MECHANICAL	SYMBOL LIS	ST		ME
NOTE: THIS IS A MASTER SCHEDULE. NOT ALL SYMBOL	S CONTAINED HEREIN MAY	APPEAR ON THE DRAWINGS.		NOTE: THIS IS A MASTER SCH
ITEM TO BE REMOVED POINT OF CONNECTION/DISCONNECTION SHEET NOTE REVISION NUMBER EQUIPMENT MARK DIFFUSER TAG ACCESS PANEL SUPPLY AIR DUCT UP/DOWN RETURN AIR DUCT UP/DOWN RETURN AIR DUCT UP/DOWN RETURN GRILLE EXHAUST GRILLE 4-WAY BLOW SUPPLY DIFFUSER 3-WAY BLOW SUPPLY DIFFUSER 1-WAY BLOW SUPPLY DIFFUSER AIRFLOW DIRECTION ROUND DUCTWORK (INCHES)		CHILLED WATER RETURN PIPING CHILLED WATER SUPPLY PIPING CONDENSER WATER RETURN PIPING CONDENSER WATER SUPPLY PIPING HEATING WATER RETURN PIPING HEATING WATER SUPPLY PIPING REFRIGERANT LIQUID PIPING REFRIGERANT SUCTION PIPING CONDENSATE DRAIN PIPING CONDENSATE DRAIN PIPING CONDENSATE DRAIN PIPING CIRCUIT SETTER 2-WAY ELECTRONIC CONTROL VALVE 3-WAY ELECTRONIC CONTROL VALVE 3-WAY PNEUMATIC CONTROL VALVE SOLENOID VALVE BUTTERFLY VALVE PLUG VALVE BALL VALVE CHECK VALVE	ACD AFF AP ASHRAE ASPE AV AW BFD BHP BTUH CD CFM CHAR CHR CHS CO CR CS CW D DB DDC DIA DN DX (E) EA EAT EC ESP EWT °F FCO FD FPM FSD	AMERICAN AIR BALANCE COUNCIL AUTOMATIC CONTROL DAMPER ABOVE FINISHED FLOOR ACCESS PANEL AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS AMERICAN SOCIETY OF PLUMBING ENGINEERS ACID VENT ACID WASTE BACKFLOW PREVENTION DEVICE BRAKE HORSEPOWER BRITISH THERMAL UNIT PER HOUR CONDENSATE DRAIN CUBIC FEET PER MINUTE CHARACTERISTICS CHILLED WATER RETURN CHILLED WATER RETURN CONDENSER WATER SUPPLY CLEANOUT CONDENSER WATER SUPPLY CLEANOUT CONDENSER WATER SUPPLY CLOU WATER DATE DRAIN DRY BULB TEMPERATURE DIRECT DIGITAL CONTROL DIAMETER DOWN DIRECT EXPANSION EXISTING TO REMAIN EXHAUST AIR ENTERING AIR TEMPERATURE ELECTRICAL CONTRACTOR ENERGY EFFICIENCY RATIO EFFICIENCY ELECTRICAL EXTERNAL STATIC PRESSURE ENTERING WATER TEMPERATURE FAHRENHEIT FLOOR CLEANOUT FIRE DAMPER FEET PER MINUTE FIRE/ SMOKE DAMPER GAS
ROUND FLEXIBLE DUCT SQUARE TO ROUND TRANSITION SINGLE LINE RIGID DUCT SINGLE LINE RIGID DUCT (ACOUSTICALLY LINED) DOUBLE LINE RIGID DUCT (ACOUSTICALLY LINED) EXISTING DUCTWORK FIRE DAMPER SMOKE DAMPER FIRE/SMOKE DAMPER MOTORIZED DAMPER (OPPOSED BLADE TYPE) MOTORIZED DAMPER (PARALLEL BLADE TYPE) BACKDRAFT DAMPER REMOTE VOLUME DAMPER REMOTE VOLUME DAMPER SMOKE DETECTOR THERMOSTAT HUMIDISTAT SENSOR CARBON DIOXIDE SENSOR CARBON DIOXIDE SENSOR DOOR UNDERCUT FLOW SWITCH		HOSE END DRAIN VALVE PRESSURE REDUCING VALVE RELIEF VALVE TEMPERATURE PRESSURE RELIEF VALVE THERMOMETER PRESSURE GAUGE WITH GAUGE COCK MANUAL AIR VENT PRESSURE TEMPERATURE PORT Y-STRAINER WITH BLOWDOWN PIPE GUIDE UNION PIPE GUIDE UNION FIPE ANCHOR FLEXIBLE CONNECTOR PIPE CAP/STUB-OUT DIRECTION OF FLOW PIPE UP PIPE TEE UP PIPE TEE UP	GA	MECHANICAL ABBREVIATIONS AND SYMBO MECHANICAL ABBREVIATIONS AND SYMBO MECHANICAL ABBREVIATIONS AND SYMBO MECHANICAL SPECIFICATIONS MECHANICAL SPECIFICATIONS MECHANICAL SCHEDULES MECHANICAL CONTROLS DIAGRAMS MECHANICAL DIAGRAMS MECHANICAL CONTROLS DIAGRAMS MECHANICAL CONTROLS DIAGRAMS MECHANICAL CONTROLS DIAGRAMS MECHANICAL CONTROLS DEQUENCES MECHANICAL CONTROLS POINTS MECHANICAL CONTROLS POINTS MECHANICAL PIPING DIAGRAMS MECHANICAL ENLARGED FLOOR PLAN - GA MECHANICAL ENLARGED FLOOR PLAN - SC MECHANICAL ENLARGED FLOOR PLAN - SC MECHANICAL ENLARGED FLOOR PLAN - BC MECHANICAL PIPING ENLARGED FLOOR PLAN - SC MECHANICAL PIPING ENLARGED PLAN - SC MECHANICAL

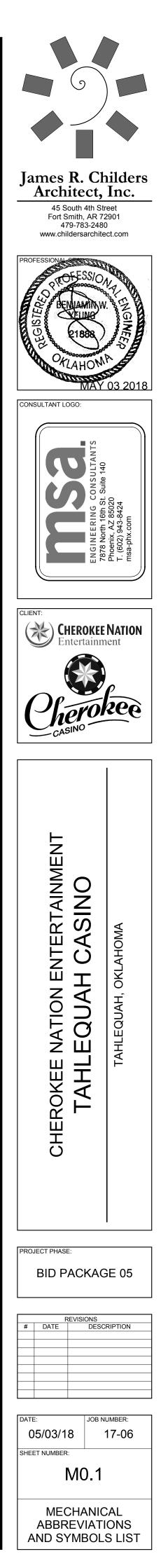
## **MECHANICAL ABBREVIATIONS**

THIS IS A MASTER SCHEDULE. NOT ALL ABBREVIATIONS CONTAINED HEREIN MAY APPEAR ON THE DRAWINGS.

000			
GCO	GRADE CLEANOUT	PD	PRESSURE DROP
GI	GREASE INTERCEPTOR	PRV	PRESSURE REDUCING VALVE
GPF	GALLONS PER FLUSH	PSI	POUNDS PER SQUARE INCH
GPM	GALLONS PER MINUTE	PSIA	POUNDS PER SQUARE INCH ABSOLUTE
GR	GLYCOL RETURN	PSID	POUNDS PER SQUARE INCH
GS	GLYCOL SUPPLY		DIFFERENTIAL
GW	GREASE WASTE	PSIG	POUNDS PER SQUARE INCH GAUGE
HD	HEAD		EXISTING TO BE RELOCATED
		(R)	
HP	HORSEPOWER	RA	
HPG	HIGH PRESSURE GAS	RH	RELATIVE HUMIDITY
HR	HOUR	RL/S	REFRIGERANT LIQUID/SUCTION
HSPF	HEATING SEASONAL PERFORMANCE	RPM	REVOLUTIONS PER MINUTE
	FACTOR	RPPA	REDUCED PRESSURE PRINCIPAL
HW	HOT WATER		ASSEMBLY
HWR	HEATING HOT WATER RETURN	RVD	REMOTE VOLUME DAMPER
HWS	HEATING HOT WATER SUPPLY	SA	SUPPLY AIR
IBC	INTERNATIONAL BUILDING CODE	SD	SMOKE DAMPER
IE	INVERT ELEVATION	SEER	SEASONAL ENERGY EFFICIENCY RATIO
IMC	INTERNATIONAL MECHANICAL CODE	SOI	SAND OIL INTERCEPTOR
IPC	INTERNATIONAL MECHANICAL CODE	"SP	
			STATIC PRESSURE (INCHES OF W.C.)
KW	KILOWATT	SPECS	SPECIFICATIONS
LAT	LEAVING AIR TEMPERATURE	SQ	SQUARE
LBS	POUNDS	SQFT	SQUARE FEET
LWT	LEAVING WATER TEMPERATURE	SS	STAINLESS STEEL
MAX	MAXIMUM	Т	TEMPERATURE
MBH	ONE THOUSAND BTUH	TAB	TEST AND BALANCE REPORT
MCA	MINIMUM CIRCUIT AMPS	TSP	TOTAL STATIC PRESSURE
MIN	MINIMUM	TW	TEMPERED WATER
MOCP	MAXIMUM OVERCURRENT PROTECTION	TYP	TYPICAL
MPG	MEDIUM PRESSURE GAS	UBC	UNIFORM BUILDING CODE
MVD	MANUAL VOLUME DAMPER	UMC	UNIFORM MECHANICAL CODE
N/A	NOT APPLICABLE	UON	UNLESS OTHERWISE NOTED
NC	NORMALLY CLOSED	UPC	UNIFORM PLUMBING CODE
NEBB	NATIONAL ENVIRONMENTAL	V	VENT
INEDD	BALANCING BUREAU	V/PH/HZ	
			VOLTAGE/PHASE/HERTZ
NEC	NATIONAL ELECTRIC CODE	VFD	VARIABLE FREQUENCY DRIVE
NFPA	NATIONAL FIRE PROTECTION	VTR	VENT THROUGH ROOF
	ASSOCIATION	WB	WET BULB TEMPERATURE
NIC	NOT IN CONTRACT	WCO	WALL CLEANOUT
NO	NORMALLY OPEN	WG	WATER GUAGE
NTS	NOT TO SCALE	WMS	WIRE MESH SCREEN
OA	OUTSIDE AIR	(X)	EXISTING TO BE REMOVED
OAT	OUTSIDE AIR TEMPERATURE		
OBD	OPPOSED BLADE DAMPER		
OED	OPEN END DUCT		
OFCI	OWNER FURNISHED, CONTRACTOR		
	INSTALLED		

MECHANICAL - DRAWING INDEX				
SHEET NAME	05/03/18 - BID PACKAGE 05	MM.DD.YYYY	MM.DD.YYYY	MM.DD.YYYY
BREVIATIONS AND SYMBOLS LIST	X			
ECIFICATIONS	X			
HEDULES	X			
GRAMS	X			
GRAMS	X			
NTROLS DIAGRAMS	X			
NTROLS SEQUENCES	X			
NTROLS POINTS	X			
ING DIAGRAMS	X	-		
ERALL FLOOR PLAN	X			
LARGED FLOOR PLAN - GAMING	X	-		
ARGED FLOOR PLAN - SOUTH	X	-		
LARGED FLOOR PLAN - BOH	X	1		1
LARGED FLOOR PLAN - BANQUET BOH	X			
LARGED FLOOR PLAN - NORTH	X			
ING ENLARGED FLOOR PLAN - GAMING	X	-		1
ING ENLARGED PLAN - SOUTH	X	1		
ING ENLARGED PLAN - BOH	X	-		
ING ENLARGED PLAN - BANQUET BOH	X			
ING ENLARGED PLAN - NORTH	X	+		
OF PLAN	X		-	+'

