IF IT ISN'T 17"x22" WHEN YOU PRINT IT IT'S EITHER SCALED OR ALL YOUR SIZES. DRAWING PRINTED EQUALLY THROUGH SIZES (IF FALL = 11.25"x15.5" WILL FIT EQUATE ON 11"x17" INDIVIDUAL 12", 24", 36", 1/8" AND 1/32" WERE SCALED WELL TRIANGULATE BY 8'S (1.75"x 5W) THE CROSSHAIRS ON BY AND MARKS THE NUMERATOR 13:1, 1:500 SAMPLE 1.38"x1.9"x1.9" (2.5"h) WILL BE 3/4"=1'-0"

7 DocuSign Envelope ID: 31C67779-8015-4E11-8D69-F10DFA204BA4

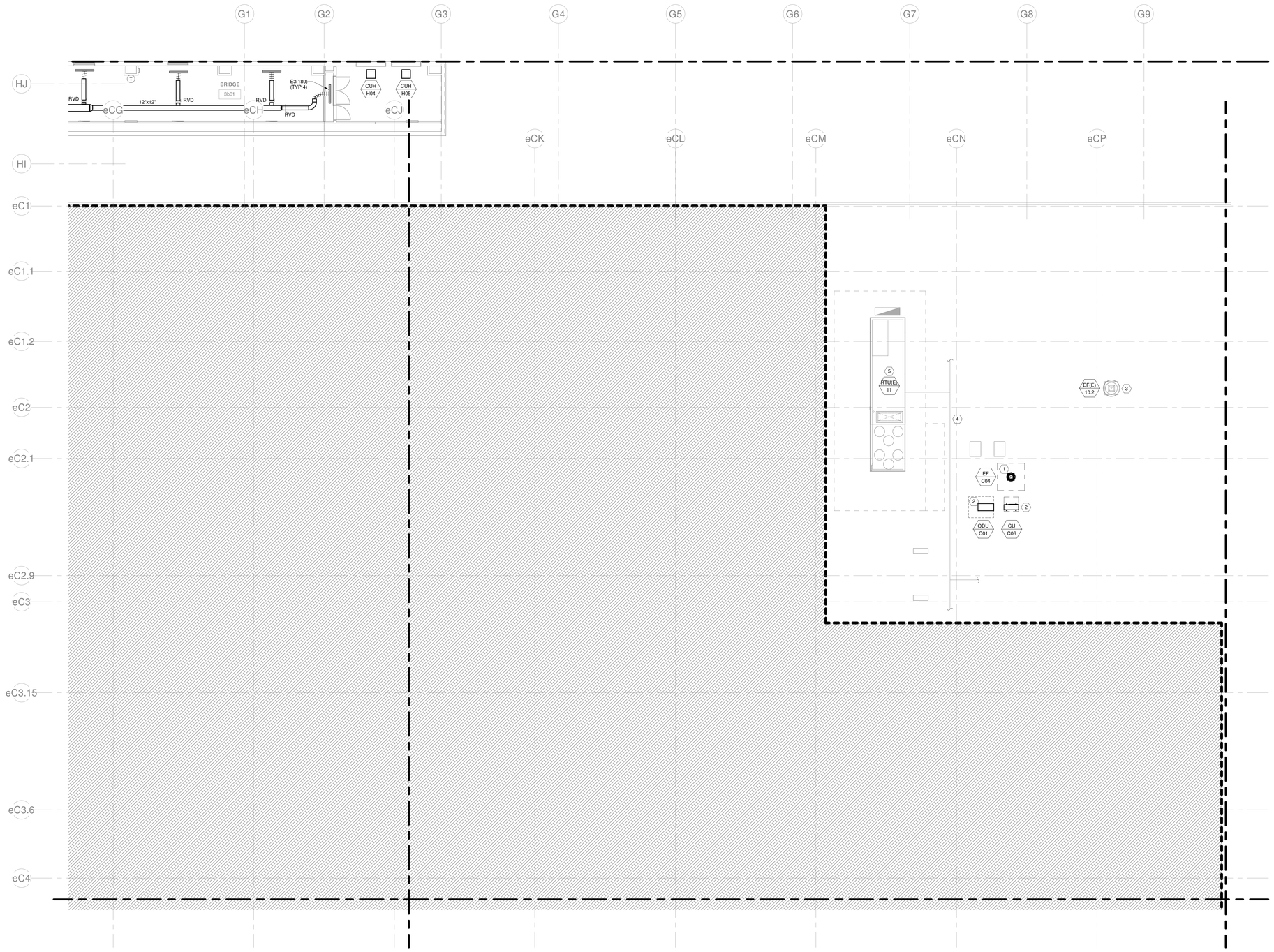
GENERAL NOTES:

A. THIS AREA INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. INFORMATION CONTAINED ON THIS DRAWING WAS OBTAINED FROM THE BEST AVAILABLE INFORMATION AND IS NOT INTENDED TO LIMIT THE SCOPE OF THE WORK.

B. CONTRACTOR SHALL VISIT THE SITE PRIOR TO DETERMINE CONDITIONS AFFECTING THE EXECUTION OF THE WORK. AFTER VISITING THE SITE, REQUEST SUCH FURTHER INFORMATION AND/OR CLARIFICATION AS NECESSARY TO UNDERSTAND THE WORK REQUIRED AND TO PROPERLY ESTIMATE THE COST.

KEYNOTES:

1. INSTALL EXHAUST FAN WITH CURB ON EXISTING ROOF, SEE ARCHITECTURE PLANS FOR EXISTING ROOF PENETRATION REQUIREMENTS.
2. ROUTE REFRIGERANT LINES FROM OUTDOOR UNIT TO INDOOR UNIT. SIZE REFRIGERANT LINES PER MANUFACTURER REQUIREMENTS.
3. REBALANCE EXISTING EXHAUST FAN TO INCREASE AIRFLOW TO 1850 CFM.
4. EXISTING ROOF CONDENSATE PIPING TO REMAIN.
5. REBALANCE EXISTING UNIT OUTSIDE AIRFLOW TO 1590 CFM (UNIT OUTSIDE AIRFLOW ORIGINALLY BALANCED TO 1275 CFM).



1 HVAC DUCTWORK - THIRD FLOOR LEVEL - AREA D
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

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Murphy, NC 28906

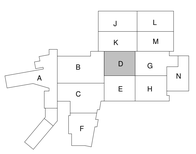
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KEY PLAN

PERMIT SET
01/31/2023



ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	As indicated
REVISIONS	

HVAC DUCTWORK - THIRD FLOOR LEVEL - AREA D

MH-113D

1/30/2023 11:25:27 AM
DRAWING PRINTED FULL SIZE | IF NOT 24"x36" DRAWING PRINTED ON A2 SIZE (420 x 594) | IF ON A SHEET 11" X 17" OR EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED NEARLY TWICE SIZE | IF BELL IS 1/2"x1/2" | IF BELL IS 1"x1" | IF BELL IS TRUE TYPE DIMENSIONS ARE CHANGE THE NUMBERS BY 2 AND MAKING THE NUMBERS 1/2 SIZE | IF BELL = 24"x12" FOR SCALE AT 24", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH | TO USE THE DIMENSIONS EQUIVALENT AND CHANGE THE NUMBERS TO 1.5 MORE'S 24"=12"-0" AT 3/16 | BELL IS 6MM"=1'-0" AT 1/8" | BELL IS 6MM"=1'-0" FOR SCALE AT 1/4", 3/8", 1/16" AND 1/32" FOR SCALE | BELL TRANSLATE IT MULTIPLY BY 2 | IF BELL = 1.5"x1.5" | IF BELL = 1.5"x1.5" | IF BELL = 1.5"x1.5"

770

GENERAL NOTES:

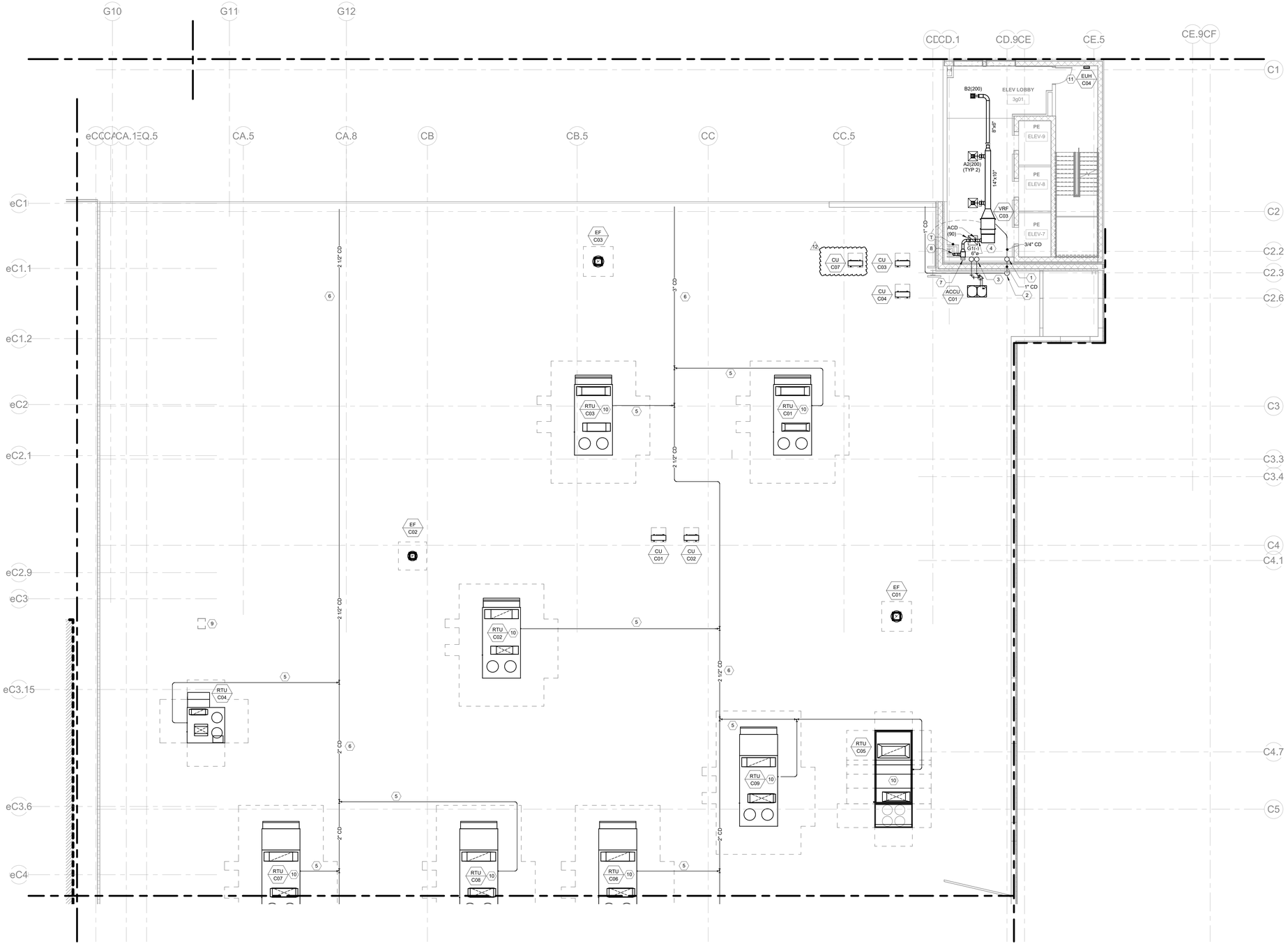
A. PIPING INCLUDED ON THIS SHEET DUE TO THE LIMITED PIPING SCOPE IN THIS AREA.

B. VRF PIPING MAINS SHOWN FOR GENERAL INTENT AND ROUTING. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR COMPLETE PIPING DISTRIBUTION AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.

C. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE.

KEYNOTES:

1. 1" CD DN FROM ABOVE. CONNECT DRAIN FROM FCU ON THIS FLOOR TO VERTICAL PIPE AS SHOWN.
2. ROUTE 1" CD DN TO ROOF AND ALONG ROOF TO GUTTER.
3. VERTICAL VRF PIPING MAINS SHOWN FOR REFERENCE AND IS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR PIPING DISTRIBUTION BETWEEN ACCU AND VRF'S FOR FINAL ROUTING AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.
4. COVER OPEN-ENDED DUCT WITH WIRE MESH SCREEN.
5. CONNECT CONDENSATE FROM RTU TO CONDENSATE MAIN RUNNING ALONG ROOF. SIZE TO MATCH UNIT CONNECTION.
6. CONDENSATE MAIN ROUTED ALONG ROOF TO GUTTER, MATCH SLOPE OF ROOF.
7. CONNECT OA INTAKE TO 12"x12" LOUVER. SEE ARCHITECTURE PLANS FOR LOCATION AND SPECIFICATIONS.
8. 6" OA DUCT UP FROM FLOOR BELOW. CONNECT TO INTAKE PLENUM.
9. CONDENSING UNIT BY FOOD SERVICE CONSULTANT FOR BEVERAGE COOLER ON 1ST LEVEL. INSTALL ON CURB PER DETAILS ON FOOD SERVICE DRAWINGS. SEE FOOD SERVICE DRAWINGS FOR MORE INFORMATION.
10. RTU WITH BOTTOM DUCT CONNECTIONS, TRANSITION DUCT INSIDE CURB TO SIZE INDICATED ON FIRST LEVEL PLAN AND ROUTE THRU ROOF TO LEVEL BELOW.
11. INSTALL HEATER IN STAIRWELL 80" AFF.