TOTAL: 25



### PART ONE - GENERAL

- 1. THE OWNER HAS CONTRACT LANGUAGE THAT NEEDS TO BE READ PRIOR TO BID SUBMISSION AS THERE ARE ITEMS THAT MAY SUPPLEMENT OR SUPERSEDE ITEMS NOTED HEREIN. THE OWNER'S CONTRACT DOCUMENTS HAS INFORMATION ON HOW WORK IS TO BE PERFORMED, HOW DOCUMENT SUBMITTALS ARE PROVIDED, RECORD DOCUMENTS ARE SUBMITTED, ETC. SEE THE ARCHITECTURAL DOCUMENTS FOR ADDITIONAL DIVISION 1 INFORMATION.
- CODE USED IN DESIGN: IBC 2012, IMC 2012, IPC-2012, UMC-2012, UPC-2012, IECC-2012, IFGC 2012
- 3. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST ADOPTED EDITIONS OF THE APPLICABLE INTERNATIONAL BUILDING CODE (IBC), LOCAL MECHANICAL CODE (UMC, IMC, ETC.), LOCAL PLUMBING CODE (UPC, IPC, ETC.), NATIONAL ELECTRIC CODES (NEC) AND ALL OTHER APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
- 4. THE CONTRACTOR MUST ARRANGE A VISIT TO THE WORK SITE PRIOR TO BID SUBMISSION TO FULLY UNDERSTAND THE EXISTING CONDITIONS. THE DRAWINGS ARE DIAGRAMMATIC AND SHOW THE WORK INTENT BUT NOT NECESSARILY ALL EXISTING OBSTRUCTIONS, PIPE OR DUCT BENDS. DETERMINING SITE CONDITIONS AND ADJUSTING THE INSTALLATION IS THE RESPONSIBILITY OF THE CONTRACTOR
- THE CONTRACTOR SHALL PROVIDE THE WORK SHOWN ON THE DRAWINGS AND SPECIFIED FOR THEIR INDIVIDUAL SECTIONS OF WORK. THE WORD "WORK" SHALL MEAN ALL LABOR. TRANSPORTATION. MATERIAL, EQUIPMENT, TOOLS, INSTALLATION. SUPERVISION AND ANY OTHER INCIDENTAL ITEMS OR SERVICES NECESSARY FOR THE PROPER INSTALLATION AND OPERATION OF THE COMPLETE SYSTEMS, WHICH SHALL BE PROVIDED WHETHER OR NOT SPECIFICALLY INDICATED OR NOTED.
- 6. ALL GENERAL CONDITIONS, SPECIAL REQUIREMENTS OR GENERAL REQUIREMENTS OF THE CONSTRUCTION SPECIFICATIONS ARE MADE PART OF THIS SPECIFICATION AND HAVE THE SAME FORCE AND AFFECT AS IF COMPLETELY REPRODUCED.
- THE WORD "PROVIDE" SHALL MEAN FURNISH AND INSTALL, MAKE ALL FINAL
- CONNECTIONS AND LEAVE IN AN APPROVED COMPLETE OPERATING CONDITION. 3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYING ALL FEES AND OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR THE WORK.
- 9. THE CONTRACTOR SHALL CAREFULLY EXAMINE ALL CONTRACT DOCUMENTS. THE CONTRACTOR SHALL COORDINATE THE WORK WITH ALL OTHER TRADES INCLUDING BUT NOT LIMITED TO, THE CONTRACT DOCUMENTS, SHOP DRAWINGS, ETC. FOR ALL GENERAL CONSTRUCTION, STRUCTURAL, MECHANICAL, ELECTRICAL AND SPECIALTY CONTRACTOR WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER FITTING OF MATERIAL INTO THE BUILDING AS PLANNED, WITHOUT INTERFERENCE WITH OTHER WORK, AND SHALL MAKE REASONABLE MODIFICATIONS IN THE LAYOUTS NEEDED TO PREVENT CONFLICT WITH OTHER TRADES, TO PROVIDE ACCESS AND FOR THE PROPER EXECUTION OF THE WORK.
- 0. DRAWINGS ARE DIAGRAMMATIC AND SCHEMATIC IN NATURE, AND INDICATE THE TYPE, SIZE, ARRANGEMENT AND LOCATION OF MATERIALS AND EQUIPMENT. WORK INCLUDES CERTAIN COMPONENTS, APPURTENANCES AND RELATED SPECIALTIES THAT MAY NOT BE SHOWN. CONTRACTOR SHALL PROVIDE ALL NECESSARY ITEMS TO COMPLETE THE WORK ACCORDING TO INDUSTRY STANDARDS. IT IS THE INTENT OF THE DRAWINGS AND SPECIFICATIONS TO CALL OUT FOR FINISHED WORK, TESTED AND READY FOR OPERATION. DO NOT SCALE DRAWINGS. ARRANGEMENT OF EQUIPMENT AND ROUTING OF PIPES AND DUCTWORK, ETC. INDICATED ON DRAWINGS SHALL BE ROUTED PLUMB AND AT RIGHT ANGLES TO BUILDING CONSTRUCTION AND MAY REQUIRE MODIFICATION DUE TO UNFORESEEN CONDITIONS AND REQUIRE ON SITE REVISIONS DURING CONSTRUCTION. (SEE ALSO "BIDDING").
- 11. ALL WORK REQUIRED FOR IDENTICAL/SIMILAR ITEMS SHOWN ON THE DRAWINGS SHALL BE PROVIDED, ALTHOUGH EACH SPECIFIC IDENTICAL/SIMILAR ITEM MAY NOT **BE SHOWN IN DETAIL**
- 12. THE CONTRACTOR SHALL SUBMIT ELECTRONIC PDF SHOP DRAWINGS AND TECHNICAL DATA SHEETS FOR ALL EQUIPMENT AND MATERIALS SPECIFIED HEREIN TO THE ENGINEER. THE ENGINEER SHALL REVIEW SHOP DRAWINGS AND TECHNICAL DATA SHEETS FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS AND ISSUE A WRITTEN ASSESSMENT TO THE OWNER PRIOR TO COMMENCEMENT OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ENGINEERING FEES NECESSARY TO CHANGE PERMIT DOCUMENTS BASED ON ALTERNATE SUBMITTAL PACKAGES/EQUIPMENT SUBSTITUTIONS
- 13. ALL SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER FOR CONSIDERATION PRIOR TO BIDDING. THE OWNER'S REPRESENTATIVE SHALL PREAPPROVE ANY PROPOSED SUBSTITUTION IN WRITING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIREMENTS ASSOCIATED WITH SUBSTITUTED EQUIPMENT OR MATERIALS WITH OTHER BUILDING TRADES, INCLUDING ALL ELECTRICAL, STRUCTURAL, OR ARCHITECTURAL ELEMENTS. (SHOP DRAWING REVIEW DOES NOT RELIEVE THE CONTRACTOR FROM SUBSTITUTE EQUIPMENT COORDINATION REQUIREMENTS.) SUBSTITUTED EQUIPMENT, ANYTHING DIFFERENT FROM SPECIFIED ON THE DOCUMENTS, MUST BE IDENTIFIED AS SUCH DURING THE SUBMITTAL PROCESS. THE CONTRACTOR SHALL IDENTIFY AND ANNOTATE ALL REVISED REQUIREMENTS PER BUILDING TRADE ON THE SHOP DRAWINGS. THE CONTRACTOR SHALL ALSO IDENTIFY ALL COST DEBITS OR CREDITS IN WRITING FOR THE PROPOSED CHANGES PER BUILDING TRADE.
- 14. UPON COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL SUPPLY THE ENGINEER WITH AN ELECTRONIC CAD AND PDF SET OF AS-BUILT DOCUMENTS ACCURATELY SHOWING THE MATERIALS AND EQUIPMENT AS INSTALLED.
- 15. ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR A MINIMUM OF ONE (1) YEAR FROM DATE OF ACCEPTANCE BY OWNER. REFRIGERATION COMPRESSORS SHALL BE GUARANTEED FOR A MINIMUM OF FIVE (5) YEARS FROM DATE OF OWNER'S ACCEPTANCE. IN ADDITION, THE CONTRACTOR SHALL GUARANTEE THAT THE INSTALLATION WHEN OPERATED IN ACCORDANCE WITH THE CONTRACTOR'S INSTRUCTIONS WILL DEVELOP CAPACITY AND CHARACTERISTICS AS SPECIFIED AND WILL FULFILL EACH AND EVERY REQUIREMENT OF THE DRAWINGS AND SPECIFICATIONS. SHOULD THE INSTALLATION IN ANY WAY FAIL TO DO SO, THE CONTRACTOR WILL, WITHOUT DELAY OR WITHOUT COST TO THE OWNER, PROVIDE WHATEVER ADDITIONAL EQUIPMENT, MATERIAL, AND LABOR REQUIRED TO CORRECT THE DEFICIENCY AND COMPLY WITH THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS.
- 16. CONTRACTOR SHALL CHECK AND VERIFY ALL SIZES, DIMENSIONS, AND CONDITIONS BEFORE STARTING ANY WORK. ANY DEVIATIONS OR PROBLEMS SHALL BE TRANSMITTED TO THE ENGINEER FOR REVIEW.
- 17. PROVIDE BASE AND COUNTER FLASHING FOR ITEMS PENETRATING THE ROOF OR EXTERIOR WALLS.
- 18. STARTERS, VFDs DISCONNECT SWITCHES AND CONTROLS FOR MOTORS IF NOT UNIT MOUNTED AND/OR SUPPLIED BY THE EQUIPMENT MANUFACTURER, UNLESS NOTED SPECIFICALLY OTHERWISE SHALL FOLLOW:
- 18.1. VFDs TO BE SUPPLIED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. FINAL LOCATIONS COORDINATED WITH THE ENGINEER. WIRING BETWEEN THE VFD AND THE MOTOR SHALL BE SHIELDED POWER CABLE DESIGNED FOR VFD APPLICATIONS, GROUNDED AT BOTH
- 18.2. UNLESS NOTED OTHERWISE, LOOSE MOTOR STARTERS, COMBINATION STARTERS, DISCONNECT SWITCHES, MOTOR RATED SWITCHES, TOGGLE SWITCHES, ETC. TO BE SUPPLIED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
- 18.3. CONTROL AND INTERLOCKING WIRING SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR PERFORMING CONTROLS WORK. (SEE AUTOMATIC TEMPERATURE CONTROLS SECTION FOR ADDITIONAL INFORMATION WITH REGARD TO THIS WIRING RULE.)
- 19. ALL WORK SHOWN IS NEW UNLESS NOTED OTHERWISE.
- 20. MAINTAIN OCCUPANCY AND FIRE WALL SEPARATION INTEGRITY AS REQUIRED. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS OF ALL OCCUPANCY/FIREWALL SEPARATIONS AND SPECIFIC DETAILS FOR CONSTRUCTION. PROVIDE ALL NECESSARY FIRE AND SMOKE FIRE DAMPERS, ACCESS DOORS, CAULKING, ETC. FOR APPROVED INSTALLATION.
- 21. IECC COMPLIANCE: THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH AND PERFORMING ALL REQUIREMENTS AND WORK SET FORTH IN THE IECC COMPLIANCE CERTIFICATE THAT IS INCLUDED IN THESE DOCUMENTS.

### COORDINATION DRAWINGS

1. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR CREATING "ALL TRADES" COORDINATION DRAWINGS. THIS WORK APPLIES TO ABOVE SHAFTS AND ON THE ROOF. THESE DRAWINGS ARE TO BE PREPARE REVIT. 2D AUTOCAD DRAWINGS WILL BE AVAILABLE FROM THE DESIG CAN BE UTILIZED TO ASSIST IN THE PREPARATION OF THE COORDINA DRAWINGS. THESE DRAWINGS SHALL BE COMPLETED PRIOR TO WOR INSTALLED IN THE FIELD FOR THE LOCATIONS NOTED ABOVE. AS-BUI DOCUMENTS ARE NOT AVAILABLE FOR THE WORK LOCATION. THE C WILL NEED TO PERFORM FIELD WORK TO LOCATE STRUCTURAL CONS EXISTING SERVICES THAT ARE REQUIRED TO REMAIN SO THAT ACCUR DOCUMENTS CAN BE CREATED. THE ENGINEER WILL ASSIST WHERE HELP IDENTIFY EQUIPMENT THAT NEEDS TO STAY WITHIN THE CEILING SERVICE OTHER SPACES. EACH TRADE INVOLVED IS TO PROVIDE THI DOCUMENTS, IN AUTOCAD FORMAT, TO THE MECHANICAL CONTRACT INSERTION TO THE COMMON FILE. (DURING THE BID PROCESS THE M CONTRACTOR IS TO ENSURE THE GC IS AWARE OF THIS WORK WHER RESPONSIBLE CHARGE.) THE OWNER MAY PRE-PURCHASE THE SERV SPRINKLER AGENCY, BUT THE INSTALLATION OF THE SPRINKLER PIPI REGARD TO SCHEDULE, LOCATION AND INSTALLATION WILL FALL UNE DIRECTION OF THE GC AND SPRINKLER PIPING MUST BE INCLUDED IN COORDINATION DOCUMENTS. AT A MINIMUM THE FOLLOWING TRADE INVOLVED IN THE COORDINATION DRAWINGS: MECHANICAL, PLUMBIN ELECTRICAL, LOW VOLTAGE, BAS, SPRINKLER, CARPENTRY, ANY OTH WILL WORK IN THE AFFECTED AREAS.

### BIDDING

- 1. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID FAMILIAR WITH THE EXISTING CONDITIONS. THE CONTRACTOR SHALL THE WORK SPECIFIED IN THE CONTRACT DOCUMENTS WITH THE EXIS CONDITIONS. THE CONTRACTOR SHALL IDENTIFY AND NOTATE ALL W CONDITIONS THAT ARE DIFFERENT FROM THE CONTRACT DOCUMENT INTENT. THE CONTRACTOR SHALL, UPON DISCOVERY, IMMEDIATELY REPORT, IN WRITING, ANY DISCREPANCIES TO THE ENGINEER. NO E CHANGE ORDERS WILL BE ALLOWED FOR FAILURE TO PERFORM THE VISIT
- . BASE PROPOSAL ON MANUFACTURER NAMES LISTED UNLESS "OR EQ INDICATED. PROVIDE SUBSTITUTION REQUESTS A MINIMUM OF FIVE DAYS PRIOR TO BID DATE CLOSING TO ALLOW TIME FOR DUE CONSID PROPOSED ALTERNATE. DETERMINATION OF SUBSTITUTION OF EQUA SOLELY WITH THE ENGINEER.

### PART TWO - PRODUCTS HVAC EQUIPMENT

1. PROVIDE HVAC EQUIPMENT AS SPECIFIED AND/OR SCHEDULED HERE ACCORDANCE WITH MANUFACTURER'S PUBLISHED INSTALLATION IN EQUIPMENT SHALL OPERATE ACCORDING TO THE MANUFACTURER'S OPERATING AND MAINTENANCE MANUAL" TROUBLE-FREE PRIOR TO AND BALANCE (TAB) WORK.

### DUCTWORK

- 1. DUCTWORK, UNLESS LISTED OTHERWISE IN THIS SECTION, SHALL BE A653/A653M GALVANIZED SHEET METAL, LOCK-FORMING QUALITY HAV COATING OF 0.90 OZ PER SQ. FT. (G90) EQUALLY APPLIED TO EACH SL TESTED PER ASTM A90. DUCTWORK IS TO BE INSTALLED ACCORDING RECOMMENDATIONS AND SMACNA DUCT CONSTRUCTION STANDARD SHEETMETAL DUCTWORK TO BE LESS THAN 26 GA.
- 2. ROUND DUCTWORK: 8"Ø AND UNDER CAN BE SPIRAL OR SNAP-LOCK, SPIRAL CONSTRUCTION.
- PROVIDE MANUAL VOLUME DAMPERS WITH LOCKING QUADRANTS AN RIBBONS AT DAMPER HANDLES FOR AIR BALANCING EACH BRANCH D OR PIECE OF AIR DISTRIBUTION EQUIPMENT. NOT ALL DAMPERS MAY ON THE DOCUMENTS.
- 4. SEAL ALL DUCT PENETRATIONS THROUGH WALLS, FLOOR AND ROOF TRANSVERSE DUCT SEAMS WITH APPROVED MASTIC. DUCT TAPES S ALLOWED FOR RIGID DUCTWORK.
- 5. SUPPLY, OUTSIDE AIR AND RETURN DUCTWORK SHALL BE INSULATED FLEXIBLE GLASS FIBER INSULATION MEETING ANSI/ASTM C612, MAXIM OF 0.29 AT 75°F, WITH FOIL-KRAFT FLAME RESISTANT VAPOR BARRIEF DENSITY:
- A. ATTIC SPACE (VENTILATED OR UNVENTILATED ABOVE A CEILING) R-8.
- B. INTERIOR SPACES SUPPLY MINIMUM R-8.
- C. INTERIOR RETURN DUCTWORK, IN RETURN AIR PLENUM SPACE D. EXTERIOR DUCTWORK TO BE INSULATED WITH URETHANE OR POLY AND A DECEMBER OF A DECEMBE OF A DECEMBER OF A DECEM FOIL FACED RIGID BOARD - MINIMUM R-8, TOP OF DUCT TO HAVE WATERSHED DESIGN, A WEATHER PROOF COVER IS TO BE APP FLEXCLAD-400 (ALUMINIUM).
- 6. ALL DUCTWORK SIZES SHOWN ARE FREE AREA DIMENSIONS. EXHAUS SHALL BE UNINSULATED.
- 7. THE INTERIOR OF SUPPLY AND RETURN DUCTWORK VISIBLE BEHIND (GRDs), SHALL BE PAINTED FLAT BLACK.
- 8. LINE DUCTWORK FIFTEEN FEET UPSTREAM AND DOWNSTREAM OF AL FOR TYPE I KITCHEN HOOD, TYPE II DISHWASHER EXHAUST OR EVAPO COOLING) AND WHERE INDICATED WITH 1" THICK, 1.5# DENSITY DUCT LINING SHALL BE APPLIED TO DUCTWORK WITH FIRE RESISTANT ADH (FOSTER 85-10 OR EQUAL) AND COPPER OR CADMIUM PLATED MECHA FASTENERS, (GRAHAM, OMARK OR EQUAL). ALL DUCT SIZES INDICAT INSIDE.
- 9. FLEXIBLE DUCTWORK WHERE INDICATED ON THE DRAWINGS SHALL B WITH PLASTIC VAPOR BARRIER AT INTERIOR AND EXTERIOR, STEEL W REINFORCED. JOINTS SHALL BE BAND-CLAMPED, MASTIC-DUCT SEAL SEALED TO MAINTAIN INTEGRITY OF VAPOR BARRIER. FLEXIBLE INST SHALL BE SUPPORTED TO ELIMINATE SAGS. FLEXIBLE GLASS FIBER I SHALL HAVE A MAXIMUM 0.23 K VALUE AT 75°F. INSTALLATION SHALL & SMACNA STANDARDS. UNLESS NOTED OTHERWISE MAXIMUM LENG AND TWO 45° BENDS.
- 10. FIRE DAMPERS SHALL BE DYNAMIC (RATED FOR SYSTEM VELOCITY) A 555 AND SHALL HAVE BLADES OUT OF AIR STREAM IN COILED POSITIC LINK SHALL BE RATED AT 165°F.
- 11. COMBINATION FIRE/SMOKE DAMPERS SHALL BE DYNAMIC (RATED TO S VELOCITY) MEET UL 555S.
- 12. TYPE I, HOOD EXHAUST DUCT SHALL BE MINIMUM 16 GAUGE CARBON CONTINUOUS EXTERNAL WELDED JOINTS. MITERED ELBOWS NOT AL R/D=1.5 FABRICATE AND INSTALL IN ACCORDANCE WITH SMACNA DU CONSTRUCTION STANDARDS, LOCAL MECHANICAL CODE AND ASTM PRE-MANUFCTURED/LISTED GREASE DUCT ASSEMBLIES MAY BE APPI REQUEST. GREASE DUCT MUST BE ENCLOSED IN A 2 HR RATED ASSE E 2336. (EXTERIOR APPLICATIONS - IF 18" CLEAR TO COMBUSTIBLES C MAINTAINED, NO ENCLOSURE REQUIRED. OTHERWISE PROTECT INSU A WEATHERPROOF, STUCCO EMBOSSED ALUMINUM ENCLOSURE). C DUCTS, AT LEAST ONE 20"X20" OPENING SHALL BE PROVIDED FOR PE ENTRY. WHERE AN OPENING OF THIS SIZE IN NOT POSSIBLE, OPENIN ENOUGH TO PERMIT THOROUGH CLEANING SHALL BE PROVIDED AT INTERVALS. SUPPORT SYSTEMS FOR HORIZONTAL GREASE DUCT SYS AND LARGER IN ANY CROSS-SECTIONAL DIMENSION SHALL BE DESIG WEIGHT OF THE DUCTWORK PLUS 800 LBS AT ANY POINT IN THE DUC VERTICAL DUCTWORK WHERE PERSONNEL ENTRY IS POSSIBLE, ACC PROVIDED AT THE TOP OF THE VERTICAL RISER TO ACCOMMODATE WHERE PERSONNEL ENTRY IS NOT POSSIBLE, ADEQUATE ACCESS F SHALL BE PROVIDED ON EACH FLOOR. OPENINGS ON VERTICAL AND GREASE DUCT SYSTEMS SHALL BE PROVIDED WITH SAFE ACCESS AN PLATFORM WHEN NOT EASILY ACCESSIBLE FROM A 10 FT STEPLADDE NONLISTED DUCTWORK, THE EDGE OF THE OPENING SHALL BE NOT 1/2" FROM ALL OUTSIDE EDGES OF THE DUCT OR WELDED SEAMS. (INS MUST COMPLY WITH THE REQUIREMENTS OF NFPA 96).

## **GENERAL NOTES**

TING "ALL /E CEILINGS, IN	12.1. KITCHEN TYPE I SHUTDOWN SEQUENCES (UNLESS OTHERWISE DIRECTED BY A FIRE PROTECTION REPORT, A MANUFACTURER'S LISTING OR THE LOCAL
ED IN 3D OR IGN TEAM AND	AHJ). 12.1.1. ACTIVATION OF THE KITCHEN HOOD SUPPRESSION SYSTEM:
IATION ORK BEING	12.1.1.1. TO CAUSE AUTOMATIC FUEL SHUT-OFF UNDER THE HOOD AND REMOVAL OF ELECTRIC POWER UNDER THE HOOD, INCLUDING HOOD LIGHTS.
JILT	12.1.1.2. MAKE-UP AIR TO THE HOODS TO BE STOPPED. (UNLESS DIRECTED
CONTRACTOR NSTRAINTS AND URATE E NEEDED TO	OTHERWISE BY THE AHJ, KITCHEN HVAC SYSTEMS CAN REMAIN OPERATIONAL.) 12.1.1.3. KEF OR PCU REMAINS ON (IF OFF, TURN ON - ASK AHJ TO CLARIFY).
NG SPACE TO	12.1.2. ACTIVATION OF THE PCU OR GREASE EXHAUST DUCT SUPPRESSION SYSTEM:
HEIR CTOR FOR	12.1.2.1. TO CAUSE AUTOMATIC FUEL SHUT-OFF UNDER THE HOOD AND REMOVAL OF ELECTRIC POWER UNDER THE HOOD, INCLUDING HOOD LIGHTS.
MECHANICAL RE THEY HAVE RVICES OF A FIRE PING WITH	12.1.2.2. MAKE-UP AIR TO THE HOODS TO BE STOPPED. (UNLESS DIRECTED OTHERWISE BY THE AHJ, KITCHEN HVAC SYSTEMS CAN REMAIN OPERATIONAL.)
NDER THE N THE	12.1.2.3. KEF OR PCU TURNS OFF. 13. TYPE II, EXHAUST DUCT SHALL BE A304 STAINLESS STEEL, WHERE CONCEALED,
DES ARE TO BE	AND SATIN FINISH 316 STAINLESS STEEL WHERE EXPOSED. COORDINATE FINISH
BING, HER TRADE THAT	WITH ARCHITECT. PROVIDE CONTINUOUS EXTERNAL WELDED JOINTS. FABRICATE IN ACCORDANCE WITH ASTM A240, A276, A480 AND SMACNA DUCT CONSTRUCTION STANDARDS. MITERED ELBOWS NOT ALLOWED - R/D=1.5
D TO BECOME	14. DUCTWORK TO BE CONSTRUCTED TO SMACNA AND ASHRAE DUCT CONSTRUCTION STANDARDS.
LL COMPARE (ISTING	DUCTWORK SYSTEMS: (4) SMACNA CLASS LEAKAGE CLASS (5)
WORK OR NTS OR THEIR	PRESSURE (3) SEAL ROUND RECT. CONSTANT VOLUME 2 B 4 8
Y NOTIFY AND EXTRAS OR	VARIABLE VOLUME (1) 1 B 4 8
E PRE-BID SITE	VARIABLE VOLUME (2) 3 B 4 8
QUAL" IS	RETURN         2         C         8         16           EXHAUST         2         B         4         8
E (5) BUSINESS DERATION OF	TYPE 1 (GREASE)3WELDED23
UALITY RESTS	TYPE II2WELDED23SUPPLY/RETURN - LEED OR3A24
	GREEN GLOBES
EIN AND IN	PRESSURE CLASS OPTIONS: 1/2", 1", 2", 3", 4", 6" 10"
NSTRUCTIONS. S "OWNER'S	NOTE (1): DOWNSTREAM OF VAV BOX NOTE (2): UPSTREAM OF VAV BOX
STARTING TEST	NOTE (3): THESE ARE MINIMUMS, REFER TO EQUIPMENT SCHEDULES & SUBMITTAL DOCUMENTS, IF ESP MEETS OR EXCEEDS THESE FIGURES, INCREASE PRESSURE CLASS TO NEAREST CLASS THAT IS 0.5" W.C. OVER THE LISTED ESP. WHERE INFORMATION IS NOT PROVIDED THE
E ASTM	CONTRACTOR MUST SUBMIT A RFI. NOTE (4): WHEN USED AS PART OF A SMOKE CONTROL OR REMOVAL SYSTEM
AVING A ZINC SURFACE,	SHALL, AT A MINIMUM, BE SMACNA PRESSURE CLASS 3, SEAL CLASS A
G TO ASHRAE DS. NO	NOTE (5): LEAKAGE CLASS IS CFM LEAKAGE/100 SQ.FT. @ 1" H <sub>2</sub> 0 DUCTWORK ELBOWS: MINIMUM
<, >8"Ø ΤΟ ΒΕ	ROUND: FPM DIA/RADIUS RATIO TO 1000 0.75
	1,001 TO 1,500 1 1,500+ 1.5(2)
DUCT TAKE-OFF Y BE INDICATED	ASPECT RATIO, W/D
. SEAL ALL	RECTANGULAR: R/D 0.25 0.5 1 2 3 4
SHALL NOT BE	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
D WITH	1 (1) (1) (1) (1) (1) (1)
MUM 'K' VALUE ER, 3/4 #/CUFT.	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
G) - MINIMUM	NOTE (1):MUST HAVE AIRFOIL TURNING VALVES NOTE (2):STANDARD/DEFAULT CENTERLINE RADIUS NOTE (3):MITRED ELBOW
E - NONE. POLYSTYRENE	NOTE (4):TURNING VANES NOT REQUIRED
/E A PLIED USING MFM	NOTE (5):THIS R/D MUST BE USED FOR TYPE I GREASE DUCTS, TURNING VANES NOT ALLOWED
	MECHANICAL PRODUCTS
JST DUCTWORK DEVICES	<ol> <li>DIFFUSERS, REGISTERS AND GRILLES: MAXIMUM SOUND PRESSURE LEVELS SHALL NOT EXCEED NC 30. COORDINATE FINISH AND MOUNTING TYPE WITH ARCHITECT. ACCEPTABLE MANUFACTURERS: TITUS, NAILOR, KRUEGER, TUTTLE AND BAILEY, PRICE</li> </ol>
ALL FANS (EXCEPT	2. CONTROL DAMPERS: LEAKAGE CLASS 1A/1. EQUAL TO RUSKIN CD-60 (CD-50 IN
PORATIVE T LINER.	WET LOCATIONS) 3. PIPE HANGERS: PIPE SIZES 1/2" TO 1 1/2": MALLEABLE IRON, CARBON STEEL,
HESIVES, HANICAL	ADJUSTABLE SWIVEL, SPLIT RING. PIPE SIZES OVER 2" (UNLESS NOTED OTHERWISE): CARBON STEEL, ADJUSTABLE, CLEVIS. PIPE SIZES CHILLED WATER 8"
TED ARE CLEAR	AND OVER, HEATING WATER 6" AND OVER, STEAM (SUPPLY & CONDENSATE) 4" AND
BE INSULATED,	OVER: ADJUSTABLE STEEL YOKE, CAST IRON ROLL, DOUBLE HANGER. 4. PIPING: HYDRONIC WATER PIPING (ABOVE GROUND) - SCHEDULE 40 STEEL (ASTM
WIRE COIL	A53), MALLEABLE IRON OR FORGED STEEL WELDED TYPE FITTINGS, SCREWED OR WELDED JOINTS; OR TYPE L HARD DRAWN COPPER TUBING (ASTM B88), CAST BRASS
TALLATION	OR SOLDER WROUGHT COPPER FITTINGS, SOLDER GRADE 95TA JOINTS. PIPING
L MEET ASHRAE	OVER 2" SHALL BE STEEL WITH WELDED JOINTS. EQUIPMENT DRAIN OVERFLOWS SHALL BE TYPE M HARD DRAWN COPPER.
IGTH IS 5'-0"	5. VALVES: PROVIDE THE NAME OF MANUFACTURER AND GUARANTEED WORKING PRESSURE CAST OR STAMPED ON VALVE BODIES AND BE BY SINGLE MANUFACTURER
AND MEET UL ION. FUSIBLE	FOR SIMILAR TYPE. ACCEPTABLE MANUFACTURERS: BRAY, MILWAUKEE, STOCKHAM, NIBCO, APOLLO.
) SYSTEM	2. THE MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL, IN ACCORDANCE WITH THE NEC AND THIS PROJECT ELECTRICAL SPECIFICATIONS, ALL CONDUIT,
N STEEL WITH	WIRE, JUNCTION BOXES, THERMOSTAT BACK BOXES AND CIRCUIT BREAKERS REQUIRED FOR A FULLY OPERATIONAL ATC SYSTEM. 120V POWER, IF NOT
LLOWED - UCT	PROVIDED, SHALL BE OBTAINED FROM LOCATIONS PROVIDED ON THE ELECTRICAL DESIGN DOCUMENTS - IF NO INFORMATION IS PROVIDED THE CONTRACTOR MUST
1 A569. PROVED UPON	ISSUE AN RFI DURING THE BID PROCESS TO CLARIFY.
SEMBLY PER ASTM	<ol> <li>WHERE AN EXISTING OR NEW BAS SYSTEM IS UTILIZED THE CONTRACTOR SHALL PROVIDE A GUI PAGE FOR EACH SYSTEM. GRAPHICS MUST MATCH OR EXCEED THE</li> </ol>
SULATION WITH ON HORIZONTAL ERSONNEL	EXISTING FOR DETAIL AND INFORMATION PROVIDED. 4. SUBMIT SHOP DRAWINGS OF TEMPERATURE CONTROL WIRING, LOCATION OF DEVICES AND INSTALLATION DATA FOR REVIEW PRIOR TO INSTALLATION.
IGS LARGE 12 FT	TEST AND BALANCE (TAB)
YSTEMS 24 IN. GNED FOR THE	1. BALANCE ALL DUCTS, DIFFUSERS, AND GRILLES TO OBTAIN THE AIR QUANTITIES AS SHOWN ON PLANS. TEST AND BALANCE WORK SHALL BE PERFORMED BY AN
CT SYSTEMS. ON	INDEPENDENT, APPROVED, AND CERTIFIED AABC OR NEBB CONTRACTOR.
CESS SHALL BE DESCENT.	<ol><li>THE CONTRACTOR IS RESPONSIBLE FOR ADJUSTING DIFFUSER THROWS. LINEAR DIFFUSERS IN A HORIZONTAL CEILING SYSTEM WILL GENERALLY THROW AIR</li></ol>
FOR CLEANING HORIZONTAL	HORIZONTAL - SEE DWGS FOR DIRECTION ARROW. IF NO DIRECTION ARROW IS ILLUSTRATED THE CONTRACTOR MUST DIRECT AN RFI TO THE ENGINEER TO OBTAIN
ND A WORK DER. ON	PROPER THROW DIRECTIONS.
LESS THAN 1 NSTALLATION	3. THE TEST AND AIR BALANCE (TAB) REPORT SHALL INCLUDE DESIGN AIR QUANTITIES AND AIR QUANTITIES AFTER ADJUSTMENTS. FURNISH OWNER'S
	REPRESENTATIVE WITH THREE (3) COPIES OF THE FINAL TAB REPORT.