1 HVAC DUCTWORK - THIRD FLOOR LEVEL - AREA G
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

777 Casino Parkway
Murphy, NC 28906

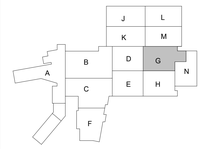
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KEY PLAN

BULLETIN 10
06/02/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	As indicated

REVISIONS

6	2023-0315	BULLETIN 02
10	2023-0427	BULLETIN 06
12	06/02/2023	BULLETIN 10

HVAC DUCTWORK - THIRD FLOOR LEVEL - AREA G

MH-113G

DRAWING PRINTED FULL SIZE (30X42IN.) - [PLAN]* - DRAWING PRINTED HALF SIZE (15X21IN.) IF LESS THAN 1/2" OF EXTRA SPACE ON ALL FOUR SIDES.

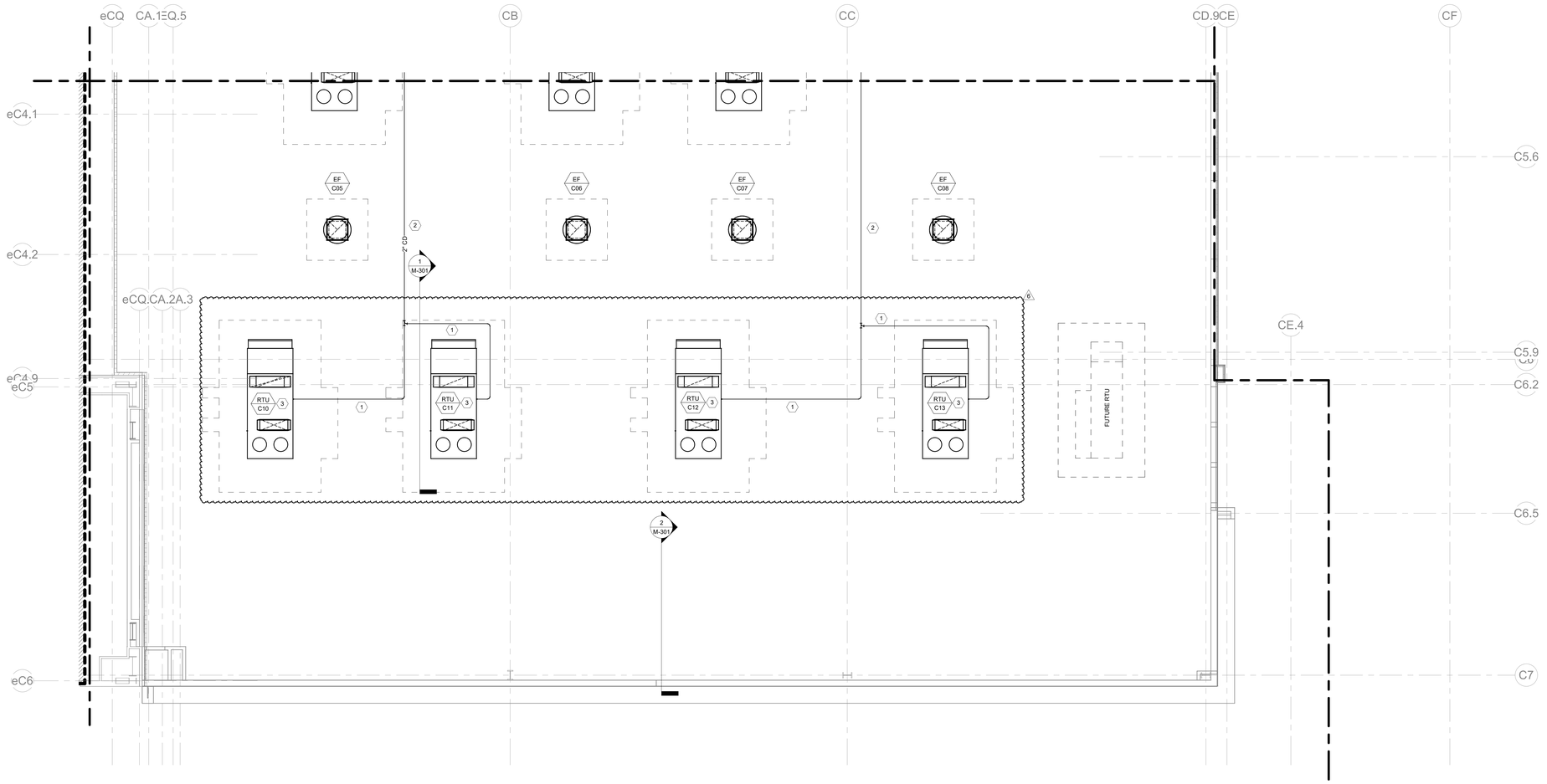
GENERAL NOTES:

A. PIPING INCLUDED ON THIS SHEET DUE TO THE LIMITED PIPING SCOPE IN THIS AREA.

B. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE.

KEYNOTES:

1. CONNECT CONDENSATE FROM RTU TO CONDENSATE MAIN RUNNING ALONG ROOF. SIZE TO MATCH UNIT CONNECTION.
2. CONDENSATE MAIN ROUTED ALONG ROOF TO GUTTER, MATCH SLOPE OF ROOF.
3. RTU WITH BOTTOM DUCT CONNECTIONS. TRANSITION DUCT INSIDE CURB TO SIZE INDICATED ON FIRST LEVEL PLAN AND ROUTE THRU ROOF TO LEVEL BELOW.



1 HVAC DUCTWORK - THIRD FLOOR LEVEL - AREA H
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

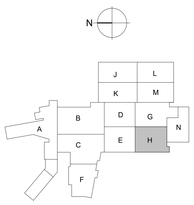
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KEY PLAN

BULLETIN 02
03/15/2023

ISSUE 01/31/2023
JOB 30611.00
DRAWN MWM
SCALE As indicated

REVISIONS

6 2023-0315 BULLETIN 02

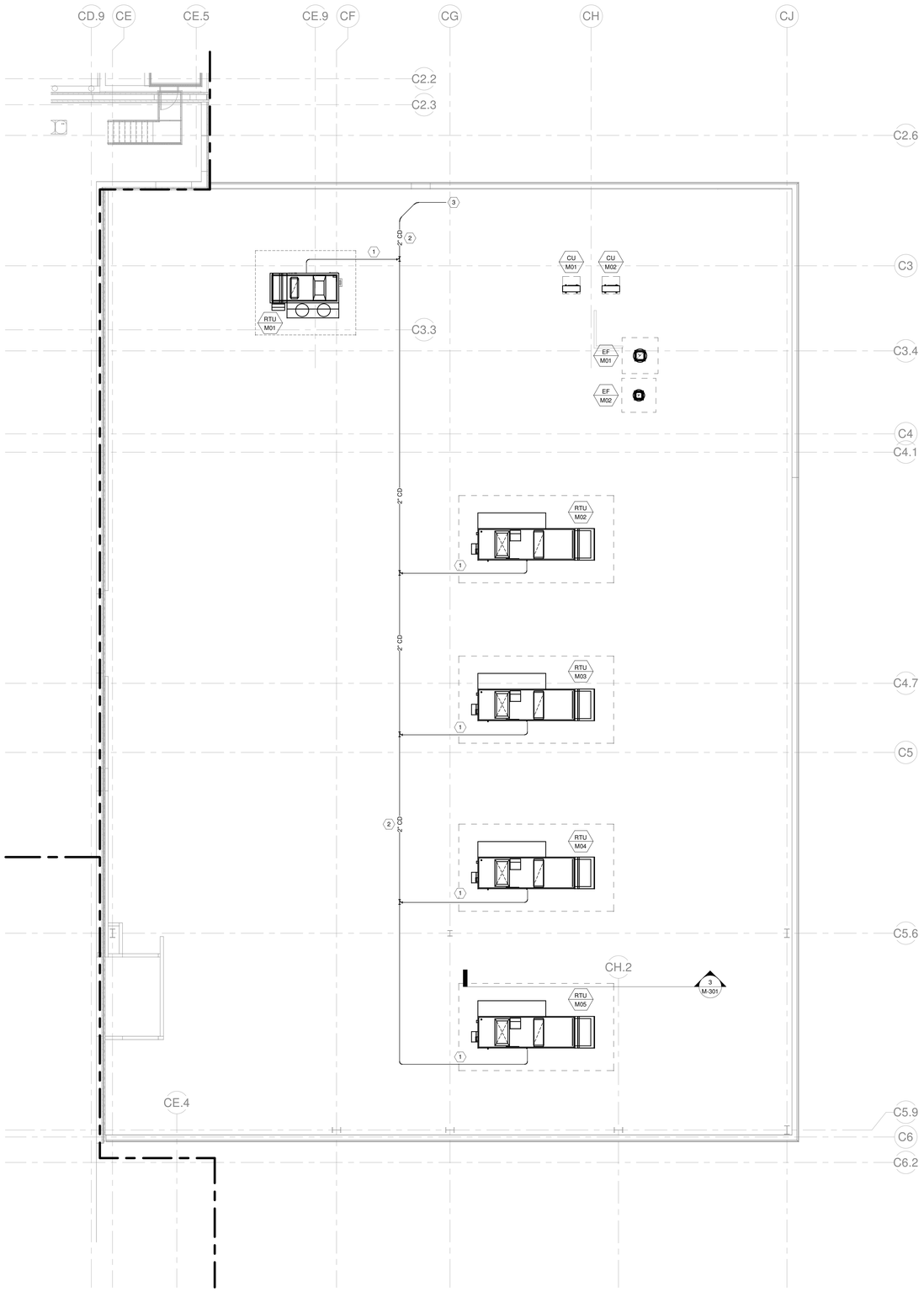
HVAC DUCTWORK - THIRD FLOOR LEVEL - AREA H

MH-113H

DRAWING PRINTED FULL SIZE (30IN) x 36"x60" DRAWING PRINTED HALF SIZE (15IN) x 18"x30" IF THIS SHEET IS NOT 24"x36" WITH 1" OF EXTRA SPACE ON ALL FOUR SIDES, DRAWING PRINTED READILY THERE SIZE OF SCL = 1'-0"x1'-0" WILL FIT EQATL ON 11"x17" ADDITIONAL 12", 24", 36", 48", 60" AND 120" NEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 2 AND SHARING THE NUMERATOR 3 FOR EXAMPLE 1 1/8"=1'-0" FOR SCALES AT 24" x 36" 1 1/2"=1'-0" FOR SCALES AT 24" x 36" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR ESSENTIALLY AND CHANGE THE NUMERATOR TO 3. 1 DOMES 24"=1'-0" AT 2/3"=1" WILL BE SCALED TO 1/4"=1'-0"

3/14/2023 10:40:17 AM

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1 HVAC DUCTWORK - THIRD FLOOR LEVEL - AREA N
1/8" = 1'-0"

GENERAL NOTES:

A. PIPING INCLUDED ON THIS SHEET DUE TO THE LIMITED PIPING SCOPE IN THIS AREA.

B. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE.

KEYNOTES:

1. CONNECT CONDENSATE FROM RTU TO CONDENSATE MAIN RUNNING ALONG ROOF. SIZE TO MATCH UNIT CONNECTION.
2. CONDENSATE MAIN ROUTED ALONG ROOF TO NEAREAST ROOF DRAIN.
3. DUMP CONDENSATE NEXT TO PRIMARY ROOF DRAIN. SEE PLUMBING DRAWINGS FOR EXACT LOCATION.

Additions and Renovations to Harrah's Cherokee Valley River

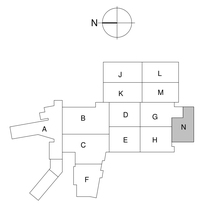
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KEY PLAN

PERMIT SET
01/31/2023

NORTH CAROLINA PROFESSIONAL 039457 ENGINEER EDWARD DALTON
1/30/2023

ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	As indicated
REVISIONS	

HVAC DUCTWORK - THIRD FLOOR LEVEL - AREA N - PHASE 2

MH-113N

1/30/2023 11:25:36 AM DRAWING PRINTED FULL SIZE (30"H) - IF PAPER DRAWING PRINTED ON A2 SIZE (24"H), IRILL FIT ON A SHEET IN HALF WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED ON A1 SIZE (30"H) IRILL FIT EXACTLY ON 11.0" (ELEVEN) OR 11.5" (ELEVEN AND ONE HALF) INCH SIDE OF IRILL = 11.0"X17.0"

GENERAL NOTES:

A. CALLOUTS SHOWN ON THIS PLAN ARE TYPICAL FOR ALL SIMILAR GUESTROOM UNIT TYPES. SEE SHEET M-400 FOR ENLRAGED VIEWS.

B. SEE PIPING PLANS FOR CONDENSATE AND VRF PIPING.

KEYNOTES:

1. INSTALL ALL MECHANICAL EQUIPMENT AND DUCTWORK IN THIS ROOM TIGHT TO DECK ABOVE.
2. MULTI-ZONE ONE-WAY CEILING CASSETTE. LOCATE UNIT WITH AIR SUPPLY DIRECTED TOWARDS EXTERIOR WALL AND CENTER WITH WINDOW.
3. RELOCATED EXISTING CONDENSING UNITS FROM FIRST FLOOR LEVEL. REFER TO DWG MD-111A. PROVIDE NEW REFRIGERANT PIPING AND RE-FILL SYSTEM PER MANUFACTURE'S RECOMMENDATIONS.
4. FUTURE SPA EXHAUST FAN EF-23 SHOWN FOR REFERENCE ONLY, NOT INSTALLED AS PART OF THIS CONSTRUCTION DOCUMENT.