3. GAUGES: TEMPERATURE: INTERIOR - WEISS VARI-ANGLE DIGITAL WITH 316 SS BELOW AT 75 DEGREES F. OUTDOOR INSULATION THICKNESS SHALL BE DOUBLE THERMOWELL, EXTERIOR WITH DCV-4 OUTDOOR WATERPROOF COVER. PRESSURE: WEISS DIGITAL DUGY3-xxx-2L (PG - RFI FOR RANGE PER APPLICATION) INDOOR THICKNESS WITH A MAXIMUM THICKNESS OF 3". INTERIOR APPLICATIONS SHALL HAVE KRAFT REINFORCED FOIL VAPOR BARRIER WITH ONE PIECE PREMOLDED GAS REGULATORS SUPPLIED SHALL BE OF THE "LOCK UP" TYPE AND SHALL HAVE A PVC JACKETS FOR FITTINGS. EXTERIOR APPLICATIONS SHALL HAVE STUCCO STRAINER INSTALLED BEFORE THE REGULATOR. IN LOCATIONS WHERE SEISMIC OR EMBOSSED ALUMINUM JACKETS. ACCEPTABLE MANUFACTURERS: OWENS CORNING BUILDING CODE REQUIREMENTS DICTATE AN EARTHQUAKE OR SIESMIC ACTUATED lames R. Childers CEDTAINTEED JOUNG MANIVILLE KNALLE VALVE, THE CONTRACTOR SHALL PROVIDE AN ASCE/ANSI 25-06 LISTED SEISMIC Architect, Inc. E SIZE (IN) ACTUATED VALVE JUST AFTER THE UTILITY COMPANY METER. 5. ALL EQUIPMENT SHALL BE RATED IN EXCESS OF THE AVAILABLE FAULT CURRENT AT 45 South 4th Street Fort Smith AR 72901 THE POINT OF CONNECTION. 479-783-2480 6. WHERE VFDs (VSDs) AND MOTORS ARE PROVIDED BY THE MECHANICAL OR www.childersarchitect.com PLUMBING CONTRACTOR: VFD DRIVES SHALL MEET THE FOLLOWING MINIMUM STANDARDS - PROVIDE WITH AN INTEGRAL FUSED DISCONNECT OR 100% RATED AIC CIRCUIT BREAKER. ALLOW FOR A/C POWER FLUCTUATIONS OF - SURGE TO 525V FROM 480V, SAG TO 375V FROM 480V, FREQUENCY DEVIATION FROM 50 TO 65Hz, ICHES) VOLTAGE SPIKES UP TO 2X NORMAL INCOMING VOLTAGE FOR 1 MILLISECOND. ACCEPT A 2% VOLTAGE IMBALANCE. VFDs TO BE DANFOSS VLT6000, ABB ACH550, ION YASKAWA Z1000. ENCLOSURES TO BE RATED FOR THE INSTALLED LOCATION. 7. ELECTRIC MOTORS - MOTORS ON VFD SERVICE, OVER 10 HP, TO HAVE A SHAFT GROUNDING DEVICE, OVER 100 HP TO HAVE A SHAFT GROUNDING DEVICE AND AN INSULATED BEARING ON THE NON-DRIVEN END OF THE MOTOR. (OPPOSITE END OF THE MOTOR RELATIVE TO WHERE THE SHAFT GROUNDING DEVICE IS LOCATED.) MOTORS TO COMPLY WITH NEMA MG-1. MOTORS TO BE RATED FOR THE INSTALLED LOCATION. BELT DRIVEN OR DIRECT DRIVEN STEEL FAN, BACK DRAFT DAMPER AND CAST IRON PART THREE - EXECUTION CONSULTANT LOGO OR STEEL DYNAMICALLY BALANCED VARIABLE OR ADJUSTABLE PITCH MOTOR 1. THE CONTRACTOR SHALL PROVIDE ALL SLEEVES, OPENINGS, CUTTING AND SHEAVES. ACCEPTABLE MANUFACTURERS: GREENHECK, COOK, TWIN CITY, ACME. PATCHING NECESSARY FOR THE INSTALLATION OF THE WORK. CUTTING AND PATCHING SHALL BE DONE BY WORKMEN SKILLED IN THE TRADES REQUIRED AND BE COMPLETE WITH HERMETICALLY SEALED COMPRESSOR WITH HIGH AND LOW PAID BY THE CONTRACTOR REQUIRING THE WORK COMPLETED. SYSTEMS PASSING PRESSURE CUT-OFFS, COILS, HEATING SECTION, AIR COOLED CONDENSER, THROUGH WATER PROOFING OR DAMP PROOFING SHALL BE WATER TIGHT. SYSTEMS CONDENSER BLOWER OR FAN, AUTOMATIC CONTROLS, CONTROL PANEL WITH PASSING THROUGH FIRE RATED CONSTRUCTION SHALL BE FIRE PROOFED WITHER STARTERS AND DISCONNECT SWITCH, RELAYS, ETC, FOR SINGLE POINT POWER MATERIAL APPROVED FOR THE FIRE AND TEMPERATURE RATING OF THE ASSEMBLY CONNECTION. UNITS SHALL BE FURNISHED WITH 2 SETS OF 1" THROWAWAY AND U.L. LISTED. (IF THE ARCHITECT HAS NOT PROVIDED A STANDARD PLEATED 30% FILTERS. UNITS SHALL BE COMPLETELY FACTORY WIRED FOR DRAWING/ASSEMBLY FOR AN APPLICATION AND ONE IS NOT AVALIABLE, THE TERMINAL CONNECTIONS OF THERMOSTAT WITH A FAN-AUTO/MANUAL SWITCH AND CONTRACTOR IS RESPONSIBLE TO OBTAIN AN "ENGINEERING JUDGEMENT" AND A SYSTEM HEAT/OFF/COOL/AUTO SWITCH. UNITS TO BE INSTALLED AS PER ASSOCIATED DRAWING FOR THE APPLICATION.) MANUFACTURER RECOMMENDATIONS, WITH MANUAL OUTSIDE AIR DAMPER, 12" 2. THE CONTRACTOR SHALL PROVIDE ALL RIGGING, HANDLING OF MATERIALS AND ROOF CURB, ITEMS AS SCHEDULED AND ALL NECESSARY ACCESSORIES REQUIRED EQUIPMENT, AND THE NECESSARY PROTECTION FOR MATERIALS AND EQUIPMENT. FOR EFFICIENT AND PROPER OPERATION. ACCEPTABLE MANUFACTURERS: TRANE, 3. THE CONTRACTOR WILL PROTECT THE WORK AND MATERIAL AGAINST DIRT, THEFT, LENNOX, DAIKIN, CARRIER. INJURY OR DAMAGE UNTIL ACCEPTED BY OWNER. ALL WORK SHALL BE TURNED OVER TO OWNER CLEAN AND IN NEW CONDITION. CASING WITH STAND. COILS SHALL BE ALUMINUM PLATE FINS ON COPPER TUBES 4. WHERE PIPES ARE INSTALLED THAT PASS THROUGH FLOORS THAT ARE NOT (LEAK TESTED 150 PSIG, PRESSURE TESTED 420 PSIG). FANS SHALL BE DIRECT SLAB-ON-GRADE AND THE FLOOR IS A FIRE RATED ASSEMBLY, PER CODE, THE DRIVE PROPELLER WITH FAN GUARD. FAN SHAFT AND BLADES SHALL BE OPENING CREATED TO ACCEPT THE PIPING ASSEMBLY THROUGH THE FLOOR MUST CORROSION PROTECTED. HEAD PRESSURE CONTROL SHALL BE BY FAN CYCLING. USE A LISTED SYSTEM TO BE TEMPERATURE AND FIRE RATED TO MATCH THE RATING CHEROKEE NATION COMPRESSOR SHALL BE HERMETIC WITH EXTERNAL SPRING ISOLATORS AND OF THE FLOOR (MIN 2 HOUR). UNLOAD IN RESPONSE TO SUCTION PRESSURE IN STEPS FOR PARTIAL LOAD Entertainment OPERATION. ACCEPTABLE MANUFACTURERS: TRANE, CARRIER, YORK, DAIKIN. 5. EQUIPMENT CONDENSATE DRAINS: FAN COIL, AHU AND OTHER SIMILAR EQUIPMENT CONDENSATE DRAINS MAY OR MAY NOT BE DOCUMENTED ON THE PROJECT DRAWINGS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE WITH FIBERGLASS INTERNAL LINER AND SERVICE PANELS. FAN SHALL BE CONDENSATE DRAINS TO AN APPROVED RECEPTOR, SIZE DRAIN TO MATCH OR CENTRIFUGAL FORWARD CURVE, STATICALLY AND DYNAMICALLY BALANCED, AND EXCEED CODE MINIMUMS. PROVIDE A CONDENSATE PUMP WHERE REQUIRED (IE: HAVE PERMANENTLY LUBRICATED OR BALL BEARING SHAFT BEARINGS. WATER OR LITTLE GIANT NXTGEN) DX COILS SHALL BE COPPER TUBES MECHANICALLY BONDED TO ALUMINUM FINS AND LEAK TESTED AT 350 PSIG. PROVIDE TWO OR THREE WAY WATER CONTROL 6. EACH CONTRACTOR SHALL PROVIDE ALL FOUNDATIONS, HANGERS, AND SUPPORTS VALVES AS REQUIRED. PROVIDE INTEGRAL ON WALL THERMOSTAT. 1" DISPOSABLE FOR ALL EQUIPMENT SUPPLIED AND/OR INSTALLED UNDER THEIR WORK. ANY FILTERS, 3 SPEED MOTOR WITH SPEED SWITCH AND 18 GAUGE STEEL DRAIN PAN EQUIPMENT WITH MOVING PARTS SHALL BE PROVIDED WITH VIBRATION ISOLATION UNDER COILS. ACCEPTABLE MANUFACTURERS: TRANE, CARRIER, YORK, DAIKIN. AND FLEXIBLE CONNECTIONS TO PIPING AND OR DUCTWORK IF APPLICABLE. MISCELLANEOUS STEEL AND ANCHORS REQUIRED FOR THE INSTALLATION OF THE CONTRACTORS EQUIPMENT IS THE RESPONSIBILITY OF THE CONTRACTOR AND THE AND FAN COIL UNIT OR HEAT PUMP. PROVIDE ALL NECESSARY AUXILIARIES AND RETENTION OF A STRUCTURAL ENGINEER OR OTHER DESIGN DISCIPLINE TO APPARATUSES TO MAKE SYSTEM COMPLETE AND OPERABLE UNDER FULLY COMPLETE THE WORK IS THE RESPONSIBILITY OF THE CONTRACTOR. EG: THE USE AUTOMATIC CONTROL. PIPING SHALL BE ACR COPPER TUBING MADE UP WITH OF CONCRETE ANCHORS WILL REQUIRE DOCUMENTATION APPROVAL FROM A WROUGHT COPPER FITTINGS USING SILVER SOLDER OF SIZES AS RECOMMENDED BY STRUCTURAL ENGINEER RETAINED BY THE CONTRACTOR. MANUFACTURER. SUCTION LINES, HOT GAS BYPASS AND OUTDOOR LIQUID LINES SHALL BE INSULATED WITH 3/4" THICK RIGID CLOSED CELL FOAM INSULATION. DO WHERE PIPES OR CONDUITS PASS THROUGH WALLS, FLOORS, OR CEILINGS IN NOT RUN PIPE INSULATION IN RETURN AIR PLENUM. FINISHED AREAS, THEY SHALL BE FURNISHED WITH ESCUTCHEON PLATES (COLOR PER ARCHITECT AND/OR INTERIOR DESIGNER). STEEL WITH 13/16", 4 LBS./CU. FT. FOIL FACED DUCT BOARD INSULATION INTERIOR 8. PIPES AND/OR CONDUITS PASSING THROUGH WALL, FLOORS AND PARTITIONS LINER WITH AN R VALUE OF 3.5SQ.FT. °F HR/BTU @ 75°F, CODE COMPLIANCE WITH: SHALL BE PROVIDED WITH SLEEVES. SLEEVES PASSING THROUGH WATER PROOFING UL 723 - FLAME/SMOKE (25/50), UL 181 AIR EROSION, MOLD GROWTH & HUMIDITY, OR DAMP PROOFING SHALL BE WATER TIGHT. SLEEVES/PIPES PASSING THROUGH ASTM 1338, G21, G22 FUNGI RESISTANCE, UNIT SHALL BE ARI 880 CERTIFIED, AIR FIRE RATED CONSTRUCTION SHALL BE FIRE PROOFED WITH MATERIAL APPROVED  $\leq Z$ VALVE SHALL HAVE A MULTIPLE POINT AVERAGING FLOW SENSING DEVICE. IF FOR THE FIRE AND TEMPERATURE RATING OF THE ASSEMBLY AND U.L. LISTED. (IF SCHEDULED, THE ELECTRIC HEATING COIL SHALL BE FACTORY INSTALLED WITH THE ARCHITECT HAS NOT PROVIDED A STANDARD DRAWING/ASSEMBLY FOR AN <u>5</u> S AIRFLOW SWITCH, THERMAL PRIMARY CUTOUT, MANUAL RESET, DISCONNECT APPLICATION AND ONE IS NOT AVAILABLE, THE CONTRACTOR IS RESPONSIBLE TO SWITCH, AND MAGNETIC CONTACTOR. PROVIDE SPACE TEMPERATURE SENSOR OBTAIN AN "ENGINEERING JUDGEMENT" AND ASSOCIATED DRAWING FOR THE  $\triangleleft$ CONTROL WIRING AND TRANSFORMER. ACCEPTABLE MANUFACTURERS: TRANE, APPLICATION.) Û TITUS, ENVIROTECH, PRICE. 9. AT THE CONCLUSION OF THE JOB, EACH PIECE OF EQUIPMENT, VALVE, SWITCH, STARTER, PANEL, PIPE LINE, CONDUIT, DUCT, ETC., SHALL BE CLEARLY IDENTIFIED (ASME B16.22), JOINTS: ANSI/ASTM B32, SOLDER: 95/5 TIN/ANTIMONY, 0.2% MAX WHETHER EXPOSED OR CONCEALED, COVERED OR UNCOVERED, IN ACCORDANCE IFAD WITH OSHA AND ANSI REGULATIONS. IDENTIFY PIPES NEAR EACH VALVE WITH 4  $\bigcirc$   $\bigcirc$ "BRANDY-PERMA' CODE PIPE TAPE" OR T. & B. WESTLINE "TEL-A-PIPE" INDICATING DIRECTION OF FLOW, SERVICE, ZONE, AND SIZE, TAPE SHALL BE APPLIED TO PIPE MALLEABLE FITTINGS INSIDE AND GALVANIZED FITTINGS AND PIPE WHERE Q CONDUIT, OR COVERING. VALVES, CONTROLS, AND DAMPERS SHALL BE IDENTIFIED EXPOSED. JOINT COMPOUND. PROVIDE ISOLATION VALVES AT ALL EQUIPMENT. BY 2-INCH LACQUERED BRASS TAGS WITH STAMPED LETTERS FASTENED WITH "S" BELOW GRADE GAS PIPING SHALL BE POLYETHYLENE (PE) GAS PIPING WITH BUTT HOOKS OR CHAINS. EQUIPMENT IS TO BE IDENTIFIED AS TO FUNCTION AND FUSION JOINTS. PIPING SHALL BE LABELED GAS. GAS VALVE SHALL BE BRONZE PURPOSE BY MEANS OF PERMANENTLY ATTACHED LAMINATED ENGRAVED PHENOLIC BODY, BRONZE TAPERED PLUG, NON-LUBRICATED, TEFLON PACKING, THREADED NAMEPLATES WITH BEVELED EDGES, AND WHITE LETTERS ON BLACK BACKGROUND. Т (NO ADHESIVE LABELS ALLOWED). **A** 10. AT THE CONCLUSION OF THE WORK, ALL EQUIPMENT AND SYSTEMS SHALL BE BE INSULATED. PROVIDE METAL SADDLES AND RIGID INSULATION AT HANGERS  $\cap$ BALANCED, ADJUSTED, AND TESTED TO PROVIDE A QUIET-OPERATING, STABLE, AND WHERE SYSTEM WEIGHT COMPRESSES INSULATION. SAFELY OPERATING SYSTEM(S). DEMONSTRATE OPERATION OF ALL SYSTEMS TO THE OWNER'S DESIGNATED REPRESENTATIVE. THE TEST AND BALANCE WORK SHALL ADJUSTABLE SWIVEL, SPLIT RING. PIPE SIZES 2" TO 4": CARBON STEEL, BE PERFORMED IN ACCORDANCE WITH NEBB OR AABC STANDARDS, BY ADJUSTABLE, CLEVIS. PIPE SIZES 6" AND OVER THAT ARE SUBJECT TO EXPANSION INDEPENDENT, APPROVED, AND CERTIFIED TEST AND BALANCE PERSONNEL. & CONTRACTION: ADJUSTABLE STEEL YOKE, CAST IRON ROLL, DOUBLE HANGER. 11. IN LOCATIONS WHERE SEISMIC DESIGN REQUIREMENTS EXIST, THE SYSTEM LOAD (PIPE FULL OF DESIGN LIQUID OR GAS) ON HANGER MUST NOT MECHANICAL/PLUMBING CONTRACTOR IS RESPONSIBLE FOR RETAINING AND PAYING EXCEED MORE THAN 85% OF HANGER CAPACITY. FOR THE DESIGN SERVICES OF A STRUCTURAL ENGINEER TO CREATE THE DESIGN AND INSTALLATION DRAWINGS FOR MECHANICAL/PLUMBING SYSTEMS SEISMIC RESTRAINT SUPPORT, PER THE PROJECT BUILDING CODE. PRIOR TO BUILD FIRE ALARM SYSTEM: SHALL BE FURNISHED BY THE FIRE ALARM CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT MECHANICAL SYSTEMS SHOP CONTRACTOR, INSTALLED BY THE MECHANICAL CONTRACTOR AND WIRED BY THE DRAWINGS BASED UPON MULTI DISCIPLINE COORDINATION. INCLUDED WITH THE FIRE ALARM CONTRACTOR SHOP DRAWING SUBMISSION SHALL BE SEISMIC RESTRAINT DRAWINGS NOTING WHERE SEISMIC SUPPORT IS REQUIRED. FOR EACH AREA NOTED NEEDING SEISMIC ROJECT PHASE THE DUCT MOUNTED SMOKE DETECTORS SHALL BE FURNISHED, INSTALLED SUPPORT FOR THE MECHANICAL SYSTEMS, THERE SHALL BE A SEISMIC DRAWING DETAILING THE REQUIRED SUPPORT. THE SEISMIC SUPPORT DRAWINGS SHALL BE AND WIRED BY THE MECHANICAL CONTRACTOR. (NORMALLY PROVIDED AT BID PACKAGE 05 SIGNED AND SEALED BY A REGISTERED STRUCTURAL ENGINEER IN THE SAME STATE 24 VAC.) AS THE PROJECT. IN ADDITION TO THE PROJECT DESIGN TEAM REVIEW, THE SEISMIC SUPPORT DRAWINGS WILL BE ISSUED TO THE LOCAL BUILDING EQUIPMENT THAT EXCEEDS 2,000 CFM AND ON AIR MOVING EQUIPMENT DEPARTMENT FOR REVIEW AS PART OF A DEFERRED SUBMITTAL FOR THE BUILDING UNDER 2,000 CFM THAT SUPPLIES A COMMON SPACE AND THE TOTAL CFM DOCUMENTS. COMMENCEMENT OF CONSTRUCTION PRIOR TO BUILDING REVISIONS DESCRIPTION CAPACITY OF THE EQUIPMENT SERVING THE SPACE EXCEEDS 2,000 CFM. DATE DEPARTMENT REVIEW IS AT THE CONTRACTOR'S RISK. 12. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL REFLECTED CEILING PLAN FOR ASSOCIATED AIR MOVING EQUIPMENT ON ALARM. EXACT LOCATION OF GRILLES, REGISTERS AND DIFFUSERS. 13. PIPE HANGERS: PIPE SIZES 1/2" TO 1 1/2" - 5'-0" MAX SPACING, 3/8" MIN. ROD SUPPLY AIR DUCTWORK. (FOR THE IMC 606 -) RETURN AIR DUCTWORK DIAMETER; PIPE SIZES 2" TO 3" - 8'-0" MAX SPACING, 1/2" MIN. ROD DIAMETER; UPSTREAM OF ANY FILTERS, EXHAUST OR OUTSIDE AIR CONNECTIONS. PIPE SIZES 4 TO 6"-10'-0" MAX SPACING, 5/8" MIN. ROD DIAMETER. 14. WATER PROOFING AND FLASHING OF PIPE PENETRATIONS THROUGH THE EXTERIOR WALL AND ROOF SHALL BE THE RESPONSIBILITY OF THE INSTALLING AUTOMATIC TEMPERATURE CONTROLS(INTEGRATED INTO THE EXISTING) JOB NUMBER: MECHANICAL/PLUMBING CONTRACTOR. THE CONTRACTOR SHALL COORDINATE BUILDING AUTOMATION SYSTEM (BAS, BMS, ATC, DDC). THIS SYSTEM SHALL 05/03/18 17-06 LOCATIONS, MEANS AND METHODS WITH GENERAL CONTRACTOR/OWNER FOR THE INCLUDE BUT NOT BE LIMITED TO: TEMPERATURE SENSORS, CONTROLLERS VARIOUS BUILDING SYSTEMS. ROOFING MEMBRANE PENETRATIONS MUST BE TRANSFORMERS, EQUIPMENT INTERFACE DEVICES AND ALL REQUIRED RELAYS. T NUMBER PERFORMED BY A CONTRACTOR THAT IS WARRANTY APPROVED FOR THE SPECIFIC WIRING AND CONDUIT - REGARDLESS OF VOLTAGE. ROOFING SYSTEM. M0.2 15. CONTRACTOR SHALL OBTAIN FROM THE ARCHITECT THE EXACT LOCATION OF EQUIPMENT AND ANY OTHER APPARATUS SPECIFIED IN THESE DRAWINGS.