1 HVAC DUCTWORK - FOURTH FLOOR LEVEL - AREA A
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

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Murphy, NC 28906

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KEY PLAN

BULLETIN 15
09/13/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	As indicated

REVISIONS

10	2023-0427	BULLETIN 06
19	09/13/2023	BULLETIN 15

HVAC DUCTWORK - FOURTH FLOOR LEVEL - AREA A

MH-114A

9/12/2023 1:23:52 PM
DRAWING PRINTED FULL SIZE (100%) = 36"x48" DRAWING PRINTED HALF SIZE (50%) WILL FIT ON A SHEET 18"x24" WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (50%) = 11"(H)x15.5"(W) WILL FIT TIGHTLY ON 11"x17" ARCHIVAL SIZE. 1/4", 1/8", 1/16", 1/32", 1/64" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR ESSENTIALLY AND CHANGE THE NUMERATOR TO 1. 1:100(M1) 3/4"=1'-0"(A1) 3/8"=1'-0"(A1) WILL BE SAME AS 1/8"=1'-0"

7 DocuSign Envelope ID: 31C67779-8015-4E11-8D69-F10DFA204BA4

GENERAL NOTES:

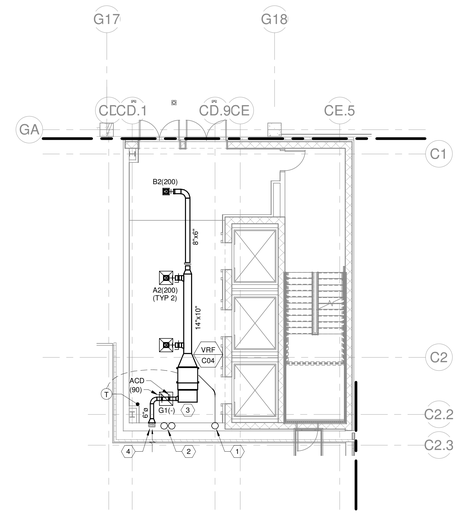
A. PIPING INCLUDED ON THIS SHEET DUE TO THE LIMITED PIPING SCOPE IN THIS AREA.

B. VRF PIPING MAINS SHOWN FOR GENERAL INTENT AND ROUTING. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR COMPLETE PIPING DISTRIBUTION AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.

C. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE.

KEYNOTES:

1. 3/4" CD DN FROM ABOVE, 1" CD DN TO BELOW. CONNECT DRAIN FROM FCU ON THIS FLOOR TO VERTICAL PIPE AS SHOWN.
2. VERTICAL VRF PIPING MAINS SHOWN FOR REFERENCE AND IS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR PIPING DISTRIBUTION BETWEEN ACCU AND VRF'S FOR FINAL ROUTING AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.
3. COVER OPEN-ENDED DUCT WITH WIRE MESH SCREEN.
4. CONNECT OA INTAKE TO 12"x12" LOUVER. SEE ARCHITECTURE PLANS FOR LOCATION AND SPECIFICATIONS.



1 HVAC DUCTWORK - LEVEL G4 - AREA G
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

777 Casino Parkway
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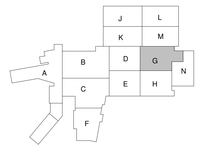
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KEY PLAN

PERMIT SET
01/31/2023

NORTH CAROLINA PROFESSIONAL 039457 ENGINEER EDWARD DALTON
1/30/2023

ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	As indicated
REVISIONS	

HVAC DUCTWORK - LEVEL G4 - AREA G

MH-114G

1/30/2023 11:25:49 AM DRAWING PRINTED FULL SIZE (18"x24") - IN SHT. DRAWING PRINTED HALF SIZE (24"x36") WILL FIT ON A SHEET 18"x24" WITH 1.0"X" EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED SCALE: 1" = 1'-0" FOR SCALES AT 24" X 36" SHEETS AND 1/2" = 1'-0" FOR SCALES AT 12" X 18" SHEETS. THE TRANSLATION IS CODE ENOUGH TO USE THE DENOMINATOR DIGITS ONLY AND CHANGE THE NUMERATOR TO 1. EXAMPLE: 3/4"=1'-0" AT 12"X18" SHEETS IS 1/16"=1'-0". 1/2"=1'-0" FOR SCALES AT 24" X 36" SHEETS IS 1/32"=1'-0". 1/2"=1'-0" FOR SCALES AT 12" X 18" SHEETS IS 1/64"=1'-0". 1/4"=1'-0" FOR SCALES AT 24" X 36" SHEETS IS 1/16"=1'-0". 1/4"=1'-0" FOR SCALES AT 12" X 18" SHEETS IS 1/32"=1'-0". 1/8"=1'-0" FOR SCALES AT 24" X 36" SHEETS IS 1/32"=1'-0". 1/8"=1'-0" FOR SCALES AT 12" X 18" SHEETS IS 1/64"=1'-0". 3/32"=1'-0" FOR SCALES AT 24" X 36" SHEETS IS 1/64"=1'-0". 3/32"=1'-0" FOR SCALES AT 12" X 18" SHEETS IS 1/128"=1'-0". 3/16"=1'-0" FOR SCALES AT 24" X 36" SHEETS AND 1/2"=1'-0" FOR SCALES AT 12" X 18" SHEETS THE TRANSLATION IS CODE ENOUGH TO USE THE DENOMINATOR DIGITS ONLY AND MARK THE NUMERATOR 3 FOR EXAMPLE, 3/16"=1'-0" AT 24" X 36" SHEETS IS 3/192"=1'-0". 3/16"=1'-0" AT 12" X 18" INDIVIDUAL 12" 24" X 18" 1/16" EXCESS WILL TRANSLATE BY MAL DITIC FACTOR DENOMINATOR BY AND MARK THE NUMERATOR 3 FOR EXAMPLE, 3/16"=1'-0" AT 24" X 36" SHEETS IS 3/192"=1'-0". 3/16"=1'-0" AT 12" X 18" SHEETS IS 3/96"=1'-0". 3/4"=1'-0" AT 24" X 36" SHEETS IS 1/16"=1'-0". 3/4"=1'-0" AT 12" X 18" SHEETS IS 1/32"=1'-0". 1"=1'-0" AT 24" X 36" SHEETS IS 1/32"=1'-0". 1"=1'-0" AT 12" X 18" SHEETS IS 1/64"=1'-0". 1 1/2"=1'-0" AT 24" X 36" SHEETS IS 1/64"=1'-0". 1 1/2"=1'-0" AT 12" X 18" SHEETS IS 1/128"=1'-0". 3"=1'-0" AT 24" X 36" SHEETS IS 1/128"=1'-0". 3"=1'-0" AT 12" X 18" SHEETS IS 1/256"=1'-0". 6"=1'-0" AT 24" X 36" SHEETS IS 1/256"=1'-0". 6"=1'-0" AT 12" X 18" SHEETS IS 1/512"=1'-0". 12"=1'-0" AT 24" X 36" SHEETS IS 1/512"=1'-0". 12"=1'-0" AT 12" X 18" SHEETS IS 1/1024"=1'-0". 1"=1'-0" AT 24" X 36" SHEETS IS 1/1024"=1'-0". 1"=1'-0" AT 12" X 18" SHEETS IS 1/2048

770

GENERAL NOTES:

A. SEE CALLOUTS ON 4TH LEVEL PLAN FOR REFERENCE TO ENLARGED GUESTROOM PLANS.

B. SEE PIPING PLANS FOR CONDENSATE AND VRF PIPING.

KEYNOTES:

1. INSTALL ALL MECHANICAL EQUIPMENT AND DUCTWORK IN THIS ROOM TIGHT TO DECK ABOVE.



1 HVAC DUCTWORK - FIFTH FLOOR LEVEL - AREA A
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

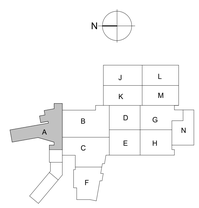
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KEY PLAN

BULLETIN 15
09/13/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	As indicated

REVISIONS

19	09/13/2023	BULLETIN 15

HVAC DUCTWORK - FIFTH FLOOR LEVEL - AREA A

MH-115A

DRAWING PRINTED FULL SIZE (30"H) = 24"x36" DRAWING PRINTED HALF SIZE (15"H) WILL FIT ON A SHEET 11"X24" WITH 1/2" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15"H) WILL FIT ON A SHEET 11"X17" WITH 1/2" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15"H) WILL FIT ON A SHEET 11"X17" WITH 1/2" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15"H) WILL FIT ON A SHEET 11"X17" INDIVIDUAL 12", 24", 36", 1/16" AND 1/32" VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 2 AND CHANGE THE NUMERATOR TO 1. 1/32ABS 1.24"=1'-0" (1/32) WILL BE 1/64ABS 0.75"=1'-0".

9/12/2023 1:23:58 PM

7 DocuSign Envelope ID: 31C67779-8015-4E11-8D69-F10DFA204BA4

GENERAL NOTES:

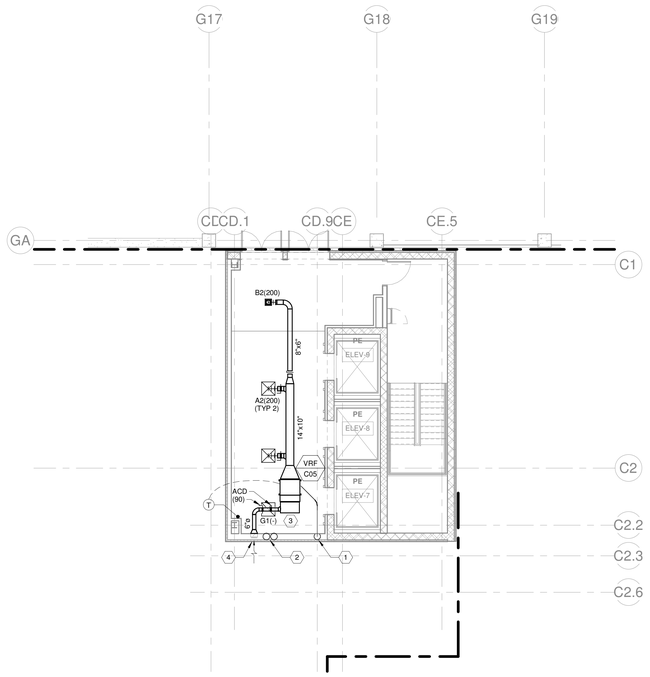
A. PIPING INCLUDED ON THIS SHEET DUE TO THE LIMITED PIPING SCOPE IN THIS AREA.

B. VRF PIPING MAINS SHOWN FOR GENERAL INTENT AND ROUTING. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR COMPLETE PIPING DISTRIBUTION AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.

C. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE.

KEYNOTES:

1. 3/4" CD DN TO BELOW.
2. VERTICAL VRF PIPING MAINS SHOWN FOR REFERENCE AND IS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR PIPING DISTRIBUTION BETWEEN ACCU AND VRF'S FOR FINAL ROUTING AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.
3. COVER OPEN-ENDED DUCT WITH WIRE MESH SCREEN.
4. CONNECT OA INTAKE TO 12"x12" LOUVER. SEE ARCHITECTURE PLANS FOR LOCATION AND SPECIFICATIONS.



1 HVAC DUCTWORK - LEVEL G5 - AREA G
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

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Murphy, NC 28906

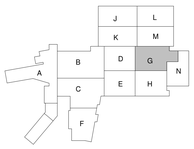
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KEY PLAN

PERMIT SET
01/31/2023



ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	As indicated

REVISIONS

HVAC DUCTWORK - LEVEL G5 - AREA G

MH-115G

1/30/2023 11:26:02 AM DRAWING PRINTED FULL SIZE (30"H) - IF PLOT DRAWING PRINTED HALF SIZE (15"H), WILL BE 24"H X 2" FOR SCALES AT 24", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DESIGNATED HERE. THIS SIZE (3" WILL = 1 1/2"H) IT WILL FIT EQUITLY ON 11"X17" (ELEVEN), 12", 14", 16", 18", 20", 22", 24", 26", 28", 30", AND 32" FOR SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 8 AND SHARING THE NUMERATOR TO 1. EXAMPLE 3/4"=1'-0" AT (15") WILL BE 6X8 SET TO 1/4"=1'-0".

770

GENERAL NOTES:

A. SEE CALLOUTS ON 4TH LEVEL PLAN FOR REFERENCE TO ENLARGED GUESTROOM PLANS.

B. SEE PIPING PLANS FOR CONDENSATE AND VRF PIPING.

KEYNOTES:

1. INSTALL ALL MECHANICAL EQUIPMENT AND DUCTWORK IN THIS ROOM TIGHT TO DECK ABOVE.



1 HVAC DUCTWORK - SIXTH FLOOR LEVEL
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

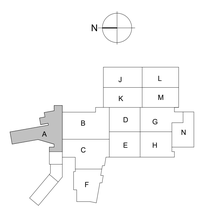
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KEY PLAN

BULLETIN 15
09/13/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	As indicated

REVISIONS

10	2023-0427	BULLETIN 06
19	09/13/2023	BULLETIN 15

HVAC DUCTWORK - SIXTH FLOOR LEVEL

MH-116

9/12/2023 1:24:03 PM DRAWING PRINTED FULL SIZE (100%) IF "24x36" DRAWING PRINTED HALF SIZE (50%) IMAGE FIT ON SHEET EQUIP WITH 1 FT OF EXTRA SPACE ON ALL FOUR SIDES

770

GENERAL NOTES:

A. SEE CALLOUTS ON 4TH LEVEL PLAN FOR REFERENCE TO ENLARGED GUESTROOM PLANS.

B. SEE PIPING PLANS FOR CONDENSATE AND VRF PIPING.

KEYNOTES:

1. INSTALL ALL MECHANICAL EQUIPMENT AND DUCTWORK IN THIS ROOM TIGHT TO DECK ABOVE.



1 HVAC DUCTWORK - SEVENTH FLOOR LEVEL
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

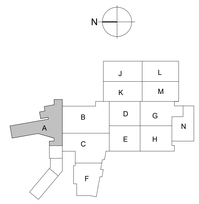
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KEY PLAN

BULLETIN 15
09/13/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	As indicated

REVISIONS

19 09/13/2023 BULLETIN 15

HVAC DUCTWORK - SEVENTH FLOOR LEVEL

MH-117

DRAWING PRINTED FULL SIZE (30"x42") - IN SHT. DRAWING PRINTED HALF SIZE (15"x21") WILL FIT ON A SHEET 18"x24" WITH 2.0" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED MARK "THIRD SIZE (12"x16") = 11.5"x15.75" WILL FIT TIGHTLY ON A 11"x17". INDIVIDUAL 22", 24", 18", 12" AND 10" VIEW SCALES WILL TYPICALLY BE WALLS ONLY AND CHANGE THE NUMERATOR BY ANY AMOUNTS THE NUMERATOR IS 1. 1/32ARE 1 3/4"=1'-0" (21.875% WILL BE SAME SIZE AT 24", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR ESSENTIALLY AND CHANGE THE NUMERATOR TO 1. 1/32ARE 1 3/4"=1'-0" (21.875% WILL BE SAME SIZE AT 24", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR ESSENTIALLY AND CHANGE THE NUMERATOR TO 1. 1/32ARE 1 3/4"=1'-0" (21.875% WILL BE SAME SIZE AT 24", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR ESSENTIALLY AND CHANGE THE NUMERATOR TO 1.

9/12/2023 1:24:09 PM

770

GENERAL NOTES:

A. SEE CALLOUTS ON 4TH LEVEL PLAN FOR REFERENCE TO ENLARGED GUESTROOM PLANS.

B. SEE PIPING PLANS FOR CONDENSATE AND VRF PIPING.

KEYNOTES:

1. INSTALL ALL MECHANICAL EQUIPMENT AND DUCTWORK IN THIS ROOM TIGHT TO DECK ABOVE.
2. INSTALL HEATER IN STAIRWELL 80" AFF.



1 HVAC DUCTWORK - EIGHTH FLOOR LEVEL
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

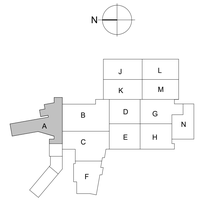
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KEY PLAN

BULLETIN 15
09/13/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	As indicated

REVISIONS

10	2023-0427	BULLETIN 06
19	09/13/2023	BULLETIN 15

HVAC DUCTWORK - EIGHTH FLOOR LEVEL

MH-118

DRAWING PRINTED FULL SIZE (30"x42") - IN WHP: DRAWING PRINTED HALF SIZE (15"x21") WILL FIT ON A SHEET 18"x24" WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED SCALE (1" = 1'-0") X 0.75" WILL FIT TIGHTLY ON A 11"x17". INDIVIDUAL 12", 24", 1/8", 1/16" AND 1/32" VIEW SCALES WILL TYPICALLY BE WALL FITTING THE DIMENSION BY ANGLE MAKING THE NUMERATOR 0.5 X 1.5 EXAMPLE: 1/8"=1'-0" (0.5") WILL BE SCALED TO 1/4"=1'-0"

8/13/2023 1:24:14 PM

770

GENERAL NOTES:

A. SEE CALLOUTS ON 4TH LEVEL PLAN FOR REFERENCE TO ENLARGED GUESTROOM PLANS.

B. SEE PIPING PLANS FOR CONDENSATE AND VRF PIPING.

KEYNOTES:

1. INSTALL ALL MECHANICAL EQUIPMENT AND DUCTWORK IN THIS ROOM TIGHT TO DECK ABOVE.

2. PROVIDE GEAR TYPE VOLUME DAMPER WITH MEMORY STOPS, YOUNG REGULATOR OR EQUAL. THIS IS TYPICAL FOR ALL STAIR PRESSURIZATION VOLUME DAMPERS.



1 HVAC DUCTWORK - NINTH FLOOR LEVEL
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

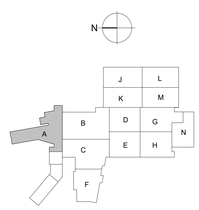
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KEY PLAN

BULLETIN 15
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ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	As indicated

REVISIONS

10	2023-0427	BULLETIN 06
19	09/13/2023	BULLETIN 15

HVAC DUCTWORK - NINTH FLOOR LEVEL

MH-119

9/12/2023 1:24:20 PM DRAWING PRINTED FULL SIZE (100%) 24"x36" DRAWING PRINTED HALF SIZE (50%) WILL FIT ON A 648ET 36"x24" WITH 1/1 OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED HALF SIZE (50%) WILL FIT ON A 432ET 24"x18" WITH 1/1 OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED HALF SIZE (50%) WILL FIT TIGHTLY ON 11"x17" ARCHIVAL 12" x 18" HAS 1/2" WIDE BORDERS WILL TRANSLATE BY MULTIPLYING THE DIMENSION BY 0.9 AND MAKING THE NUMBERS 1.5 FOR EXAMPLE 1.5"=1.4" 2.5"=2.3" ETC WILL BE SAFE IF 2.5" FOR SCALES AT 24" x 36" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR ESSENTIALLY AND CHANGE THE NUMERATOR TO 1. 1 DOUBLE 1.5"=1.4" 2.5"=2.3"

770

GENERAL NOTES:

A. SEE CALLOUTS ON 4TH LEVEL PLAN FOR REFERENCE TO ENLARGED GUESTROOM PLANS.

B. SEE PIPING PLANS FOR CONDENSATE AND VRF PIPING.

KEYNOTES:

1. INSTALL ALL MECHANICAL EQUIPMENT AND DUCTWORK IN THIS ROOM TIGHT TO DECK ABOVE.

2. PROVIDE GEAR TYPE VOLUME DAMPER WITH MEMORY STOPS, YOUNG REGULATOR OR EQUAL. THIS IS TYPICAL FOR ALL STAIR PRESSURIZATION VOLUME DAMPERS.



1 HVAC DUCTWORK - TENTH FLOOR LEVEL
1/8" = 1'-0"

DRAWING PRINTED FULL SIZE (30IN.) - DRAWING PRINTED HALF SIZE (15IN.) IF ON A SHEET 30"x20" WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED READILY THERE SIZE OF ALL 11.25"x15.75" WILL FIT EQUITLY ON 11.5" ADDITIONAL 1.5", 1/4", 1/8", 1/16" AND 1/32" NEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 2 AND SHARING THE NUMERATOR 1:3/8 = 1/4"=1'-0" 1:3/16 = 1/8"=1'-0" 1:3/32 = 1/16"=1'-0" 1:3/64 = 1/32"=1'-0" 1:3/128 = 1/64"=1'-0" 1:3/256 = 1/128"=1'-0" 1:3/512 = 1/256"=1'-0" FOR SCALES BETWEEN 1/4" = 1'-0" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 1/2" = 1'-0" AND 1/4" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 1" = 1'-0" AND 1/2" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 3" = 1'-0" AND 1" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 1 1/2" = 1'-0" AND 3" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 3 1/2" = 1'-0" AND 1 1/2" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 6" = 1'-0" AND 3 1/2" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 12" = 1'-0" AND 6" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 24" = 1'-0" AND 12" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 48" = 1'-0" AND 24" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 96" = 1'-0" AND 48" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 192" = 1'-0" AND 96" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 384" = 1'-0" AND 192" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 768" = 1'-0" AND 384" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 1536" = 1'-0" AND 768" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 3072" = 1'-0" AND 1536" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 6144" = 1'-0" AND 3072" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 12288" = 1'-0" AND 6144" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 24576" = 1'-0" AND 12288" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 49152" = 1'-0" AND 24576" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 98304" = 1'-0" AND 49152" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 196608" = 1'-0" AND 98304" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 393216" = 1'-0" AND 196608" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 786432" = 1'-0" AND 393216" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 1572864" = 1'-0" AND 786432" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 3145728" = 1'-0" AND 1572864" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 6291456" = 1'-0" AND 3145728" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 12582912" = 1'-0" AND 6291456" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 25165824" = 1'-0" AND 12582912" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 50331648" = 1'-0" AND 25165824" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 100663296" = 1'-0" AND 50331648" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 201326592" = 1'-0" AND 100663296" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 402653184" = 1'-0" AND 201326592" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 805306368" = 1'-0" AND 402653184" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 1610612736" = 1'-0" AND 805306368" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 3221225472" = 1'-0" AND 1610612736" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 6442450944" = 1'-0" AND 3221225472" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 12884901888" = 1'-0" AND 6442450944" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 25769803776" = 1'-0" AND 12884901888" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 51539607552" = 1'-0" AND 25769803776" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 103079215104" = 1'-0" AND 51539607552" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 206158430208" = 1'-0" AND 103079215104" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 412316860416" = 1'-0" AND 206158430208" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 824633720832" = 1'-0" AND 412316860416" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 1649267441664" = 1'-0" AND 824633720832" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 3298534883328" = 1'-0" AND 1649267441664" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 6597069766656" = 1'-0" AND 3298534883328" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 13194139533312" = 1'-0" AND 6597069766656" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 26388279066624" = 1'-0" AND 13194139533312" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 52776558133248" = 1'-0" AND 26388279066624" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 105553116266496" = 1'-0" AND 52776558133248" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 211106232532992" = 1'-0" AND 105553116266496" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 422212465065984" = 1'-0" AND 211106232532992" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 844424930131968" = 1'-0" AND 422212465065984" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 1688849860263936" = 1'-0" AND 844424930131968" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 3377699720527872" = 1'-0" AND 1688849860263936" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 6755399441055744" = 1'-0" AND 3377699720527872" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 13510798882111488" = 1'-0" AND 6755399441055744" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 27021597764222976" = 1'-0" AND 13510798882111488" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 54043195528445952" = 1'-0" AND 27021597764222976" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 108086391056891904" = 1'-0" AND 54043195528445952" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 216172782113783808" = 1'-0" AND 108086391056891904" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 432345564227567616" = 1'-0" AND 216172782113783808" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 864691128455135232" = 1'-0" AND 432345564227567616" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 1729382256910270464" = 1'-0" AND 864691128455135232" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 3458764513820540928" = 1'-0" AND 1729382256910270464" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 6917529027641081856" = 1'-0" AND 3458764513820540928" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 13835058055282163712" = 1'-0" AND 6917529027641081856" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 27670116110564327424" = 1'-0" AND 13835058055282163712" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 55340232221128654848" = 1'-0" AND 27670116110564327424" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 110680464442257309696" = 1'-0" AND 55340232221128654848" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 221360928884514619392" = 1'-0" AND 110680464442257309696" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 442721857769029238784" = 1'-0" AND 221360928884514619392" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 885443715538058477568" = 1'-0" AND 442721857769029238784" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 1770887431076116955136" = 1'-0" AND 885443715538058477568" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 3541774862152233910272" = 1'-0" AND 1770887431076116955136" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 7083549724304467820544" = 1'-0" AND 3541774862152233910272" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 14167099448608935641088" = 1'-0" AND 7083549724304467820544" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 28334198897217871282176" = 1'-0" AND 14167099448608935641088" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 56668397794435742564352" = 1'-0" AND 28334198897217871282176" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 113336795588871485128704" = 1'-0" AND 56668397794435742564352" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 226673591177742970257408" = 1'-0" AND 113336795588871485128704" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 453347182355485940514816" = 1'-0" AND 226673591177742970257408" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 906694364710971881029632" = 1'-0" AND 453347182355485940514816" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 1813388729421943762059264" = 1'-0" AND 906694364710971881029632" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 3626777458843887524118528" = 1'-0" AND 1813388729421943762059264" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 7253554917687775048237056" = 1'-0" AND 3626777458843887524118528" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 14507109835375550096474112" = 1'-0" AND 7253554917687775048237056" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 29014219670751100192948224" = 1'-0" AND 14507109835375550096474112" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 58028439341502200385896448" = 1'-0" AND 29014219670751100192948224" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 116056878683004400771792896" = 1'-0" AND 58028439341502200385896448" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 232113757366008801543585792" = 1'-0" AND 116056878683004400771792896" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 464227514732017603087171584" = 1'-0" AND 232113757366008801543585792" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 928455029464035206174343168" = 1'-0" AND 464227514732017603087171584" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 1856910058928070412348686336" = 1'-0" AND 928455029464035206174343168" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 3713820117856140824697372672" = 1'-0" AND 1856910058928070412348686336" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 7427640235712281649394745344" = 1'-0" AND 3713820117856140824697372672" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 14855280471424563298789490688" = 1'-0" AND 7427640235712281649394745344" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 29710560942849126597578981376" = 1'-0" AND 14855280471424563298789490688" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 59421121885698253195157962752" = 1'-0" AND 29710560942849126597578981376" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 118842243771396506390315925504" = 1'-0" AND 59421121885698253195157962752" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 237684487542793012780631851008" = 1'-0" AND 118842243771396506390315925504" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 475368975085586025561263702016" = 1'-0" AND 237684487542793012780631851008" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 950737950171172051122527404032" = 1'-0" AND 475368975085586025561263702016" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 1901475900342344102245054808064" = 1'-0" AND 950737950171172051122527404032" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 3802951800684688204490109616128" = 1'-0" AND 1901475900342344102245054808064" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SCALES BETWEEN 7605903601369376408980219232256" = 1'-0" AND 3802951800684688204490109616128" = 1'-0" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:3/4"=1'-0" 1:3/8"=1'-0" FOR SC

770

GENERAL NOTES:

A. SEE CALLOUTS ON 4TH LEVEL PLAN FOR REFERENCE TO ENLARGED GUESTROOM PLANS.

B. SEE PIPING PLANS FOR CONDENSATE AND VRF PIPING.

KEYNOTES:

1. INSTALL ALL MECHANICAL EQUIPMENT AND DUCTWORK IN THIS ROOM TIGHT TO DECK ABOVE.
2. PROVIDE 2-HR FIRE WRAP FROM THE SHAFT PENETRATION TO ROOF PENETRATION.
3. PROVIDE GEAR TYPE VOLUME DAMPER WITH MEMORY STOPS, YOUNG REGULATOR OR EQUAL. THIS IS TYPICAL FOR ALL STAIR PRESSURIZATION VOLUME DAMPERS.