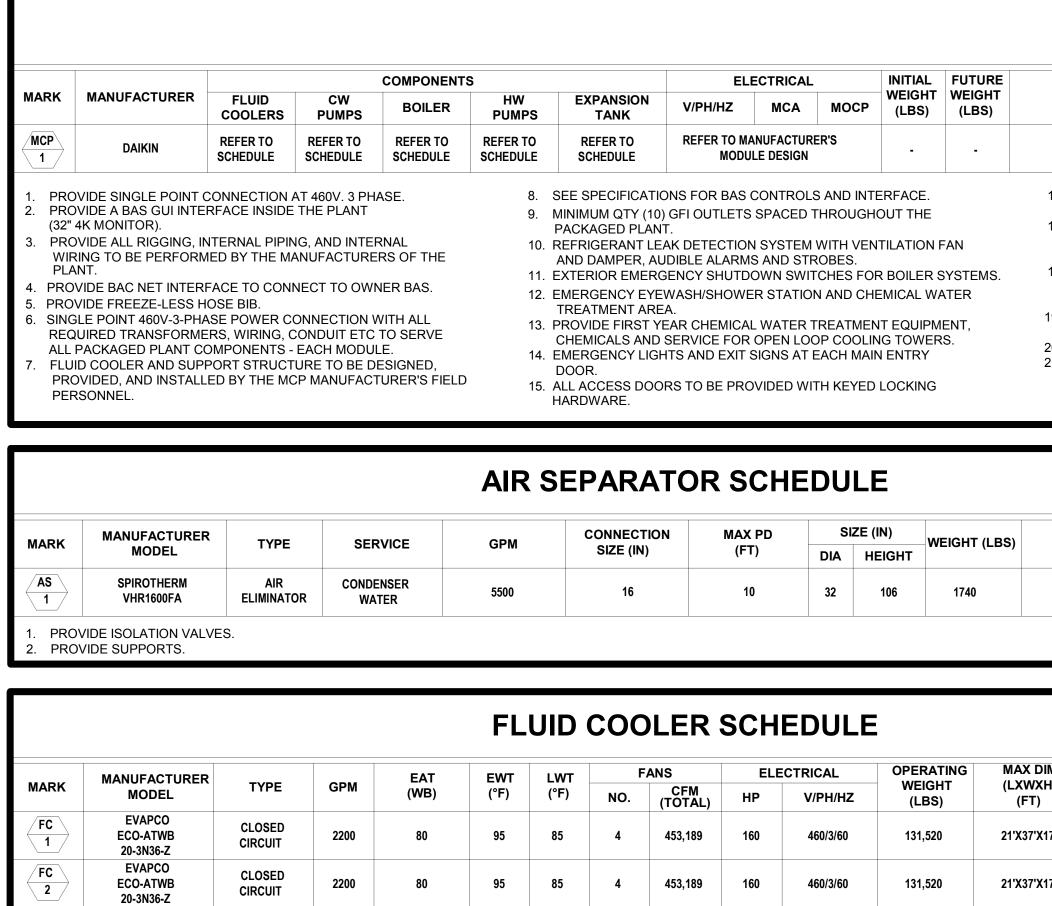
CERTAINTEED, JO	HNS MANVILLE, KNAUF.		
FLUID TEMP	INSUL. CONDUCTIVITY	NOMI	NAL PIPE
RANGE °F	BTU-IN/(HR-SQ.FT°F)	<1.5	1.5 &
> 350	0.32	5	5
251-350	0.29	4	4.5
201-250	0.27	2.5	3
141-200	0.25	1.5	2
< 140	0.22	1	1.5
OUTER INSUL.	MINIMUM ALUMINUM JA	ACKET THICKI	NESS (INC
DIAMETER	<b>RIGID INSULATION</b>	NON-RIGID	INSULATI
≤ 8"	0.016	0.016	
> 8"-11"	0.016	0.020	
> 11"-24"	0.016	0.024	
> 24"-36"	0.020	0.032	
> 36"	0.024	0.040	

6. PIPE INSULATION: GLASS FIBER INSULATION WITH A MAXIMUM K VALUE NOTED 7. FANS: PROVIDE WITH ROOF CURB WHERE APPLICABLE, DISCONNECT SWITCH, BI-8. PACKAGED ELECTRIC/GAS ROOFTOP UNITS(HEAT PUMPS INCLUDED): UNIT SHALL 11. AIR COOLED CONDENSER: PROVIDE COILS WITH INTEGRAL SUBCOOLING AND 12. SPLIT SYSTEM FAN COIL UNIT: UNITS SHALL HAVE GALVANIZED STEEL CABINET 13. REFRIGERANT PIPING: PROVIDE PIPING BETWEEN AIR-COOLED CONDENSING UNIT 14. VARIABLE AIR VOLUME TERMINAL BOXES: UNIT SHALL BE 22-GAGE GALVANIZED 15. C ONDENSATE DRAIN PIPING: TYPE "M" COPPER (ASTM B-88), WROUGHT FITTINGS 16. GAS PIPING: ABOVE GRADE SCHEDULE 40 BLACK IRON(ASME A-53), THREADED 17. PIPE INSULATION: WHERE THE CLIMATE DICTATES, CONDENSATE DRAIN PIPING TO 18. PIPE HANGERS: PIPE SIZES 1/2" TO 1 1/2": MALLEABLE IRON, CARBON STEEL, 19. DUCT MOUNTED SMOKE DETECTORS: 20. WHEN THE DUCT TYPE SMOKE DETECTOR IS REQUIRED TO BE PART OF THE DESIGN 21.1. WHEN THE DUCT TYPE DETECTOR IS NOT PART OF THE FIRE ALARM SYSTEM: 21.2. DUCT MOUNTED SMOKE DETECTORS SHALL BE INSTALLED ON AIR MOVING 21.3. DUCT MOUNTED DETECTORS SHALL BE WIRED TO SHUT DOWN THE 21.4. DETECTORS TO BE MOUNTED IN THE (EDIT FOR CORRECT CODE. UMC 608) AUTOMATIC TEMPERATURE CONTROLS 1. THE MECHANICAL CONTRACTOR SHALL PROVIDE A COMPLETE SYSTEM OF NOTES 1. DIELECTRIC FITTINGS SHALL BE USED WHEREVER DISSIMILAR METALS ARE JOINED. 2. PROVIDE ACCESS PANELS IN CEILINGS & WALLS TO ACCESS MECHANICAL/PLUMBING

- EQUIPMENT AND APPURTENANCES WHERE REQUIRED. IN HARD CEILINGS PROVIDE GFRG OR BAUCO•PLUS II ACESS PANELS.

16. INSTALL CONDENSATE PIPING, WITH P-TRAP, FULL SIZE FROM EQUIPMENT TO FLOOR SINK, MOP SINK OR TAILPIECE (3/4" MAXIMUM CONDENSATE DRAIN LINE SIZE FOR TAILPIECE).

MECHANICAL SPECIFICATIONS



10. PROVIDE PREMIUM EFFICIENT MOTOR.

PROVIDE 5 PROBE ELECTRIC WATER LEVEL CONTROL. PROVIDE LOW SOUND FAN AND WATER SILENCERS.

3. PROVIDE ACCESS LADDER WITH SAFETY CAGE, PLATFORM, AND HANDRAIL.

4. PROVIDE VIBRATION CUT-OUT SWITCH. 5. PROVIDE HIGH EFFICIENCY INVERTER DUTY MOTOR AND VFD.

## MODULAR CENTRAL PLANT SCHEDULE

### REMARKS

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37

- 16. PROVIDE EMERGENCY PANIC HARDWARE AT ALL DOORS TO ALLOW FOR EXIT WHEN DOOR IS LOCKED FROM OUTSIDE.
- 17. LABEL ALL ELECTRICAL, CONTROLS AND EQUIPMENT COMPONENTS WITH PERMANENT BLUE MECHANICALLY FASTENED PHENOLIC COATED NAMEPLATES.
- 18. PROVIDE ALL STAINLESS STEEL BOILER VENT MATERIAL REQUIRED TO COMPLETE INSTALLATION - MOUNTED BY FACTORY. 19. FACTORY TEST ALL ELECTRICAL, CONTROLS AND PIPING
- SYSTEMS PRIOR TO SHIPMENT.
- 20. PROVIDE INTERNAL LED LIGHTING FIXTURES. 21. PROVIDE FACTORY INSTALLED HEATING AND COOLING SYSTEMS TO CONDITION THE PACKAGED PLANT AND ELECTRICAL ROOMS.
- 22. PROVIDE MINIMUM 18"X18" STAINLESS STEEL FLOOR SINKS AND DRAINS WITH WALK-ON SAFETY GRATING AT ALL PUMPS, BOILERS, EMERGENCY EYEWASH LOCATIONS AND IN ANY OTHER AREA WHERE SPILLS MAY OCCUR.
- 23. ROUTE ALL AIR VENT AND PRESSURE RELIEF VALVE BLEED CONNECTIONS TO FLOOR DRAINS.
- 24. PROVIDE ALL PIPING SECTIONS WITH HIGH POINT TAPS WITH MANUAL VENTING BALL VALVES WITH HOSE END CAP. 25. PROVIDE WATER TREATMENT SYSTEMS.
- 26. PROVIDE MAKEUP WATER METERS FOR CS AND FLUID COOLER SYSTEMS.
- 27. PROVIDE CORROSION COUPON RACKS FOR EACH SYSTEM. 28. PROVIDE CHEMICAL FILTER FEEDER - POT FEEDERS ON EACH CLOSED LOOP.
- 29. PROVIDE MAKEUP WATER BACKFLOW PREVENTERS, PRV'S STRAINERS AND BYPASS QUICK FILL LINES FOR EACH SYSTEM.
- 30. ALL COMPONENT WIRING MUST BE ROUTED IN CONDUIT AND RACE WAYS.
- 31. PROVIDE MINIMUM 4" WALLS, FLOOR AND CEILING CONSTRUCTION. 32. PROVIDE 12 GA GALVANIZED TREADPLATE INTERNAL FLOORS.
- 33. ALL THE MODULE RIGGING, ASSEMBLY AND FLASHING OF WILL BE DONE BY THE FACTORY ON SITE.
- 34. PROVIDE 2-YEAR PARTS AND LABOR WARRANTY FROM STARTUP FOR ENTIRE CENTRAL PLANT.
- FOR ENTIRE CENTRAL PLANT.

MAX PD	SI	ZE (IN)	WEIGHT (LBS	2)	REMARKS
(FT)	DIA	HEIGHT		<b>&gt;</b> )	
10	32	106	1740		1 ,2
		1	1		
CUI	EDUL	F			
ЗСПІ		- 6			
			RATING		
	CTRICAL V/PH/HZ	OPEI		MAX DIM LXWXH) (FT)	REMARKS
ELE	CTRICAL	OPEI WE (L	BS)	LXWXH)	<b>REMARKS</b> 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

ARK	MANUFACTURER	SYSTEM	INPUT	OUTPUT	GPM	EWT	LWT	EFF	WATER	GAS CONNECTION	TURN	AIR INLET	AIR OUTLET		ELECTRIC	AL	OPERATING WEIGHT	REMARKS	
	MODEL	STOTEM	(MBH)	(MBH)		(°F)	(°F)	(%)	SIZE	SIZE	DOWN	SIZE	SIZE	FLA	MOCP	V/PH/Hz	(LBS)		
B 1	CAMUS DR(H)2000	HEATING	2000	1896	133	100	140	95	3"	1-1/4"	5/1	12"	8"	-	-	480/3/60	1200	1, 2, 3, 4, 5	
B 2	CAMUS DR(H)2000	HEATING	2000	1896	133	100	140	95	3"	1-1/4"	5/1	12"	8"	-	-	480/3/60	1200	1, 2, 3, 4, 5	
3	CAMUS			4000	133	140	140	95	0.11		5/1	12"	8"	_		400/0/00	4000	1, 2, 3, 4,	
MO	DR(H)2000 JNT BOILERS ON A 4"		2000 ING PAD TO A	1896 CCOMMODATE		3. PROVIDE CO	MMUNICAT			1-1/4"	5/1			-	-	480/3/60	1200	5	
MOI CO	DR(H)2000	HOUSEKEEPI IZATION KIT.	ING PAD TO A	CCOMMODATE	THE -	3. PROVIDE CO 4. NEUTRALIZA 5. ROUTE DRA <b>EXP</b>	OMMUNICAT TION KIT FC INS TO CON	TION INTER OR CONDE NDENSATE	RFACE TO EMS.	N KIT.	_E					480/3/60	1200	5	
CO	DR(H)2000 JNT BOILERS ON A 4" NDENSATE NEUTRAL	HOUSEKEEPI IZATION KIT. OW WATER C	ING PAD TO A	CCOMMODATE	THE	<ol> <li>PROVIDE CO</li> <li>NEUTRALIZA</li> <li>ROUTE DRA</li> </ol>	OMMUNICAT TION KIT FC INS TO CON	TION INTER OR CONDE NDENSATE	RFACE TO EMS. ENSATE. E NEUTRALIZATION	N KIT. CHEDUI	_E	YSTEM PRI TANK MIN	ESSURE @	OPERATIN WEIGHT (LBS)			1200 EMARKS	5	

MARK	MANUFACTURER	TYPE	SEDVICE			SYSTEM PRESSURE @	OPERATING WEIGHT	REMARKS					
WARK	MODEL	ITE	JERVICE	(GAL)	(GAL)	DIA	HT/LEN	PRESSURE (PSI)	MIN.	MAX.	TANK MIN (PSI)	(LBS)	REMARKS
ET 1		BLADDER	CONDENSER WATER	-	-	-	-	150	80	100	65	-	1, 2
THE F	SYSTEM PRESSURE TO IELD BY THE AIR/WATE RACTOR. ADJUST TO F	R BALANCE	NED IN I AT THE TOP OF THE	2. INSULAT	I UNDER STATIC CO E TANK TO MIN. R-1								

## HYDRONIC PUMP SCHEDULE

		GENER	AL DATA			HEAD	EFF	NPSHR	IMPELLER		N	IOTOR		OPERATING	
RK	MANUFACTURER MODEL	LOCATION	TYPE	SERVICE	GPM	(FT)	(%)	(FT)	SIZE (IN)	BHP	HP	RPM	V/PH/HZ	WEIGHT (LBS)	REMARKS
	ARMSTRONG SERIES 4300	МСР	VERTICAL INLINE	CONDENSER WATER	2200	100	78	17.6	11.7	-	100	-	460/3/60	2300	1, 2, 3, 4, 5, 6
/P 2	ARMSTRONG SERIES 4300	МСР	VERTICAL INLINE	CONDENSER WATER	2200	100	78	17.6	11.7	-	100	-	460/3/60	2300	1, 2, 3, 4, 5, 6
P 1	ARMSTRONG SERIES 4380	МСР	INLINE	BOILER	133	25	74	8.0	5.9	-	2	-	460/3/60	200	1, 2, 3, 4, 5, 6
P 2	ARMSTRONG SERIES 4380	МСР	INLINE	BOILER	133	25	74	8.0	5.9	-	2	-	460/3/60	200	1, 2, 3, 4, 5, 6
P 3	ARMSTRONG SERIES 4380	МСР	INLINE	BOILER	133	25	74	8.0	5.9	-	2	-	460/3/60	200	1, 2, 3, 4, 5, 6
VP 1	ARMSTRONG SERIES 4300	МСР	VERTICAL INLINE	HOT WATER	200	80	67	11.8	5.3	-	10	-	460/3/60	300	1, 2, 3, 4, 5, 6
P	ARMSTRONG SERIES 4300	МСР	VERTICAL INLINE	HOT WATER	200	80	67	11.8	5.3	-	10	-	460/3/60	300	1, 2, 3, 4, 5, 6

MODULES, AND ALL INTERNAL PIPING, WIRING, AND INSULATING

35. PROVIDE 2-YEAR MAINTENANCE AGREEMENT BY THE FACTORY

OALAHON MAY	A 32018
CONSULTANT LOGO:	Procents, Al 8000, 2000 100 T. (602) 943-8424 msa-phx.com
CLIENT: CHEROKEI Entertaint Cherokei Cherope Cherope CASINO	
CHEROKEE NATION ENTERTAINMENT TAHLEQUAH CASINO	TAHLEQUAH, OKLAHOMA
PROJECT PHASE: BID PACKAG	GE 05
REVISIONS  # DATE DESC	CRIPTION
DATE: JOB N 05/03/18 SHEET NUMBER:	IUMBER: 17-06
M0.3	

James R. Childers Architect, Inc.

45 South 4th Street

Fort Smith, AR 72901

479-783-2480

www.childersarchitect.com

								AIR	R HA	NDL	ING	I UN	IT SCHE	DULE	(WA	TEF	r so	URC	E H		MP)										
	GENERA	DATA			AIRFLOW CO	NDITIONS	3				SUF	PPLY FAN	l					RETURN	FAN						MIXED	AIR DATA					
MARK	MANUFACTURER	LOCATION	SERVICE	SUPPLY AIR	MIN. OUTSIDE AIR	OA	RETURN		M	DTOR	_	ESP	TSP (W/ DIRTY	OUTLET VELOCITY		MC	TOR	_	ESP	TSP (W/ DIRTY	ENERGY RECOVERY	ENTERING	R		2	OUTSIDE	AIR FROM	WHEEL	М		T
	MODEL	LOCATION	JEINVICE	(CFM)	(CFM)	(%)	AIR (CFM)	QTY	TYPE	RPM	HP	(IN)	FILTERS) (IN)	(FPM)	QTY	ТҮРЕ	RPM	HP	(IN)	FILTERS) (IN)	WHEEL	AIR TEMP	CFM	DB (°F)	WB (°F)	CFM	DB (°F)	WB (°F)	CFM	DB (°F)	WB (°F)
AHU 1	ANNEXAIR AHU-E-12-D-HR-WZ46	ROOF	BANQUET KITCHEN	13,000	2,000	15%	13,000	2	PLUG	1800	7.5	2.0	3.98	500	2	PLUG	1800	5	1.0	1.66		SUMMER WINTER	11,000	75 70	63 53	2,000	101 0	78 0	13,000	79.0 59.3	65.8 -
AHU 2	ANNEXAIR AHU-E-25-D-HR-WZ96	ROOF	BALLROOM	24,000	8,000	33%	24,000	4	PLUG	1800	7.5	2.0	3.98	500	4	PLUG	1800	5	1.0	1.66		SUMMER WINTER	- 16,000	75 70	63 53	8,000	101 0	78 0	24,000	83.7 46.7	68.7 -
AHU 3	ANNEXAIR AHU-E-25-D-HR-WZ96	ROOF	BALLROOM	24,000	8,000	33%	24,000	4	PLUG	1800	7.5	2.0	3.98	500	4	PLUG	1800	5	1.0	1.66	-	SUMMER WINTER	- 16,000	75 70	63 53	8,000	101 0	78 0	24,000	83.7 46.7	68.7 -
AHU 4	ANNEXAIR AHU-E-16-D-HR-WZ60	ROOF	DINING/ KITCHEN (VAV)	15,000	5,000	33%	15,000	4	PLUG	1800	7.5	2.0	3.98	500	4	PLUG	1200	5	1.0	1.66	-	SUMMER WINTER	- 10,000	75 70	63 53	5,000	101 0	78 0	15,000	83.7 46.7	68.7 -
AHU 5	ANNEXAIR AHU-E-16-D-HR-WZ60	ROOF	BALLROOM PREFUNCTION (VAV)	16,000	4,000	25%	16,000	2	PLUG	1800	7.5	2.0	3.98	500	2	PLUG	1800	5	1.0	1.66	-	SUMMER WINTER	- 12,000	75 70	63 53	4,000	101 0	78 0	16,000	81.5 52.5	67.3 -
AHU 6	ANNEXAIR ERP-E-25-EW-D-HR-2XWZ52	ROOF	CASINO	25,000	25,000	100%	25,000	1	PLUG	1800	7.5	2.0	4.81	500	1	PLUG	1800	5	1.0	2.49	ERW 1-6		-	-	-	-	-	-	-	-	-
AHU 7	ANNEXAIR ERP-E-25-EW-D-HR-2XWZ52	ROOF	CASINO	25,000	25,000	100%	25,000	1	PLUG	1800	7.5	2.0	4.81	500	1	PLUG	1800	5	1.0	2.49	ERW 1-7		-	-	-	-	-	-	-	-	-
AHU 8	ANNEXAIR AHU-E-16-D-HR-WZ60	ROOF	LOUNGE	16,000	4,000	25%	16,000	2	PLUG	1800	7.5	2.0	3.98	500	2	PLUG	1800	5	1.0	1.66	-	SUMMER WINTER	12,000	75 70	63 53	4,000	101 0	78 0	16,000	81.5 52.5	67.3 -
AHU 9	ANNEXAIR AHU-E-05-D-HR-WZ24	ROOF	BOH (VAV)	6,000	1,500	25%	6,000	2	PLUG	1200	10	2.0	3.98	500	2	PLUG	1200	7.5	1.0	1.66	-	SUMMER WINTER	- 4,500	75 70	63 53	1,500	101 0	78 0	6,000	81.5 52.5	67.3 -
AHU 10	ANNEXAIR AHU-E-09-D-HR-WZ46	ROOF	BOH (VAV)	8,000	2,000	25%	8,000	2	PLUG	1800	7.5	2.0	3.98	500	2	PLUG	1800	5	1.0	1.66		SUMMER WINTER	- 6,000	75 70	63 53	2,000	101 0	78 0	8,000	81.5 52.5	67.3
MAU 1	ANNEXAIR MAU-E-16-D-HR-WZ96	ROOF	DINING KITCHEN	15,500	15,500	100%	0	2	PLUG	1200	10	2.0	3.98	500			NC		ANS		-		-		-	-	-	-	-	-	•
(MAU) 2	ANNEXAIR MAU-E-07-D-HR-WZ52	ROOF	BANQUET KITCHEN	8,000	8,000	100%	0	2	PLUG	1800	5	1.5	3.48	500			NC	O RETURN	ANS		-		-	-	-	-	-	-	-	-	

											A		DLIN	g un	IIT SC	CHE	DULI	E (WATE	R SOUR	CEI	HEAT PUI	MP	P) (CC	DNT.)					
		D	X COIL (WSH	IP - COOLING	G MODE)		1	1	HOT GAS	S REHE	AT COIL	DX COIL (WSHP	- HEATING	G MODE)				WATER SOURCE	HEAT PUMP DATA					UNIT ELEC	TRICAL	•	1	OPERATING	
MARK	CFM	TONS	TOTAL MBH	SENSIBLE MBH	EAT (DB)	EAT (WB)	LAT (DB)	LAT (WB)	CAPACITY (MBH)	Y EA (DB	T LAT	CAPACITY (MBH)	EAT (DB)	LAT (WB)	MODEL	QTY	TONS / UNIT	EWT / LWT (°F) COOLING MODE	EWT / LWT (°F) HEATING MODE	GPM	NO. OF COMPRESSORS (VAR. SPEED)	GFI	I LIGHTS	V/PH/HZ	FLA	МСА	МОСР	WEIGHT (LBS)	REMARKS
AHU 1	13,000	42.7	512	373	78.5	65.3	52	52	253	52	70	507	57.9	94	WZ-46	1	7 - 46	85 / 100	60 / 50	80	2	1	6	460/3/60	104	112	125	9,000	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21
AHU 2	24,000	102.7	1232	822	83.7	68.7	52	52	467	52	70	1260	44.4	93	WZ-96	1	9 - 96	85 / 100	60 / 50	200	6	1	6	460/3/60	208	213	225	14,000	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21
AHU 3	24,000	102.7	1232	822	83.7	68.7	52	52	467	52	70	1260	44.4	93	WZ-96	1	9 - 96	85 / 100	60 / 50	200	6	1	6	460/3/60	208	213	225	14,000	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21
AHU 4	15,000	64.2	770	514	83.7	68.7	52	52	292	52	70	503	44.0	75	WZ-60	1	9 - 64	85 / 100	60 / 50	125	4	1	6	460/3/60	165	171	175	10,500	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
AHU 5	16,000	61.8	741	510	81.5	67.3	52	52	312	52	70	837	39.6	88	WZ-60	1	9 - 64	85 / 100	60 / 50	125	4	1	6	460/3/60	129	135	150	10,500	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
AHU 6	25,000	107.9	1294	810	82.0	68.8	52	52	486	52	70	1221	47.8	93	WZ-52	2	9 - 52	85 / 100	60 / 50	180	4	1	6	460/3/60	186	192	200	19,300	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21
AHU 7	25,000	107.9	1294	810	82.0	68.8	52	52	486	52	70	1221	47.8	93	WZ-52	2	9 - 52	85 / 100	60 / 50	180	4	1	6	460/3/60	186	192	200	19,300	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21
AHU 8	16,000	61.8	741	510	81.5	67.3	52	52	312	52	70	837	39.6	88	WZ-60	1	9 - 64	85 / 100	60 / 50	125	4	1	6	460/3/60	129	135	150	10,500	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21
AHU 9	6,000	23.2	278	192	81.5	67.3	52	52	117	52	70	159	50.6	75	WZ-24	1	3 - 24	85 / 100	60 / 50	50	2	1	6	460/3/60	91	95	110	5,500	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
AHU 10	8,000	31.0	371	256	81.6	67.3	52	52	156	52	70	178	54.4	75	WZ-30	1	5 - 32	85 / 100	60 / 50	60	2	1	6	460/3/60	83	89	110	10,500	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
MAU 1	15,500	65.4	784	603	101	78	65	65	84	65	70	1256	0	75	WZ-96	1	9 - 96	85 / 100	60 / 50	200	6	1	6	460/3/60	171	177	200	12,000	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21
MAU 2	8,000	33.8	405	312	101	78	65	65	44	65	70	648	0	75	WZ-52	1	9 - 52	85 / 100	60 / 50	100	4	1	6	460/3/60	99	105	125	7,500	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21

PROVIDE 2" DEEP, MERV 8 (CAMFIL FARR 30/30).
 PROVIDE 18" CURB.

3. PROVIDE A VFD ON EACH SUPPLY FAN AND EXHAUST FAN TO BE INSTALLED IN A CONDITIONED SPACE WITHIN THE AHU, CONTROL KEYPAD TO BE IN EXTERNAL CONTROL ENCLOSURE MOUNTED AT FACTORY. 4. PROVIDE 2" DOUBLE WALL INSULATED CONSTRUCTION THERMALLY BROKEN, FACTORY EXTERIOR PAINT.

5. PROVIDE AIR FOIL BI DIRECT DRIVE FANS.

PROVIDE SMOKE DETECTORS IN SUPPLY AND RETURN (BY FIRE ALARM CONTRACTOR).
 PROVIDE INSULATED PIPING VESTIBULE MADE OF SAME CABINET CONSTRUCTION AS MAIN AIR HANDLER. PIPING VESTIBULE SHALL HAVE HINGED ACCESS DOORS FOR

EACH COIL SECTION - MINIMUM DEPTH 30". 8. PROVIDE 2 YEAR WARRANTY.

PROVIDE LIGHTS AND CONVENIENCE OUTLETS, WIRED SEPARATE FROM MAIN UNIT POWER, ELECTRICAL CONTRACTOR TO PROVIDE 120V POWER CONNECTION.
 PROVIDE INSULATED STAINLESS STEEL DRAIN PAN.

## AID HANDLING LINIT COUEDILE (MATED COUDCE HEAT DUMD) (CONT.)

ELECT CONNECTIONS - SINGLE POINT: 480/3, SINGLE POINT: 120/1.
 ALL FREEZE STATS SHALL BE LOCATED ON THE INSIDE OF ALL AIR HANDLERS UNITS. MIN 20' ELEMENT, MANUAL RESET-CONTROLLER LOCATED INSIDE UNIT. PROVIDED AND INSTALLED BY BAS CONTRACTOR.
 EXTERNALLY MOUNTED DISCONNECT (BY CONTRACTOR).
 EXTERNALLY MOUNTED DISCONNECT (BY CONTRACTOR).
 PROVIDE OUTSIDE AIR AIR-FLOW MEASURING STATION WITH CONTROL INTERFACE. BAS CONTRACTOR TO PROVIDE AND FIELD INSTALL.
 PROVIDE SUPPLY AND EXHAUST FAN INLET AIR-FLOW MEASURING STATIONS. BAS CONTRACTOR TO PROVIDE AND FIELD INSTALL.
 PROVIDE A 16" ACCESS SECTION BETWEEN THE FIRST HEATING COIL AND THE COOLING COIL.
 PROVIDE ENTIRE CONTROLS SYSTEM UNDER ONE WARRANTY.
 HEATING COIL TO BE LOCATED DOWNSTREAM OF THE COOLING COIL (IN REHEAT POSITION).
 COLLS SHALL BE ACCESSIBLE AND REMOVABLE FROM THE TOP OF THE UNIT.
 PROVIDE WITH FNTHAI PY WHEFL. REFER TO FNERGY RECOVERY WHEFL SCHEDULE.

PROVIDE WITH ENTHALPY WHEEL. REFER TO ENERGY RECOVERY WHEEL SCHEDULE.
 PROVIDE WITH HOT GAS REHEAT.

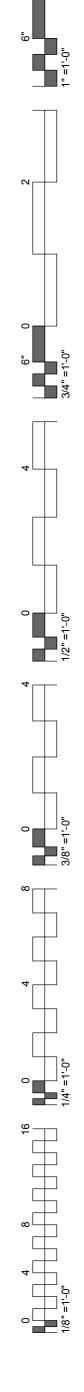
					OUTSIDE AIR	1		SUPPLY AIR			EXHAUST AIR	2		<b>RETURN AIR</b>			
ARK	SIZE	HP	SERVICE	CFM	EAT °F SUMMER DB/WB	EAT °F WINTER DB	CFM	LAT °F SUMMER DB/WB	LAT °F WINTER DB	CFM	LAT °F SUMMER DB/WB	LAT °F WINTER DB	CFM	EAT °F SUMMER DB/WB	EAT °F WINTER DB	FROST CONTROL	REMARKS
₹₩ -6	25	1.0	AHU 6	26,316	101/78	0/0	25,000	82.1/68.8	47.8/39.6	26,316	93.9/73.3	22.2/22.2	25,000	75/73	70/53	VFD	1, 2, 3, 4, 5
RW 1-7	25	1.0	AHU 7	26,316	101/78	0/0	25,000	82.1/68.8	47.8/39.6	26,316	93.9/73.3	22.2/22.2	25,000	75/73	70/53	VFD	1, 2, 3, 4, 5

CUIENT:	Licet 2901 Dect.com T. (602) 643-8424 msa-phy.com D3 2018
CHEROKEE NATION ENTERTAINMENT TAHLEQUAH CASINO	
	IUMBER: 17-06