1 HVAC DUCTWORK - ELEVENTH FLOOR LEVEL
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

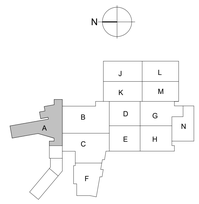
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KEY PLAN

BULLETIN 15
09/13/2023

ISSUE 01/31/2023
JOB 30611.00
DRAWN MWM
SCALE As indicated

REVISIONS

10 2023-0427 BULLETIN 06
19 09/13/2023 BULLETIN 15

HVAC DUCTWORK - ELEVENTH FLOOR LEVEL

MH-121

9/12/2023 1:24:31 PM DRAWING PRINTED FULL SIZE (100%) - IF NOT 30X42 PRINTED HALF SIZE (50%) WILL FIT ON A SHEET 11"X17" WITH 2.0" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED SCALE (1" = 1'-0") X 0.75" WILL FIT TIGHTLY ON A 11"X17". INDIVIDUAL 12", 24", 18", 1/2" AND 1/32" VIEW SCALES WILL TYPICALLY BE WELL FITTING ONE (ENDORSATION BY ANY) MARKS THE NUMERATOR 3 FOR EXAMPLE 3/8"=1'-0" (37.5%) WILL BE SCARCELY TO 1/4"=1'-0"

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GENERAL NOTES:

A. SEE PIPING PLANS FOR CONDENSATE AND VRF PIPING.

KEYNOTES:

1. ROUTE 6" FLUE VENT FROM WATER HEATER CONNECTION UP THRU ROOF ABOVE. FLUE VENT SHALL BE CONSTRUCTED OF SCHEDULE 40 SOLID PVC PIPE. INSTALL VENT PER MANUFACTURER INSTRUCTIONS. ANY HORIZONTAL RUNS SHALL SLOPE BACK TOWARDS WATER HEATER AT A MINIMUM OF 1/4 INCH PER LINEAR FOOT.
2. ROUTE 6" COMBUSTION AIR VENT FROM WATER HEATER CONNECTION TO EXTERIOR WALL AS SHOWN. PROVIDE ANGLED WALL CAP WITH WIRE MESH SCREEN AT VENT TERMINATION. MAINTAIN A MINIMUM OF 18" BETWEEN EACH TERMINATION. INSTALL VENT PER MANUFACTURER INSTRUCTIONS.
3. GAS-FIRED WATER HEATER, SEE PLUMBING DRAWINGS FOR MORE INFORMATION. TYPICAL.
4. PROVIDE GEAR TYPE VOLUME DAMPER WITH MEMORY STOPS, YOUNG REGULATOR OR EQUAL. THIS IS TYPICAL FOR ALL STAIR PRESSURIZATION VOLUME DAMPERS.
5. PROVIDE 2-HR FIRE WRAP FROM THE SHAFT PENETRATION TO ROOF PENETRATION.
6. 30"x20" EA UP TO KEF-R01 ON ROOF ABOVE. TRANSITION DUCT TO MATCH FAN CONNECTION SIZE.
7. 12"x12" EA UP TO KEF-R02 ON ROOF ABOVE. TRANSITION DUCT TO MATCH FAN CONNECTION SIZE.
8. 20"x20" EA UP TO KEF-R03 ON ROOF ABOVE. TRANSITION DUCT TO MATCH FAN CONNECTION SIZE.
9. TYPE 1 KITCHEN HOOD. SEE FOOD SERVICE DRAWINGS FOR HOOD INFORMATION. SIZE AND BALANCE ALL EXHAUST DUCT AND MAKE-UP DUCT CONNECTIONS PER FOOD SERVICE PLANS.
10. 18"x18" SA DN FROM MAU-R01 ON ROOF ABOVE.
11. 28"x20" SA DN FROM MAU-R01 ON ROOF ABOVE.
12. PROVIDE SINGLE CONTROLLER EQUAL TO MODEL PASCR165 FOR THE CONTROL OF ALL FOUR PATIO HEATERS.
13. DISHWASHER EXHAUST DUCT SHALL BE ALUMINUM CONSTRUCTION AND SLOPE TOWARDS DISHWASHER CONNECTIONS. DISHWASHER CONNECTIONS TO WAREWASHER BY KITCHEN CONSULTANT, SEE FOOD SERVICE PLANS.



1 HVAC DUCTWORK - TWELFTH FLOOR LEVEL
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

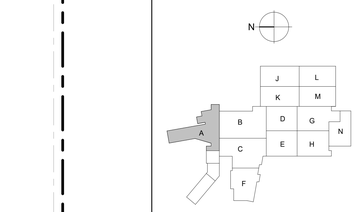
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KEY PLAN

BULLETIN 06
04/27/2023

NORTH CAROLINA PROFESSIONAL 039457 ENGINEER R. GREGORY VANDERWEIL
4/27/2023

ISSUE	01/31/2023	
JOB	30611.00	
DRAWN	MWM	
SCALE	As indicated	

REVISIONS

5	2023-0214	BULLETIN 01
6	2023-0315	BULLETIN 02
10	2023-0427	BULLETIN 06

HVAC DUCTWORK - TWELFTH FLOOR LEVEL

MH-122

DRAWING PRINTED FULL SIZE (100%) - IF NOT DRAWING PRINTED HALF SIZE (50%), WELL IT CAN HURT IT TO UP STRETCH SPACE ON ALL FOUR SIDES. DRAWING PRINTED SCALE: THREE SIZE (37.5%) - 11 STRETCH TO WELL FIT TIGHTLY ON 11"x17". ADDITIONAL SIZE: 12", 24", 18", 1/16" AND 1/32" VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY EACH MARKING THE NUMERATOR 1 FOR EXAMPLE, 1/8" = 0" AT 1/2" WILL BE 3/4"=1'-0" FOR SCALES AT 24", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1/32ARTS 3/4"=1'-0" AT 37.5% WILL BE 3/4"=1'-0" FOR SCALES AT 24", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1/32ARTS 3/4"=1'-0" AT 37.5% WILL BE 3/4"=1'-0"

4/26/2023 12:18:42 PM

7 DocuSign Envelope ID: 459EA24D-6F6B-4087-9F94-2C2E65B52B4C

GENERAL NOTES:

A. SEE PIPING PLANS FOR CONDENSATE AND VRF PIPING.

KEYNOTES:

1. 6" FLUE VENT FROM WATER HEATER ON FLOOR BELOW. FLUE VENT SHALL BE CONSTRUCTED OF SCHEDULE 40 SOLID PVC PIPE. SEE DETAIL ON SHEET M-503.
2. OMNI TEMP REFRIGERATION RACK PROVIDED BY OTHERS. COORDINATE WITH ALL TRADES PRIOR TO FINALIZING LOCATION. SEE FOOD SERVICE PLANS FOR MORE INFORMATION.
3. PROVIDE GEAR TYPE VOLUME DAMPER WITH MEMORY STOPS, YOUNG REGULATOR OR EQUAL. THIS IS TYPICAL FOR ALL STAIR PRESSURIZATION VOLUME DAMPERS.



1 HVAC DUCTWORK - HOTEL ROOF LEVEL 01
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

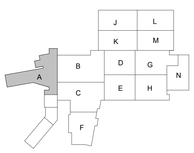
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KEY PLAN

BULLETIN 06
04/27/2023

NORTH CAROLINA PROFESSIONAL 039457 ENGINEER BENJAMIN MARK DALLON
4/27/2023

ISSUE	01/31/2023
JOB	30611.00
DRAWN	MWM
SCALE	As indicated

REVISIONS

5	2023-0214	BULLETIN 01
6	2023-0315	BULLETIN 02
10	2023-0427	BULLETIN 06

HVAC DUCTWORK - HOTEL ROOF LEVEL 01

MH-123

4/26/2023 12:16:46 PM DRAWING PRINTED FULL SIZE (30"H) + 36"x48" DRAWING PRINTED HALF SIZE (15"H) ALL FIT ON A 24X36T 9"x24" WITH 1'0" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED RADIALLY WHEN SIZE (3'0"ALL) + 1'-0"H WILL FIT TIGHTLY ON 11"x17" INDIVIDUAL 12", 24", 36", 156" AND 132"-WIDE SCALE STRIPS. TRIANGULATE BY MULTIPLYING THE DENOMINATOR BY 8 AND MARKING THE NUMERATOR TO 1, 3 OR 5 (EXAMPLE: 1-3/4"=1'-0" AT 1/2"=1'-0" AT 3/8"=1'-0" AND 3/32"=1'-0" AT 1/16"=1'-0" AT 1/32"=1'-0" AT 1/64"=1'-0" AT 1/128"=1'-0" WILL BE 3/4"=1'-0" AT 1/4"=1'-0" AT 1/8"=1'-0" AT 1/16"=1'-0" AT 1/32"=1'-0" AT 1/64"=1'-0" AT 1/128"=1'-0" WILL BE 5/8

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1 HVAC DUCTWORK - HOTEL ROOF LEVEL 02
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

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Murphy, NC 28906

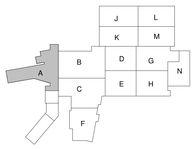
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KEY PLAN

PERMIT SET
01/31/2023



ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	1/8" = 1'-0"

REVISIONS

HVAC DUCTWORK - HOTEL ROOF LEVEL 02

MH-124

1/30/2023 11:27:07 AM DRAWING PRINTED FULL SIZE (30"H) - SHEET DRAWING PRINTED HALF SIZE (15"H) WILL BE SAME "X" FOR SCALES AT 24", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DOCUMENT AND CHANGE THE NUMERATOR TO 1. EXAMPLE 3/4"=1'-0" AT 22"H WILL BE HARDSET TO 1/4"=1'-0".

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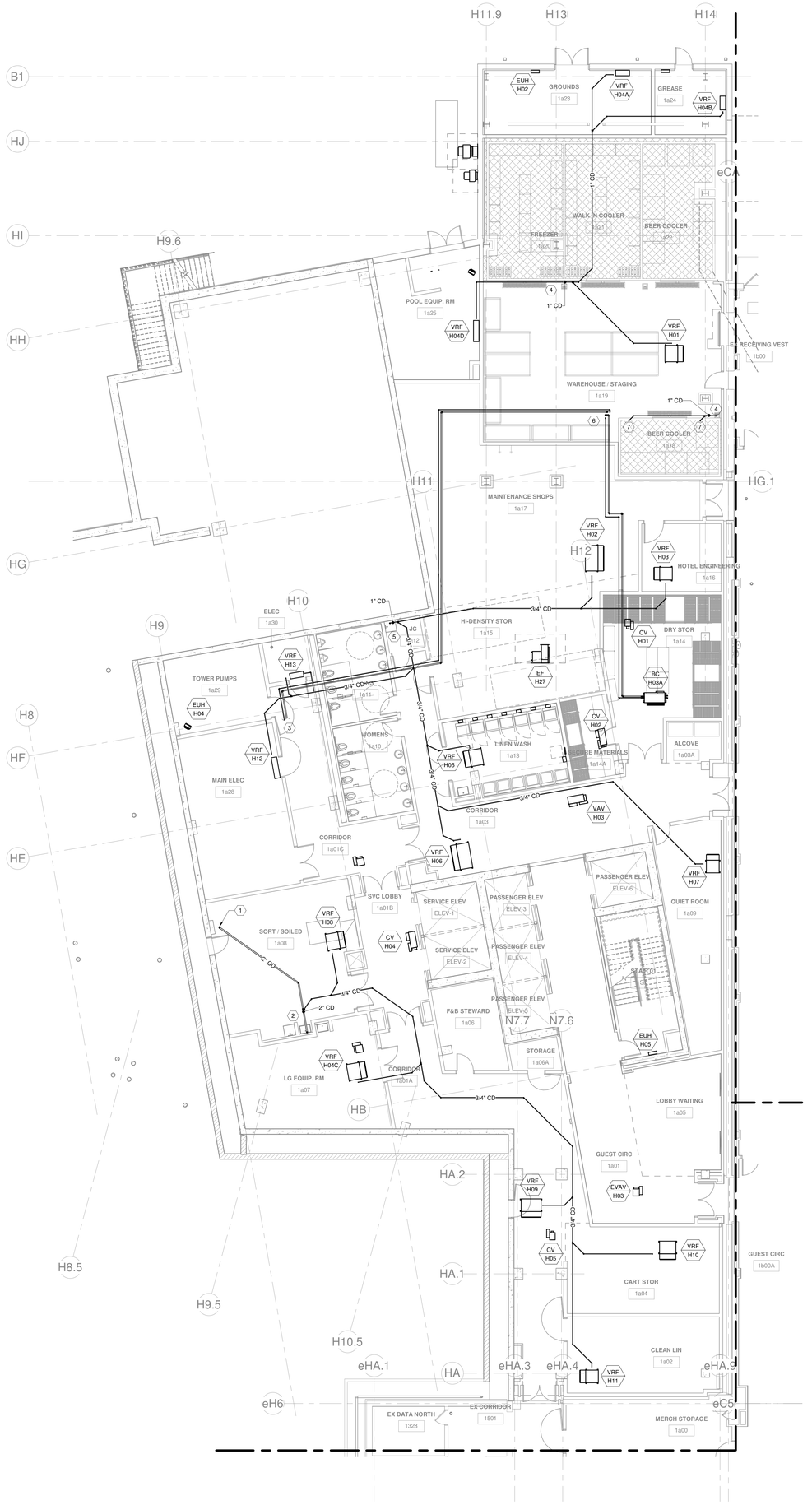
GENERAL NOTES:

A. VRF PIPING MAINS SHOWN FOR GENERAL INTENT AND ROUTING. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR COMPLETE PIPING DISTRIBUTION AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.

B. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE. CONDENSATE PIPING SHOWN FOR GENERAL INTENT AND ROUTING.

KEYNOTES:

1. 2" CD DN FROM ABOVE.
2. ROUTE 2" CD DOWN AND DUMP TO MOP SINK.
3. VRF PIPING MAINS SHOWN FOR REFERENCE AND IS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR PIPING DISTRIBUTION BETWEEN ACCU AND VRF'S FOR FINAL ROUTING AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.
4. ROUTE 1" CD DOWN AND DUMP TO FLOOR SINK.
5. ROUTE 1" CD DOWN AND DUMP TO MOP SINK.
6. VRF VERTICAL PIPING MAINS FROM ABOVE.
7. CONDENSATE FROM CRAC UNIT ABOVE SIZED TO MATCH UNIT CONNECTION.



1 HVAC PIPING - FIRST FLOOR LEVEL - AREA A
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

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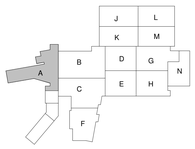
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KEY PLAN

PERMIT SET
01/31/2023

NORTH CAROLINA PROFESSIONAL 039457 ENGINEER EDWARD DALTON
1/30/2023

ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	As indicated
REVISIONS	

HVAC PIPING - FIRST FLOOR LEVEL - AREA A

MP-111A

1/30/2023 11:27:15 AM
DRAWING PLOTTED FULL SIZE (18"H) - IF NOT 24"x36"(DRAWING PLOTTED AT 24"x36") OR ARCH D SIZE (24"H) - IT CAN & SHEET IS NOT WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PLOTTED SCALE: 1"=1'-0" IF WILL FIT TIGHTLY ON 11"x17" INDIVIDUAL 22"x34" - 1.5" AND 132" VIEW SCALES WILL TYPICALLY BE WILL BE ON THE (24)36(48)OR 60 FAR MARKS THE NUMBER FOR 3 FOR EXAMPLE 1/8"=1'-0" (IF IT'S WILL BE SMALLER THAN 1/8"=1'-0" (FOR SCALE AT 24" - 3/16" AND 332" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR ESQUIVALENT AND CHANGE THE NUMERATOR TO 1. EXAMPLE 3/4"=1'-0" AT (372) WILL BE RARELY TO 1/4"=1'-0"

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GENERAL NOTES:

A. VRF PIPING MAINS SHOWN FOR GENERAL INTENT AND ROUTING. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR COMPLETE PIPING DISTRIBUTION AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.

B. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE. CONDENSATE PIPING SHOWN FOR GENERAL INTENT AND ROUTING.

KEYNOTES:

1. 2" CD DN. CONNECT CONDENSATE DRAIN FROM VRF UNIT(S) ON THIS FLOOR TO VERTICAL PIPE AS SHOWN.
2. 2" CD DN FROM ABOVE.
3. VRF PIPING MAINS SHOWN FOR REFERENCE AND IS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR PIPING DISTRIBUTION BETWEEN ACCU AND VRF'S FOR FINAL ROUTING AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.
4. ROUTE 1" CD DOWN AND DUMP TO MOP SINK.
5. VRF VERTICAL PIPING MAINS FROM ABOVE.
6. VRF VERTICAL PIPING DOWN TO FIRST FLOOR.
7. ROUTE REFRIGERANT LINES FROM INDOOR UNIT TO OUTDOOR UNIT ON ROOF ABOVE. SIZE REFRIGERANT LINES PER MANUFACTURER REQUIREMENTS.
8. CONDENSATE SIZED TO MATCH UNIT PIPE CONNECTION DOWN TO BELOW.



1 HVAC PIPING - SECOND FLOOR LEVEL - AREA A
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

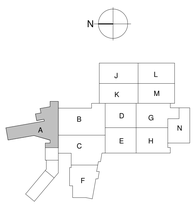
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KEY PLAN

PERMIT SET
01/31/2023

NORTH CAROLINA PROFESSIONAL 039457 ENGINEER RICHARD DALTON
1/30/2023

ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	As indicated
REVISIONS	

HVAC PIPING - SECOND FLOOR LEVEL - AREA A

MP-112A

1/30/2023 11:27:22 AM
DRAWING PRINTED FULL SIZE (1/8"=1' - 1'-0") • XR:\AIT (DRAWING PRINTED 24x36 (ON HALF FOR CAD SHEET) (M:\QP WORK 1-2 OF EXTRA SPACE ON ALL FOUR SIDES) DRAWING PRINTED NEAR 1" THREE SIZE (21.0in. = 1'-1 1/2") 0.5 STYLE FULL FIT (TIGHT) CAN 1"=1" - NOT VISUAL, 22" (34" X 36" PAGE 132" VIEW SCALES MIN.) TRANSLATE BY HALF) THIS PAGE THE DESIGNATION BY A HAS MARKED THE NUMBER FOR 3 FOR EXAMPLE 1 IN 1"=1" IF AT 20' FILL WILL BE SAW=1" FOR SCALES AT 24", 30", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DESIGNATION DOUGHNUT AND CHANGE THE NUMBER FOR 1 FOR EXAMPLE 1 IN 1"=1" IF AT 20' FILL WILL BE SAW=1" FOR SCALES AT 24", 30", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO US

780

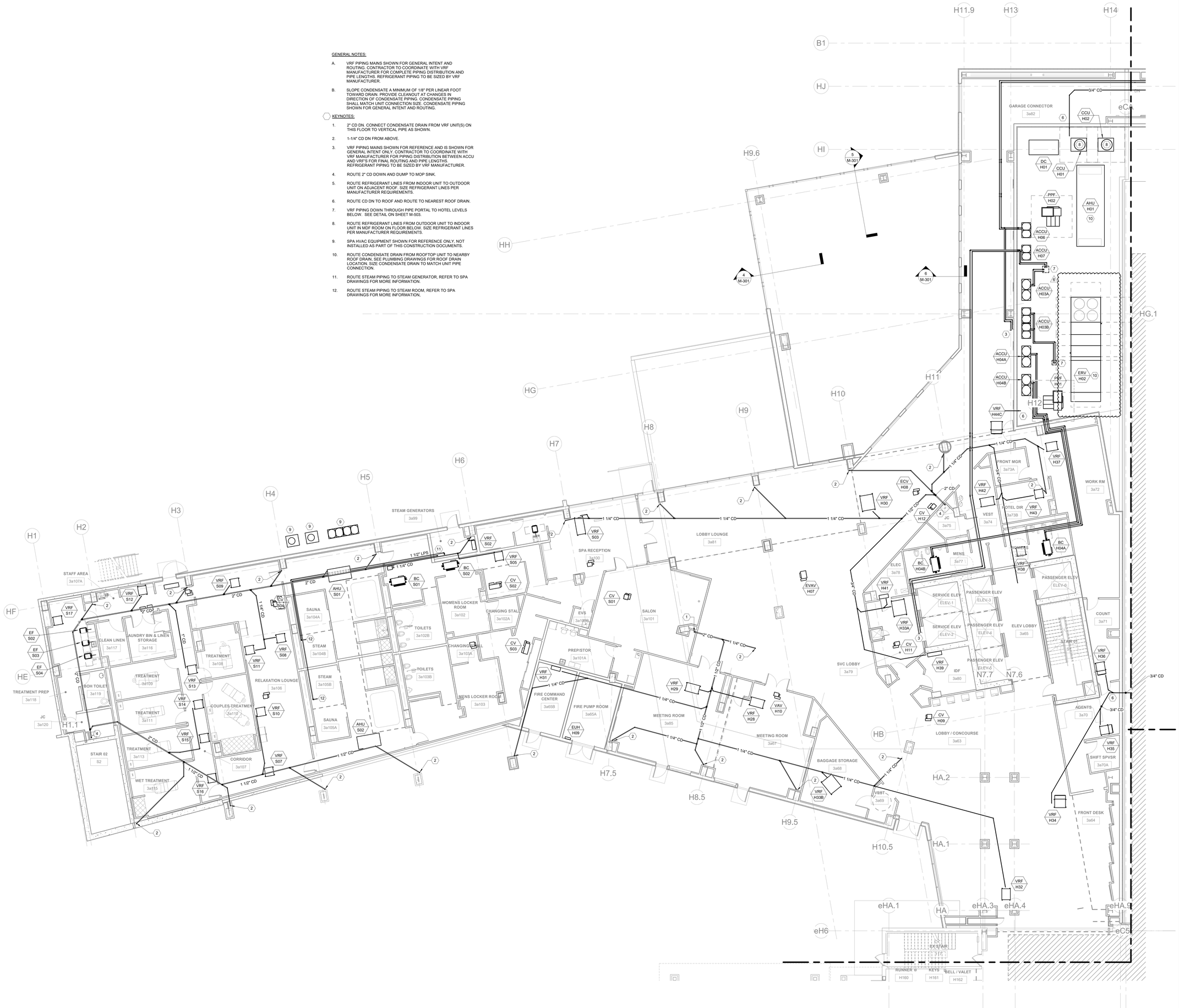
GENERAL NOTES:

A. VRF PIPING MAINS SHOWN FOR GENERAL INTENT AND ROUTING. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR COMPLETE PIPING DISTRIBUTION AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.

B. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE. CONDENSATE PIPING SHOWN FOR GENERAL INTENT AND ROUTING.

KEYNOTES:

1. 2" CD DN. CONNECT CONDENSATE DRAIN FROM VRF UNIT(S) ON THIS FLOOR TO VERTICAL PIPE AS SHOWN.
2. 1-1/4" CD DN FROM ABOVE.
3. VRF PIPING MAINS SHOWN FOR REFERENCE AND IS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR PIPING DISTRIBUTION BETWEEN ACCU AND VRF'S FOR FINAL ROUTING AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.
4. ROUTE 2" CD DOWN AND DUMP TO MOP SINK.
5. ROUTE REFRIGERANT LINES FROM INDOOR UNIT TO OUTDOOR UNIT ON ADJACENT ROOF. SIZE REFRIGERANT LINES PER MANUFACTURER REQUIREMENTS.
6. ROUTE CD DN TO ROOF AND ROUTE TO NEAREST ROOF DRAIN.
7. VRF PIPING DOWN THROUGH PIPE PORTAL TO HOTEL LEVELS BELOW. SEE DETAIL ON SHEET M-503.
8. ROUTE REFRIGERANT LINES FROM OUTDOOR UNIT TO INDOOR UNIT IN MDF ROOM ON FLOOR BELOW. SIZE REFRIGERANT LINES PER MANUFACTURER REQUIREMENTS.
9. SPA HVAC EQUIPMENT SHOWN FOR REFERENCE ONLY, NOT INSTALLED AS PART OF THIS CONSTRUCTION DOCUMENTS.
10. ROUTE CONDENSATE DRAIN FROM ROOFTOP UNIT TO NEARBY ROOF DRAIN. SEE PLUMBING DRAWINGS FOR ROOF DRAIN LOCATION. SIZE CONDENSATE DRAIN TO MATCH UNIT PIPE CONNECTION.
11. ROUTE STEAM PIPING TO STEAM GENERATOR, REFER TO SPA DRAWINGS FOR MORE INFORMATION.
12. ROUTE STEAM PIPING TO STEAM ROOM, REFER TO SPA DRAWINGS FOR MORE INFORMATION,



1 HVAC PIPING - THIRD FLOOR LEVEL - AREA A
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

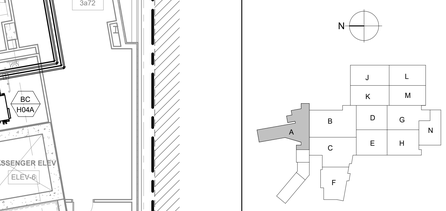
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KEY PLAN

BULLETIN 02
03/15/2023

ISSUE	01/31/2023	
JOB	30611.00	
DRAWN	MWM	
SCALE	As indicated	

REVISIONS

5	2023-0214	BULLETIN 01
6	2023-0315	BULLETIN 02

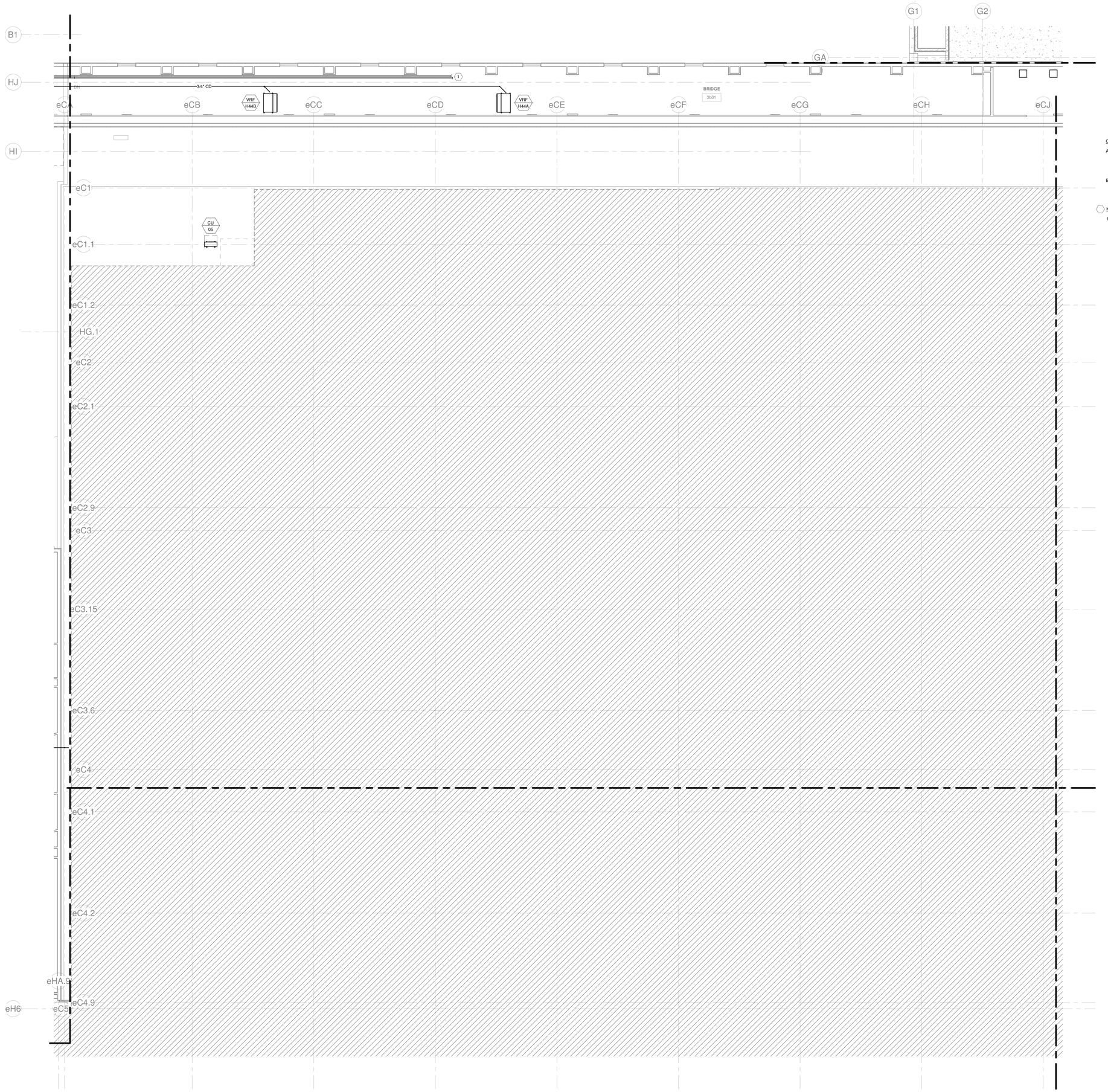
HVAC PIPING - THIRD FLOOR LEVEL - AREA A

MP-113A

3/14/2023 10:40:32 AM

DRAWING PRINTED FULL SIZE (30IN) × 24"x48" DRAWING PRINTED HALF SIZE (15IN) WILL FIT ON A SHEET 11"X24" WITH A 1/2" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED MEDIUM SHEET SIZE (22"X36") WILL FIT ON A SHEET 11"X17" WITH A 1/2" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED SMALL SHEET SIZE (20"X30") WILL FIT ON A SHEET 10"X15" WITH A 1/2" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED TABLOID SIZE (17"X11") WILL FIT EXACTLY ON A SHEET 11"X17". ARCHIVAL 12" X 18" SHEET SCALES WILL TRANSLATE BY HALF(50%) WHEN THE DIMENSIONS BY A MEASURING THE NUMBER ON 12 1/2 EXAMPLE: 1/8"=1'-0" (0.125) WILL BE SCALED AT 1/16"=1'-0" FOR SCALES AT 3/4", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1. 1:100(M1) 3/4"=1'-0" (0.75) WILL BE SCALED AT 3/4

7 DocuSign Envelope ID: 31C67779-8015-4E11-8D69-F10DFA204BA4



1 HVAC PIPING - THIRD FLOOR LEVEL - AREA B
1/8" = 1'-0"

GENERAL NOTES:

A. VRF PIPING MAINS SHOWN FOR GENERAL INTENT AND ROUTING. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR COMPLETE PIPING DISTRIBUTION AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.

B. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE. CONDENSATE PIPING SHOWN FOR GENERAL INTENT AND ROUTING.

KEYNOTES:

1. VRF PIPING MAINS SHOWN FOR REFERENCE AND IS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR PIPING DISTRIBUTION BETWEEN ACCU AND VRF'S FOR FINAL ROUTING AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.

Additions and Renovations to Harrah's Cherokee Valley River

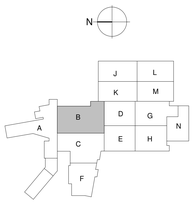
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KEY PLAN

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01/31/2023

NORTH CAROLINA PROFESSIONAL 039457 ENGINEER EDWARD DALTON
1/30/2023

ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	As indicated
REVISIONS	

HVAC PIPING - THIRD FLOOR LEVEL - AREA B

MP-113B

1/30/2023 11:27:40 AM DRAWING PRINTED FULL SIZE (30X42IN.) ON HP DESIGNJET T610 PS. IF DIFFERENT SIZE PAPER USED, ADJUST THE SCALE ACCORDINGLY. IF NOT ALL FOUR SIDES (DRAWING PRINTED HALF SIZE OR LESS) ARE PRINTED, THEN DO NOT USE THIS SCALE BAR. THE DRAWING FOR ANY DISCREPANCIES BEFORE PROCEEDING. DO NOT SCALE DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS ON THE JOB AND REPORT ANY DISCREPANCIES TO THE ARCHITECT

7 DocuSign Envelope ID: 31C67779-8015-4E11-8D69-F10DFA204BA4

GENERAL NOTES:

A. VRF PIPING MAINS SHOWN FOR GENERAL INTENT AND ROUTING. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR COMPLETE PIPING DISTRIBUTION AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.

B. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE. CONDENSATE PIPING SHOWN FOR GENERAL INTENT AND ROUTING.

KEYNOTES:

1. 1-1/4" CD DN FROM ABOVE. CONNECT CONDENSATE DRAIN FROM VRF UNIT(S) ON THIS FLOOR TO VERTICAL PIPE AS SHOWN.
2. 1-1/4" CD DN FROM ABOVE. CONNECT CONDENSATE DRAIN FROM HOTEL ROOM VTAC TO VERTICAL PIPE.
3. VRF PIPING MAINS SHOWN FOR REFERENCE AND IS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR PIPING DISTRIBUTION BETWEEN ACCU AND VRF'S FOR FINAL ROUTING AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.
4. VERTICAL VRF PIPING MAINS FROM ACCUs ON HOTEL HIGH ROOF.
5. MULTI-ZONE SYSTEM. ROUTE REFRIGERANT LINES FROM INDOOR UNITS TO OUTDOOR UNIT ON ADJACENT ROOF. SIZE REFRIGERANT LINES PER MANUFACTURER REQUIREMENTS.
6. ROUTE CD DN TO ROOF AND ROUTE TO NEAREST ROOF DRAIN.
7. ROUTE 3/4" CD DOWN AND DUMP TO MOP SINK.
8. ROUTE CONDENSATE DRAIN THROUGH WALL TO ICE MACHINE DRAIN. CONCEAL CONDENSATE AND REFRIGERANT PIPE WHERE EXPOSED TO VENDING ROOM WITH PAINT READY PIPE COVERS. PAINT COLOR TO BE SELECTED BY ARCHITECT.



1 HVAC PIPING - FOURTH FLOOR LEVEL - AREA A
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

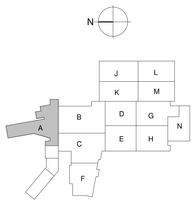
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KEY PLAN

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NORTH CAROLINA PROFESSIONAL 039457 ENGINEER EDWARD DALTON
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DRAWN	MWM
SCALE	As indicated
REVISIONS	

HVAC PIPING - FOURTH FLOOR LEVEL - AREA A

MP-114A

1/30/2023 11:27:48 AM DRAWING PRINTED FULL SIZE (18"x1") IF NOT 2500MM(100"H)X3 FT(36") (DPI) WILL FIT ON A SHEET IF NOT WITH 2.5" OF EXTRA SPACE ON ALL FOUR SIDES DRAWING PRINTED HEIGHT TIMES SIZE (27.5"x1.1"=121x1.5"=181) FIT TIGHTLY ON 1"x7" INDIVIDUAL 24", 26", 18", 12" AND 120" VIEW SCALES WILL TRANSLATE BY MAL 50% FACTOR (ENGINEMATOR BY KASE MARKS THE NUMBER FOR 1.5 EXAMPLE SET 1"=1'-0" (27.5"x1.1"=181) WILL BE 3/4"=1'-0" FOR SCALES AT 24", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE ENGINEMATOR EQUIVALENT AND CHANGE THE NUMERATOR TO 1.5 WHEN 1 3/4"=1'-0" AT

7 | DocuSign Envelope ID: 31C67779-8015-4E11-8D69-F10DFA204BA4

GENERAL NOTES:

A. VRF PIPING MAINS SHOWN FOR GENERAL INTENT AND ROUTING. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR COMPLETE PIPING DISTRIBUTION AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.

B. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE. CONDENSATE PIPING SHOWN FOR GENERAL INTENT AND ROUTING.

KEYNOTES:

1. 1-1/4" CD DN FROM ABOVE. CONNECT CONDENSATE DRAIN FROM VRF UNIT(S) ON THIS FLOOR TO VERTICAL PIPE AS SHOWN.
2. 1-1/4" CD DN FROM ABOVE. CONNECT CONDENSATE DRAIN FROM HOTEL ROOM VTAC TO VERTICAL PIPE.
3. VRF PIPING MAINS SHOWN FOR REFERENCE AND IS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR PIPING DISTRIBUTION BETWEEN ACCU AND VRF'S FOR FINAL ROUTING AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.
4. VERTICAL VRF PIPING MAINS FROM ACCUs ON HOTEL HIGH ROOF.
5. ROUTE 3/4" CD DOWN AND DUMP TO MOP SINK.
6. ROUTE CONDENSATE DRAIN THROUGH WALL TO ICE MACHINE. CONCEAL PIPE WHERE EXPOSED TO VENDING ROOM WITH PAINT READY PIPE COVERS. PAINT COLOR TO BE SELECTED BY ARCHITECT.