MANUFACTU			SUPPLY	OUTDOOR	ESP					COOL	ING COIL								HE		DIL			EL	ECTRICA	L	OPERATING	
K MODEL			AIR CFM	AIR CFM	(IN WG)	HP	TOTAL MBH	SENSIBLE MBH	EAT (DB)	EAT (WB)	LAT (DB)	LAT (WB)	EWT (°F)	GPM	MAX WATER PD (FT)	EER	TOTAL MBH	EAT (DB)	LAT (DB)	EWT (°F)	GPM	MAX WATER PD (FT)	СОР	V/PH/HZ	МСА	МОСР	WEIGHT (LBS)	REMARKS
CLIMATE MAS		STIBULE	1600	0	0.5		64.0	44.0	80	67	54.3	48.7	85	12.8	10	16.3	69	70	107.7	85	12.8	10	4.5	480/3/60	15.0	20.0	500	1, 2, 3, 4, 5, 6
CLIMATE MAS		AYERS CLUB	1250	200	0.5	-	48.0	31.0	80	67	57.2	51.9	85	10.5	10	16.5	50	70	104.9	85	10.5	10	4.2	480/3/60	14.0	20.0	500	1, 2, 3, 4, 5, 6
CLIMATE MAS		STIBULE	1600	0	0.5	-	64.0	44.0	80	67	54.3	48.7	85	12.8	10	16.3	69	70	107.7	85	12.8	10	4.5	480/3/60	15.0	20.0	500	1, 2, 3, 4, 5, 6
CLIMATE MAS		TROOMS	2000	300	0.5	-	65.0	50.0	80	67	56.9	51.5	85	12.8	10	15.7	70	70	100.6	85	12.8	10	4.9	480/3/60	15.0	20.2	500	1, 2, 3, 4, 5, 6
CLIMATE MAS			1800	0	0.5	-	71.0	48.0	80	67	55.4	49.9	85	14.2	10	14.9	75	70	106.6	85	14.2	10	4.2	480/3/60	16.6	25.0	500	1, 2, 3, 4, 5, 6
CLIMATE MAS			800	0	0.5	-	37.0	22.0	80	67	55.5	50.0	85	7.9	10	17.7	39	70	112.0	85	7.9	10	4.5	480/3/60	10.3	15.0	400	1, 2, 3, 4, 5, 6
CLIMATE MAS		CTRICAL	1600	0	0.5	-	64.0	44.0	80	67	54.3	48.7	85	12.8	10	16.3	69	70	107.7	85	12.8	10	4.5	480/3/60	15.0	20.0	500	1, 2, 3, 4, 5, 6
CLIMATE MAS		ELEC 97C	800	0	0.5	-	37.0	22.0	80	67	55.5	50.0	85	7.9	10	17.7	39	70	112.0	85	7.9	10	4.5	480/3/60	10.3	15.0	400	1, 2, 3, 4, 5, 6
CLIMATE MAS		ELEC 97A	800	0	0.5	-	37.0	22.0	80	67	55.5	50.0	85	7.9	10	17.7	39	70	112.0	85	7.9	10	4.5	480/3/60	10.3	15.0	400	1, 2, 3, 4, 5, 6
CLIMATE MAS	STER	IDF 70	800	0	0.5		37.0	22.0	80	67	55.5	50.0	85	7.9	10	17.7	39	70	112.0	85	7.9	10	4.5	480/3/60	10.3	15.0	400	1, 2, 3, 4, 5, 6

	GENERAL	DATA			FANS	_		_			ECONOCO					DX C	COOLING				I	ELECTRIC	REHEAT			HUMIDI	FICATION	ELEC	CTRICAL		(	OPERATING	
MARK	MANUFACTURER	LOCATION	CFM	ESP	QUANTITY		MOTOR	TOTAL	SENS MBH	EAT EAT	T   LAT	LAT EWT	LWT GPM M					EAT	LAT	LAT		ĸw		LAT	STEPS		WATER CONN	V/PH/HZ		МСА		WEIGHT	REMARKS
	MODEL	LOCATION		(IN)	QUANTIT	RPM	BHP HP	МВН	SENS WBIT	(DB) (WB	B) (DB)	(WB) (°F)	(°F) Crim RO	WS PD (FT HD)			'' (DB)	(WB)	(DB) (	(WB)	TOTAL MBH	r v v	(DB)	(DB)	SILFS	(LB/HR)	(IN)	V/F11/112			NOCF	(LBS)	
	LIEBERT DS053DDA1EIA	MDF	8000	0.8	2	-	3.4 -	170.4	157.1		-		- 36.4		197.4	177.6	75	61	-	-	-	-	-	-	-	22	-	460/3/60	57.1	69.4	75	2200	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
	LIEBERT MMD96KNAHEH3	CASINO IDF	3750	0.5	1		- 2	82.2	76.8		-		- 17.6		92.7	84.9	75	61	-	-	-	-		-		8	-	460/3/60	21.0	26.3	30	800	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
$\xrightarrow{CRAC}{3}$	LIEBERT MMD60KNAHEH3	BALLROOM IDF	2500	0.5	1	-	- 1 1/2	55.6	51.5		-		- 12.0		62.7	55.8	75	61	-	-	-	-	-	-	-	8	-	460/3/60	19.8	24.8	25	650	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
2. PRO 3. PRO	/IDE REFRIGERANT LIN /IDE CLEARANCE ARO /IDE P-TRAPS AND ARI /IDE SAFETY CONTROL	UND UNIT PER MAI RANGE SLOPE OF	NUFACTURER'S	S RECOMM	ENDATIONS.		F	RIOR TO PROD			. VERIFY V	VHICH TO PRO	OVIDE WITH CONT	ROLS CONTRAC	TOR	MANU 8. PROVI		ER'S OVI 11UM EFF	'ERALL LE FICIENT M	ENGTH MOTOR	CTION LINES AS REQUIREMENT		D TO MEE	T	11.		IIDIFIER. TOR TO PROVID INTERFACE, BA						

	MARK	MANUFACTURER	AIRFLOW	SERVICE	MAX NC	NECK SIZE	PANEL	REMARKS		MANUFACTURER	INDOOR		NOMINAL	CON		ANS	OA AMI	BIENT ^F	ELE	CTRICAL		OPERATI		
		MODEL	RANGE	TYPE			SIZE		MARK	MODEL	UNIT	LOCATION	CAPACITY (TONS)	NO.	HP (EA)	RPM	MIN	MAX	V/PH/HZ	MCA	МОСР	WEIGH1 (LBS)		MARKS
	D-13 CFM	TITUS MCD	1750	SUPPLY CEILING	30	18"X18"	24"X24"	1, 2, 3	CCU 1	LIEBERT MCL110E8AD		ROOF	15	2	-	-	-10	105	460/3/60	6.3	15	1200	1, 2,	3, 4, 5, 6
	R-1 CFM	TITUS 50F	0-2000	RETURN CEILING	30	22"X22"	24"X24"	1		LIEBERT PFH067A-AHN	CRAC	ROOF	5	1	-	-	-10	105	460/3/60	14.2	20	550	1, 2,	3, 4, 5, 6
	R-2 CFM	TITUS FL-25	0-560	RETURN LINEAR	30	12"Ø	4' LENGTH (2) 2 1/2" SLOTS	1, 4	CCU 2B	LIEBERT PFH037A-AHN	2	ROOF	3	1	-	-	-10	105	460/3/60	9.7	15	500	1, 2,	3, 4, 5, 6
	R-4 CFM	TITUS 350FL	350-900	RETURN SIDEWALL	30	14"X14"	16"X16"	1, 3		LIEBERT PFH067A-AHN	CRAC 3	ROOF	5	1	-	-	-10	105	460/3/60	14.2	20	550	1, 2,	3, 4, 5,
	R-5	TITUS		RETURN	20	CIIVCII	4011/4011						IFACTURER'S R		 NDATIONS	L	L	L	4. PROVIDE	SAFETY (		 S.	I	
L	CFM	50F	0-150	CEILING	30	6"X6"	12"X12"	1	2. PR	ROVIDE REFRIGERAN ROVIDE CLEARANCE	AROUND UN	IT PER MANUF	FACTURER'S RE	COMME	NDATIONS.				5. PROVIDE	E LOW AME	BIENT KIT		FOPERATION DO	۷N ٦
	CFM R-6 CFM		350-600		30	6"X6" 18"X10"	12"X12" 20"X12"	1	2. PR		AROUND UN	IT PER MANUF	FACTURER'S RE	COMME	NDATIONS.					E LOW AME	BIENT KIT		OPERATION DO	WN <sup>-</sup>
	R-6	50F TITUS		CEILING				1	2. PR	ROVIDE CLEARANCE	AROUND UN	NT PER MANUF SLOPE OF REF	FACTURER'S RE FRIGERANT PIP	COMMEI NG FOR	NDATIONS. OIL RETURI	N.		TER	5. PROVIDE 6. PROVIDE	E LOW AME E HOT GAS	BIENT KIT S BY-PASS		OPERATION DO	WN 1
	R-6 CFM EX-1	50F TITUS 350R TITUS	350-600	CEILING RETURN CEILING EXHAUST	30	18"X10"	20"X12"	1 1 1 1 1	2. PR 3. PR	ROVIDE CLEARANCE A ROVIDE P-TRAPS AND	AROUND UN D ARRANGE S	NIT PER MANUF SLOPE OF REF	FACTURER'S RE FRIGERANT PIP	COMMEING FOR	NDATIONS. OIL RETURI	N.			5. PROVIDE 6. PROVIDE	E LOW AME HOT GAS	BIENT KIT S BY-PASS	S. 3		WN T
	R-6 CFM EX-1 CFM EX-2	50F TITUS 350R TITUS 50F TITUS	350-600 0-100	CEILING RETURN CEILING EXHAUST CEILING EXHAUST	30 30	18"X10" 6"X6"	20"X12" 24"X24"	1 1 1 1 1 1 1	2. PR 3. PR	ROVIDE CLEARANCE A ROVIDE P-TRAPS AND MANUFACTURER MODEL	AROUND UN D ARRANGE S	NIT PER MANUF SLOPE OF REF HEA	FACTURER'S RE FRIGERANT PIP		NDATIONS. OIL RETURI	N. NIT I	ELEC	CTRICAL	5. PROVIDE 6. PROVIDE	LOW AME HOT GAS	BIENT KIT BY-PASS		OPERATION DO	WN T
	R-6CFMEX-1CFMEX-2CFMEX-3CFMEX-4	50F TITUS 350R TITUS 50F TITUS 50F TITUS 50F TITUS	350-600 0-100 101-200	CEILING RETURN CEILING EXHAUST CEILING EXHAUST CEILING EXHAUST CEILING	30 30 30 30	18"X10" 6"X6" 8"X8"	20"X12" 24"X24" 24"X24"	1 1 1 1 1 1 1 1	2. PR 3. PR	ROVIDE CLEARANCE A ROVIDE P-TRAPS AND MANUFACTURER MODEL	AROUND UN D ARRANGE S	NIT PER MANUF SLOPE OF REF	FACTURER'S RE FRIGERANT PIP			N. NIT I r HP	ELEC (W)	CTRICAL RPM V/F	5. PROVIDE 6. PROVIDE	E LOW AME HOT GAS	BIENT KIT BY-PASS	6. R PD	OPERATING	
	R-6           CFM           EX-1           CFM           EX-2           CFM           EX-3           CFM           EX-4           CFM           1.	50F TITUS 350R TITUS 50F TITUS 50F TITUS 50F TITUS 50F TITUS 50F	350-600 0-100 101-200 201-375 376-600 OLOR, FINISH AND	CEILING RETURN CEILING EXHAUST CEILING EXHAUST CEILING EXHAUST CEILING EXHAUST CEILING	30 30 30 30 30 10N WITH AR	18"X10" 6"X6" 8"X8" 10"X10" 12"X12" RCHITECT	20"X12" 24"X24" 24"X24" 24"X24" 24"X24"	1 1 1 1 1 1 1 1	2. PR 3. PR	ROVIDE CLEARANCE A ROVIDE P-TRAPS AND MANUFACTURER MODEL	AROUND UN D ARRANGE S -OCATION LOADING DOCK	IT PER MANUF SLOPE OF REF HEA	FACTURER'S RE FRIGERANT PIP ATING V CAPACITY MBH C 50.0 1	COMMEING FOR	ERU	N. NIT I 5) нр 4 0.1	<b>ELEC</b> (W)	CTRICAL RPM V/F	5. PROVIDE 6. PROVIDE SCHE	LOW AME HOT GAS	BIENT KIT BY-PASS G WATER LWT (°F) 100	S. PD (FT)	OPERATING WEIGHT (LBS)	
	R-6           CFM           EX-1           CFM           EX-2           CFM           EX-3           CFM           EX-4           CFM           1.           COOR           2.           WHER           3.           PROV	50FTITUS 350RTITUS 50FTITUS 50FTITUS 50FTITUS 50FTITUS 50F	350-600 0-100 101-200 201-375 376-600 OLOR, FINISH AND MPER IS SHOWN II JND TRANSITION F	CEILING RETURN CEILING EXHAUST CEILING EXHAUST CEILING EXHAUST CEILING DEXACT LOCATION IN THE DUCTWO	30 30 30 30 30 10N WITH AR DRK TAKEOFF	18"X10" 6"X6" 8"X8" 10"X10" 12"X12" RCHITECT	20"X12" 24"X24" 24"X24" 24"X24" 24"X24"		2. PR 3. PR	ROVIDE CLEARANCE A         ROVIDE P-TRAPS AND         MANUFACTURER         MODEL         REZNOR         WS         REZNOR         WS	AROUND UN DARRANGE S -OCATION LOADING DOCK	HEA	FACTURER'S RE FRIGERANT PIP ATING V CAPACITY MBH C 50.0 1 50.0 1	COMMEING FOR	NDATIONS. OIL RETURI ERU AIR EAT LAT DB) (DB	N. NIT I 5) HP 4 0.1 4 0.1	<b>ELEC</b> (W) .15	CTRICAL           RPM         V/F           1600         120	5. PROVIDE 6. PROVIDE SCHEI PH/HZ GPN 0/1/60 3.0	LOW AME HOT GAS	BIENT KIT BY-PASS G WATER LWT (°F) 100 100	8 PD (FT) 0.12	OPERATING WEIGHT (LBS) 70.0	



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	Α	IR DIST	RIBUTI	ON S	CHEDU	ILE	
MARK	MANUFACTURER MODEL	AIRFLOW RANGE	SERVICE TYPE	MAX NC	NECK SIZE	PANEL SIZE	REMARKS
D-1 CFM	TITUS MCD	0-100	SUPPLY CEILING	30	6"X6"	24"X24"	1, 2, 3
D-2 CFM	TITUS MCD	101-200	SUPPLY CEILING	30	8"X8"	24"X24"	1, 2, 3
D-3 CFM	TITUS MCD	201-350	SUPPLY CEILING	30	10"X10"	24"X24"	1, 2, 3
D-4 CFM	TITUS MCD	351-500	SUPPLY CEILING	30	12"X12"	24"X24"	1, 2, 3
D-5 CFM	TITUS FL-25	400-600	SUPPLY LINEAR	30	12"Ø	4' LENGTH (2) 2 1/2" SLOTS	1, 2, 3
D-6 CFM	TROX FBA-3-V-KF-SM/200	80-95	FLOOR SUPPLY	30	-	24"X24"	1, 2, 3
D-7 CFM	TITUS TMR	1000	CEILING SUPPLY	30	8"	22"	-
D-8 CFM	TITUS FL-25	0-300	SUPPLY LINEAR	30	12"Ø	2' LENGTH (2) 2 1/2" SLOTS	1, 2, 3
D-9 CFM	TITUS MCD	0-100	SUPPLY CEILING	30	6"X6"	12"X12"	1, 2, 3
D-10 CFM	TITUS MCD	101-200	SUPPLY CEILING	30	8"X8"	14"X14"	1, 2, 3
D-11 CFM	TITUS MCD	201-350	SUPPLY CEILING	30	10"X10"	16"X16"	1, 2, 3
D-12 CFM	TITUS MCD	800	SUPPLY CEILING	30	16"X16"	24"X24"	1, 2, 3

## **COMPUTER ROOM AIR CONDITIONING UNIT**

Y-BALL FLOWFLOW CONTROL VALVE, HAYS MESURFLO AUTOMATIC (2-80 PSID RANGE) WITH PT PORTS, HOSE KIT WITH MINIMUM 24" SS LINES, ISOLATION BALL VALVES (LEVER HANDLE), BANDED AND LABELED FOR CORRESPONDING HEAT PUMP. PIPE SIZE TO COILS: LESS THAN 3.1 GPM=3/4", LESS THAN 6.1 GPM=1", LESS THAN 11.1 GPM=1.5" 3.

4.