FLOOR PLAN SHOWN IS FIFTH FLOOR LEVEL, PIPING LAYOUT SHOWN IS TYPICAL FOR LEVELS 6 - 11

1 HVAC PIPING - FIFTH FLOOR LEVEL (TYPICAL FOR LEVELS 6 - 11) - AREA A
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

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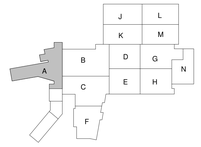
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KEY PLAN

PERMIT SET
01/31/2023

NORTH CAROLINA PROFESSIONAL 039457 ENGINEER EDWARD DALTON

ISSUE	12/22/2022
JOB	30611.00
DRAWN	MWM
SCALE	As indicated
REVISIONS	

HVAC PIPING - FIFTH FLOOR LEVEL - AREA A

MP-115A

1/30/2023 11:27:56 AM
DRAWING PRINTED FULL SIZE (30"H) - IF NOT 24X36IN PRINTED ON A2 SIZE (20L) PLOT, PLOT ON A SHEET 'B' NOT 30"H. 1'-0" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED TO SCALE. THIS SIZE (3" BLL = 1'-0") WILL BE 24"H X 2" FOR SCALES AT 24", 30", 1/16" AND 3/32". THE TRANSLATION IS CLOSE ENOUGH. TO USE THE DIMENSIONS ACCURATELY AND CHANGE THE NUMBERS ON 1, 3 SHEETS 24"H X 2" AT 3/16"=1'-0" SCALE WILL TRANSLATE AT #ALL SIN. FACTOR. DIMENSIONS BY 8 AND MARKING THE NUMBERS ON 3 SHEETS 24"H X 2" AT 1/8" AND 1/32

780

3/14/2023 10:40:38 AM

DRAWING PRINTED FULL SIZE (30X42) + 3/4"HP, DRAWING PRINTED HALF SIZE (15X21) WILL FIT ON A SHEET 1" BLOCK WITH 0.13" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15X21) WILL FIT ON A SHEET 1" BLOCK WITH 0.13" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALF SIZE (15"H) = 11"(X15.5" WILL FIT ITEMS VISIBLE IN THIS PRINT) INDIVIDUAL 1/2", 1/4", 1/16" AND 1/32" VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 2 AND MAKING THE NUMERATOR 2 OVER EXAMPLE: 3/4"=1'-0" (1/16) WILL BE 6/64"=1'-0"

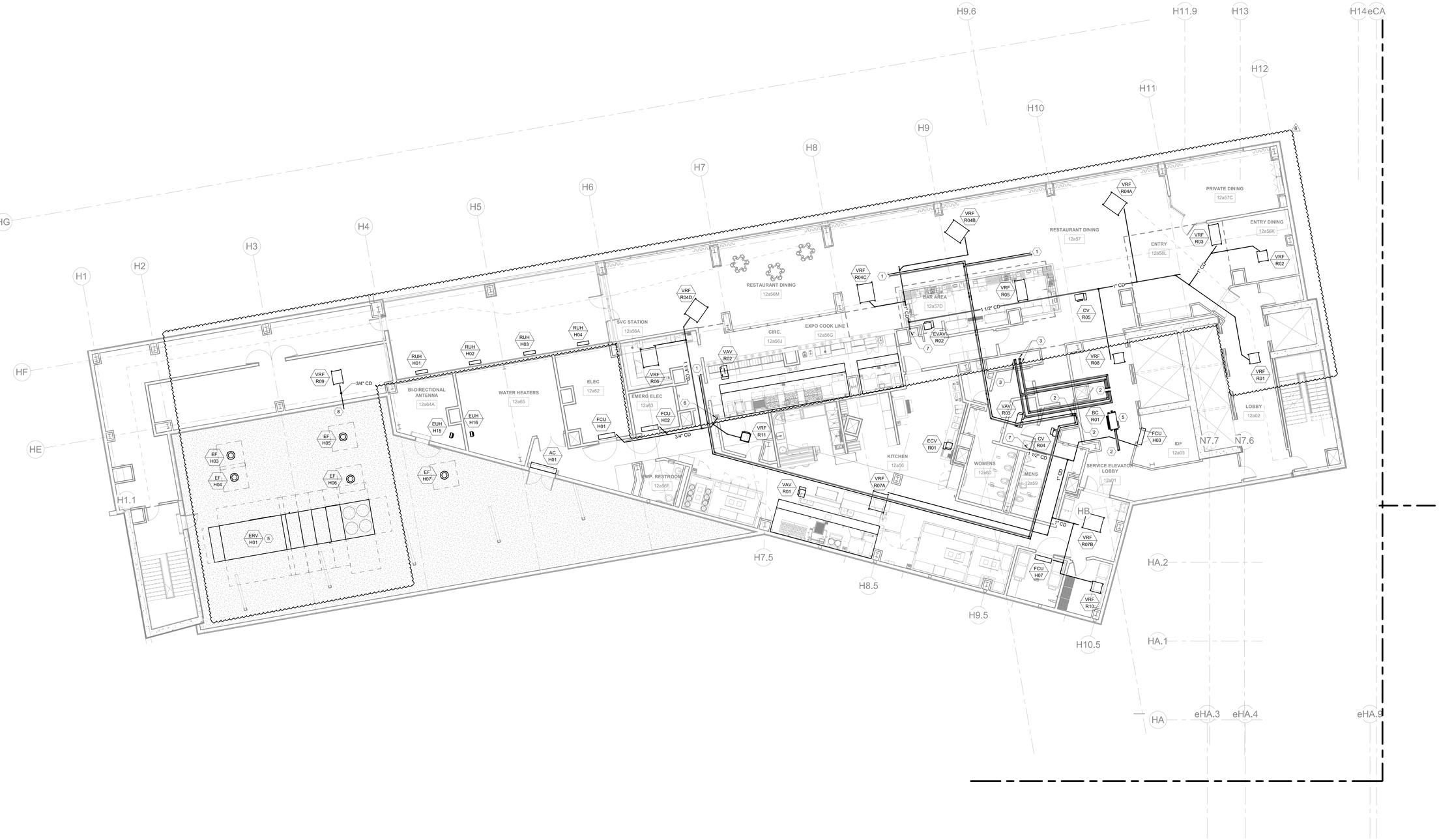
GENERAL NOTES:

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B. SLOPE CONDENSATE A MINIMUM OF 1/8" PER LINEAR FOOT TOWARD DRAIN. PROVIDE CLEANOUT AT CHANGES IN DIRECTION OF CONDENSATE PIPING. CONDENSATE PIPING SHALL MATCH UNIT CONNECTION SIZE. CONDENSATE PIPING SHOWN FOR GENERAL INTENT AND ROUTING.

KEYNOTES:

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2. VRF PIPING MAINS UP TO ACCUs ON ROOF ABOVE.
3. VRF VERTICAL PIPING MAINS DOWN TO HOTEL LEVELS.
4. VRF PIPING MAINS FROM ACCU TO BC SHOWN FOR REFERENCE AND IS SHOWN FOR GENERAL INTENT ONLY. CONTRACTOR TO COORDINATE WITH VRF MANUFACTURER FOR PIPING DISTRIBUTION BETWEEN BC AND VRF'S FOR FINAL ROUTING AND PIPE LENGTHS. REFRIGERANT PIPING TO BE SIZED BY VRF MANUFACTURER.
5. ROUTE CONDENSATE DRAIN FROM ROOFTOP UNIT TO NEARBY ROOF DRAIN. SEE PLUMBING DRAWINGS FOR ROOF DRAIN LOCATION. SIZE CONDENSATE DRAIN TO MATCH UNIT PIPE CONNECTION.
6. ROUTE 1" CD DOWN AND DUMP TO FLOOR SINK.
7. ROUTE 1-1/2" CONDENSATE AND DUMP TO MOP SINK.
8. DUMP CONDENSATE TO ROOF WITH SPLASH BLOCK.



1 HVAC PIPING - TWELFTH FLOOR LEVEL
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

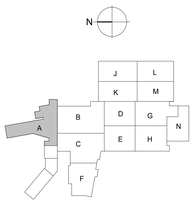
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KEY PLAN

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JOB	30611.00
DRAWN	MWM
SCALE	As indicated

REVISIONS

5	2023-0214	BULLETIN 01
6	2023-0315	BULLETIN 02

HVAC PIPING - TWELFTH FLOOR LEVEL

MP-122

780

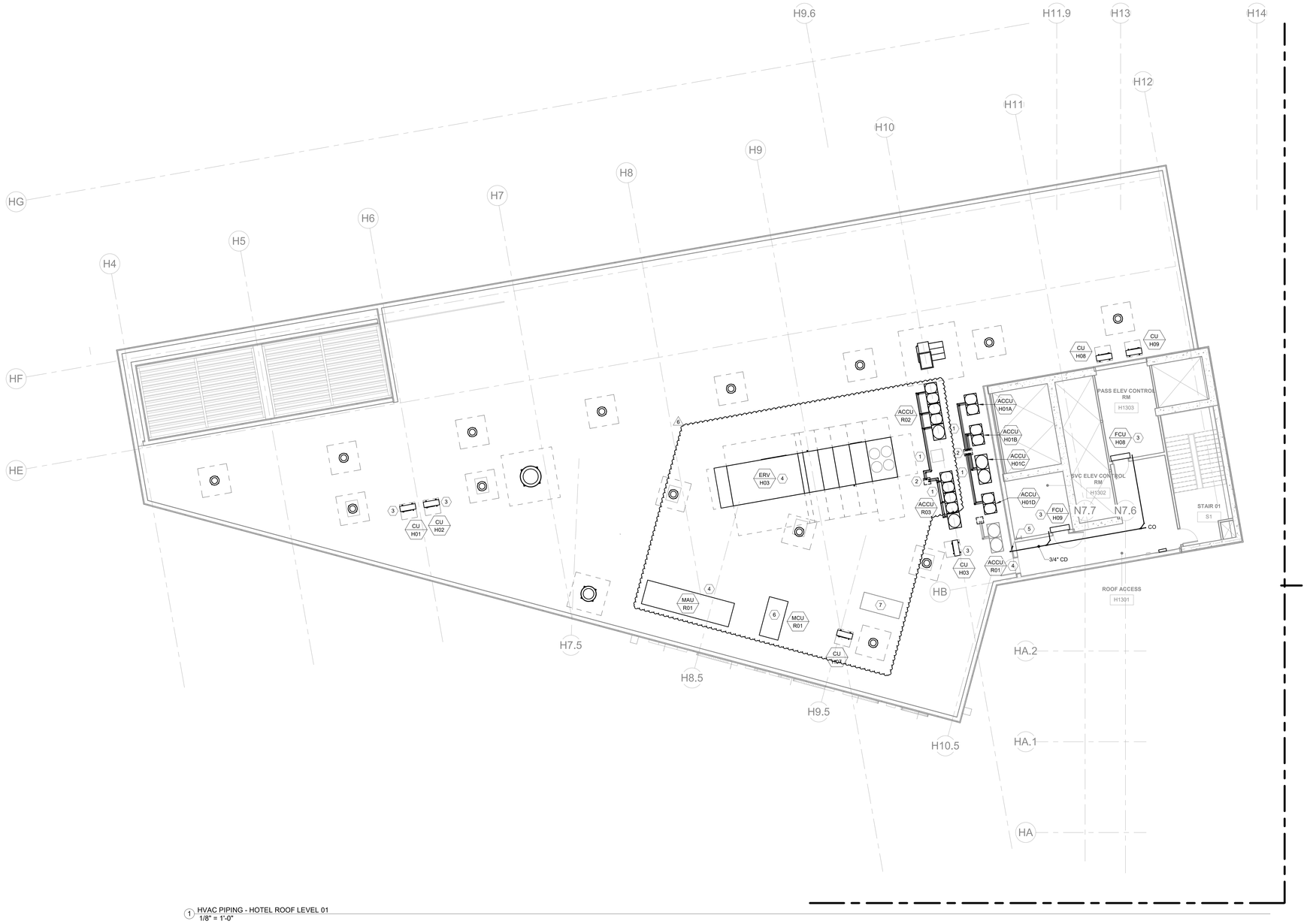
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2. VRF PIPING DOWN THROUGH PIPE PORTAL TO HOTEL LEVELS BELOW. SEE DETAIL ON SHEET M-503.
3. ROUTE REFRIGERANT LINES FROM INDOOR UNIT TO OUTDOOR UNIT. SIZE REFRIGERANT LINES PER MANUFACTURER REQUIREMENTS.
4. ROUTE CONDENSATE DRAIN FROM ROOFTOP UNIT TO NEARBY ROOF DRAIN. SEE PLUMBING DRAWINGS FOR ROOF DRAIN LOCATION. SIZE CONDENSATE DRAIN TO MATCH UNIT PIPE CONNECTION.
5. DUMP CONDENSATE TO ROOF WITH SPLASH BLOCK.
6. ROUTE REFRIGERANT LINES FROM CONDENSING UNIT TO MAKE-UP AIR UNIT. SIZE REFRIGERANT LINES PER MANUFACTURER REQUIREMENTS.
7. OMNI TEMP REFRIGERATION RACK PROVIDED BY OTHERS. COORDINATE WITH ALL TRADES PRIOR TO FINALIZING LOCATION. SEE FOOD SERVICE PLANS FOR MORE INFORMATION.



1 HVAC PIPING - HOTEL ROOF LEVEL 01
1/8" = 1'-0"

Additions and Renovations to Harrah's Cherokee Valley River

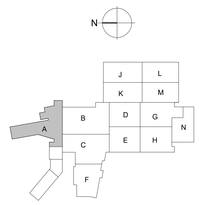
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KEY PLAN

BULLETIN 02
03/15/2023

ISSUE 01/31/2023
JOB 30611.00
DRAWN MWM
SCALE As indicated

REVISIONS

5	2023-0214	BULLETIN 01
6	2023-0315	BULLETIN 02

HVAC PIPING - HOTEL ROOF LEVEL 01

MP-123

3/14/2023 10:40:41 AM

DRAWING PRINTED FULL SIZE (100%) • 24"x36" DRAWING PRINTED HALF SIZE (50%) WILL FIT ON A SHEET 24"x36" WITH 1.5" OF EXTRA SPACE ON ALL FOUR SIDES. DRAWING PRINTED HALVES SIZE (21%) = 11.25"x15.5" WILL FIT TIGHTLY ON 11"x17" ROUGHDUAL 12", 14", 18", 1/16" VIEW SCALES WILL TRANSLATE BY MULTIPLYING THE DENOMINATOR BY 8 AND MAKING THE NUMERATOR 1. FOR EXAMPLE 1/8"=1'-0" AT (12.5%) WILL BE SAME AS 1"=8'-0" FOR SCALES AT 24", 36", 1/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DISSIMILAR AND CHANGE THE NUMERATOR TO 1. 1/32ARE 3/4"=1'-0" AT (3.1%) WILL BE SAME AS 1"=32'-0" FOR SCALES AT 24", 36", 3/16" AND 3/32" THE TRANSLATION IS CLOSE ENOUGH TO USE THE DENOMINATOR DISSIMILAR AND CHANGE THE NUMERATOR TO 1. 1/32ARE 3/4"=1'-0" AT (2.1%) WILL BE SAME AS 1"=48'-0"