AS South 4th Str Argense R. Cr As South 4th St Fort Smith, AR 7 479-783-248 www.childersarchited	Inc. reet 2901
CLIENT: CLIENT: CHEROKEE Entertainn CECECO CASINO	NATION
CHEROKEE NATION ENTERTAINMENT TAHLEQUAH CASINO	TAHLEQUAH, OKLAHOMA
PROJECT PHASE: BID PACKAC	GE 05
	UMBER: 17-06
MECHANIC SCHEDUL	

## ALUL A TERMINIAL ROY COLLERULE

							AHU-4 T	ERMINAL	BOX SCH	IEDU	LE														AHU-1 T	ERMINA	L BOX SC	HED	ULE							
	MANUFAC		All	R FLOW (CF	M)	INLET	VAV AIR PRESSURE	NC RATIN	NG @ 1" SP			EHEAT CO					OPERATING			MANUFACTURER	A	IR FLOW (CF		INLET	VAV AIR PRESSURE	NC RATI	NG @ 1" SP				OIL (HEATIN				OPERATING	
MARK	MANOFAC	-	MAX.	COOLING MIN.	HEATING MIN.	DIA (IN)	DROP (IN WG)	DISCHARGE	RADIATED	MBH	GPM	EAT   L/ (°F)   (°f	AT   EWT <sup>(°</sup> F)	LWT (°F)	PD (FT)	ROWS	VEIGHT (LBS	S) REMARKS	MARK	MANOFACTORER	MAX.	COOLING MIN.	HEATING MIN.	DIA (IN)	DROP (IN WG)	DISCHARGE	RADIATED	MBH	GPM (	.AT / °F) /	LAT EWT (°F) (°F)	LWT (°F)	PD (FT)	ROWS	WEIGHT (LBS)	REMARKS
VAV 4-1	TITUS DESV		1000	600	600	10	0.3	20	22	19.2	2.6	65 9	5 140	100	0.5	2	25	1, 2, 3	VAV 1-1	TITUS DESV	2200	1400	1400	14	0.4	17	22	44.8	6.3	65	95 140	100	1.7	2	25	1, 2, 3
VAV 4-2	TITUS DESV		1000	600	600	10	0.3	20	22	19.2	2.6	65 9	5 140	100	0.5	2	25	1, 2, 3	VAV 1-2	TITUS DESV	2200	1400	1400	14	0.4	17	22	44.8	6.3	65	95 140	100	1.7	2	25	1, 2, 3
VAV 4-3	TITUS DESV		1000	600	600	10	0.3	20	22	19.2	2.6	65 9	5 140	100	0.5	2	25	1, 2, 3	VAV 1-3	TITUS DESV	2200	1400	1400	14	0.4	17	22	44.8	6.3	65	95 140	100	1.7	2	25	1, 2, 3
VAV 4-4	TITUS DESV		1000	600	600	10	0.3	20	22	19.2	2.6	65 9	5 140	100	0.5	2	25	1, 2, 3	VAV 1-4	TITUS DESV	2200	1400	1400	14	0.4	17	22	44.8	6.3	65	95 140	100	1.7	2	25	1, 2, 3
VAV 4-5	TITUS DESV		2000	1200	1200	14	0.3	17	22	38.4	4.2	65 9	5 140	100	0.8	2	25	1, 2, 3	VAV 1-5	TITUS DESV	100	50	50	04	0.1	25	27	5.8	0.5	65	95 140	100	0.2	2	25	1, 2, 3
VAV 4-6	TITUS DESV		1200	720	720	10	0.4	22	24	23.0	4.3	65 9	5 140	100	1.2	2	25	1, 2, 3	VAV 1-6	TITUS DESV	2000	1200	1200	14	0.3	17	22	38.4	4.2	65	95 140	100	0.8	2	25	1, 2, 3
VAV 4-7	TITUS DESV		800	480	480	10	0.2	18	22	15.4	1.7	65 9	5 140	100	0.3	2	25	1, 2, 3	VAV 1-7	TITUS DESV	2100	1350	1350	14	0.4	17	22	44.8	6.3	65	95 140	100	1.7	2	25	1, 2, 3
VAV 4-8	TITUS DESV		1500	900	900	12	0.4	21	23	28.8	3.8	65 9	5 140	100	1.1	2	25	1, 2, 3	2. IN	VITH HANGER BRACK	BE STERIL		CTOR.		5. DUCT TO INLET - MIN OI IF OVER 15 FOOT RUN ( SIZES LARGER.	OR MORE THAN TWO	O 90° ELBOWS-MIN. TV	WO DUCT	T 7.	PIPE SI	ABELED FOR IZES TO COI 11.1 GPM=1.2	ILS: LESS T	THAN 3.1 (	GPM=3/4",	", LESS THAN 6	6.1 GPM=1", LESS
VAV 4-9	TITUS DESV		1500	900	900	12	0.4	21	23	28.8	3.8	65 9	5 140	100	1.1	2	25	1, 2, 3	INSTA	ALLATION NOTES: 11NIMUM 3 DUCT DIAM				ON INLET.	6. UNITS WITH HEATING W FLOW CONTROL VALVE MINIMUM 24" SS LINES,	(2-80 PSID RANGE)	WITH PT PORTS, HOS	SE KIET W	- 8. VITH 9.	MINIMU	UM INLET SP UM DOWNST	P: 1"				
VAV 4-10	TITUS DESV		2200	1400	1400	14	0.4	17	22	44.8	6.3	65 9	5 140	100	1.7	2	25	1, 2, 3												_			_			
VAV 4-11	TITUS DESV		2200	1400	1400	14	0.4	17	22	44.8	6.3	65 9	5 140	100	1.7	2	25	1, 2, 3							AHU-9 T	ERMINA	L BOX SC	HED	ULE							
VAV 4-12	TITUS DESV		500	300	300	06	0.3	21	24		1.4	65 9	5 140	100	0.3	2	25	1, 2, 3	MARK	MANUFACTURER MODEL	A MAX.	IR FLOW (CF	HEATING	INLET DIA (IN)	VAV AIR PRESSURE DROP (IN WG)	NC RATI	NG @ 1" SP RADIATED	МВН			OIL (HEATIN			ROWS V	OPERATING WEIGHT (LBS)	REMARKS
1.	VITH HANGER	BRACKET	TS.				5. DUCT TO INLET - MIN O				7					G VAV BOX				тітце		MIN.	MIN.	("")				-	+		<u>(F)</u> ( <b>F</b> )					

REMARKS

1, 2, 3

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WITH HANGER BRACKETS. INSULATION LINER TO BE STERILOC.

CONTROLS AND ACTUATOR BY BAS CONTRACTOR.

5. DUCT TO INLET - MIN ONE (EVEN) DUCT SIZE LARGER THAN LISTED INLET. IF OVER 15 FOOT RUN OR MORE THAN TWO 90° ELBOWS-MIN. TWO DUCT SIZES LARGER. 6. UNITS WITH HEATING WATER COIL, HAYS MESURFLO AUTOMATIC Y-BALL

FLOW CONTROL VALVE (2-80 PSID RANGE) WITH PT PORTS, HOSE KIET WITH 9. MINIMUM DOWNSTREAM SP: 0.25". MINIMUM 24" SS LINES, ISOLATION BALL VALVES (LEVER HANDLE), BANDED

7. PIPE SIZES TO COILS: LESS THAN 3.1 GPM=3/4", LESS THAN 6.1 GPM=1", LESS THAN 11.1 GPM=1.25", LESS THAN 18.1 GPM=1.5".

INSTALLATION NOTES:

4. MINIMUM 3 DUCT DIAMETERS OF STRAIGHT RIGID DUCT ON INLET.

						AHU-5 T	ERMINAL	BOX SCI	HED	ULE								
		Δ	IR FLOW (CF	M)	INLET	VAV AIR PRESSURE	NC RATIN	G @ 1" SP			REHEA	T COIL (H	IEATING	WATER	)		OPERATING	T
MARK	MANUFACTURER MODEL	MAX.	•	HEATING MIN.	DIA (IN)	DROP (IN WG)	DISCHARGE	RADIATED	МВН	GPM	EAT (°F)	LAT (°F)	EWT (°F)		PD (FT)	ROWS		
VAV 5-1	TITUS DESV	1100	700	700	10	0.4	20	23	22.4	4.0	65	95	140	100	1.0	2	25	
VAV 5-2	TITUS DESV	2200	1350	1350	14	0.4	17	22	43.2	5.7	65	95	140	100	1.4	2	25	
VAV 5-3	TITUS DESV	650	400	400	08	0.3	19	22	12.8	1.6	65	95	140	100	0.4	2	25	
VAV 5-4	TITUS DESV	650	400	400	08	0.3	19	22	12.8	1.6	65	95	140	100	0.4	2	25	
VAV 5-5	TITUS DESV	650	400	400	08	0.3	19	22	12.8	1.6	65	95	140	100	0.4	2	25	
VAV 5-6	TITUS DESV	600	400	400	08	0.3	19	20	12.8	1.6	65	95	140	100	0.4	2	25	
VAV 5-7	TITUS DESV	3000	1800	1800	24x16	0.3	24	34	57.1	5.1	65	95	140	100	1.7	2	25	
VAV 5-8	TITUS DESV	775	500	500	08	0.4	21	23	16.0	3.1	65	95	140	100	1.3	2	25	
VAV 5-9	TITUS DESV	3000	1800	1800	24x16	0.3	24	34	57.1	5.1	65	95	140	100	1.7	2	25	
VAV 5-10	TITUS DESV	3000	1800	1800	24x16	0.3	24	34	57.1	5.1	65	95	140	100	1.7	2	25	
VAV 5-11	TITUS DESV	775	500	500	08	0.4	21	23	16.0	3.1	65	95	140	100	1.3	2	25	
VAV 5-12	TITUS DESV	500	300	300	06	0.3	21	24	9.6	1.4	65	95	140	100	0.3	2	25	
2. IN 3. C INSTA	I VITH HANGER BRACK SULATION LINER TO ONTROLS AND ACTU ALLATION NOTES: INIMUM 3 DUCT DIAM	BE STERIL ATOR BY B	AS CONTRA		ON INLET.	<ol> <li>DUCT TO INLET - MIN O IF OVER 15 FOOT RUN SIZES LARGER.</li> <li>UNITS WITH HEATING V FLOW CONTROL VALVE MINIMUM 24" SS LINES</li> </ol>	OR MORE THAN TWO VATER COIL, HAYS ME E (2-80 PSID RANGE) V	90° ELBOWS-MIN. T ESURFLO AUTOMAT VITH PT PORTS, HOS	WO DUCT IC Y-BALL SE KIET W	ITH	7. PIPI THA 8. MIN	E SIZES "	TO COILS PM=1.25 LET SP:	S: LESS <sup>*</sup> 5", LESS <sup>*</sup> 1"	THAN 3. THAN 18	G VAV B( 1 GPM=3/ 3.1 GPM=	4", LESS THAN	3. <i>*</i>

8. MINIMUM INLET SP: 1"

	MANUFACTURER	AI	R FLOW (CF		INLET	VAV AIR PRESSURE	NC RATIN	G @ 1" SP				Γ COIL (H			•		OPERATING	
MARK	MODEL	MAX.	COOLING MIN.	HEATING MIN.	DIA (IN)	DROP (IN WG)	DISCHARGE	RADIATED	МВН	GPM	EAT (°F)	LAT (°F)	EWT (°F)	LWT (°F)	PD (FT)	ROWS	WEIGHT (LBS)	REMARKS
VAV 9-1	TITUS DESV	300	200	200	06	0.1	16	18	6.6	0.8	65	95	140	100	0.2	2	25	1, 2, 3
VAV 9-2	TITUS DESV	450	300	300	06	0.3	20	23	9.6	1.4	65	95	140	100	0.3	2	25	1, 2, 3
VAV 9-3	TITUS DESV	825	500	500	08	0.4	21	24	16.0	3.1	65	95	140	100	1.3	2	25	1, 2, 3
VAV 9-4	TITUS DESV	450	300	300	06	0.3	20	23	9.6	1.4	65	95	140	100	0.3	2	25	1, 2, 3
VAV 9-5	TITUS DESV	725	450	450	08	0.3	20	23	14.4	2.2	65	95	140	100	0.7	2	25	1, 2, 3
VAV 9-6	TITUS DESV	800	500	500	08	0.4	21	24	16.0	3.1	65	95	140	100	1.3	2	25	1, 2, 3
VAV 9-7	TITUS DESV	225	150	150	04	0.1	27	29	5.8	0.8	65	95	140	100	0.2	2	25	1, 2, 3
VAV 9-8	TITUS DESV	800	500	500	08	0.4	21	24	16.0	3.1	65	95	140	100	1.3	2	25	1, 2, 3
VAV 9-9	TITUS DESV	1000	600	600	10	0.3	20	22	19.2	2.6	65	95	140	100	0.5	2	25	1, 2, 3
VAV 9-10	TITUS DESV	500	300	300	06	0.3	21	24	9.6	1.4	65	95	140	100	0.3	2	25	1, 2, 3
VAV 9-11	TITUS DESV	200	150	150	04	0.1	25	27	5.8	0.8	65	95	140	100	0.2	2	25	1, 2, 3
VAV 9-12	TITUS DESV	400	250	250	06	0.2	18	22	8.0	1.1	65	95	140	100	0.2	2	25	1, 2, 3
1. W 2. IN	L INTERNATION LINER TO	BE STERILO				5. DUCT TO INLET - MIN ON IF OVER 15 FOOT RUN ON SIZES LARGER.					7. PIPE	E SIZES 1	O COILS	S: LESS 1	ΓHAN 3. <sup>-</sup>	  G VAV B( 1 GPM=3/ 3 1 GPM=1	4", LESS THAN 6	.1 GPM=1", LESS

2 IN 3. CONTROLS AND ACTUATOR BY BAS CONTRACTOR.

INSTALLATION NOTES: 4. MINIMUM 3 DUCT DIAMETERS OF STRAIGHT RIGID DUCT ON INLET.

SIZE 6. UNI

FI ALVES (LEVER HANDLE), BANDED

## AL BOX SCHEDULE

		Δ	R FLOW (CF	:M)	INLET	VAV AIR PRESSURE		G @ 1" SP			REHEAT		IEATING	WATER				
MARK	MANUFACTURER MODEL	MAX.	•	HEATING MIN.	DIA (IN)	DROP (IN WG)	DISCHARGE	RADIATED	МВН	GPM	EAT (°F)	LAT (°F)	EWT (°F)		/ PD (FT)	ROWS	OPERATING WEIGHT (LBS)	REMARKS
VAV 10-1	TITUS DESV	725	450	450	08	0.3	20	23	14.4	2.2	65	95	140	100	0.7	2	25	1, 2 ,3
VAV 10-2	TITUS DESV	600	400	400	08	0.3	19	20	12.8	1.6	65	95	140	100	0.4	2	25	1, 2 ,3
VAV 10-3	TITUS DESV	400	250	250	06	0.2	18	22	8.0	1.1	65	95	140	100	0.2	2	25	1, 2 ,3
VAV 10-4	TITUS DESV	600	400	400	08	0.3	19	20	12.8	1.6	65	95	140	100	0.4	2	25	1, 2 ,3
VAV 10-5	TITUS DESV	900	550	550	08	0.5	22	25	17.6	4.5	65	95	140	100	2.7	2	25	1, 2 ,3
VAV 10-6	TITUS DESV	1075	650	650	10	0.3	20	23	20.8	3.2	65	95	140	100	0.7	2	25	1, 2 ,3
VAV 10-7	TITUS DESV	600	400	400	08	0.3	19	20	12.8	1.6	65	95	140	100	0.4	2	25	1, 2 ,3
VAV 10-8	TITUS DESV	2000	1200	1200	14	0.3	17	22	38.4	4.2	65	95	140	100	0.8	2	25	1, 2 ,3
VAV 10-9	TITUS DESV	2000	1200	1200	14	0.3	17	22	38.4	4.2	65	95	140	100	0.8	2	25	1, 2 ,3
2. IN	ITH HANGER BRACKI SULATION LINER TO	<b>BE STERIL</b>		0705		5. DUCT TO INLET - MIN ON IF OVER 15 FOOT RUN C SIZES LARGER.					7. PIPE	E SIZES	TO COILS	S: LESS 1	<b>FHAN 3</b> .1	G VAV B( 1 GPM=3/	4", LESS THAN 6	.1 GPM=1", LESS

D FOR CORRESPONDING VAV BOX. D COILS: LESS THAN 3.1 GPM=3/4", LESS THAN 6.1 GPM=1", LESS M=1.25", LESS THAN 18.1 GPM=1.5". T SP: 1" /NSTREAM SP: 0.25".

JCT TO INLET - MIN OI	
OVER 15 FOOT RUN (	OR MORE THAN TWC
ZES LARGER.	
NITS WITH HEATING W	ATER COIL, HAYS M
OW CONTROL VALVE	(2-80 PSID RANGE)
IINIMUM 24" SS LINES,	<b>ISOLATION BALL VA</b>
AHU-10	<b>FERMINA</b>
AHU-10	<b>FERMINA</b>
AHU-10	

VAV AIR PRESSURE	NC RATIN	G @ 1" SP			REHEAT	COIL (H	IEATING	WATER	)		OPERATING	
DROP (IN WG)	DISCHARGE	RADIATED	МВН	GPM	EAT (°F)	LAT (°F)	EWT (°F)	LWT (°F)	PD (FT)	ROWS	WEIGHT (LBS)	REMARKS
0.3	20	23	14.4	2.2	65	95	140	100	0.7	2	25	1, 2 ,3
0.3	19	20	12.8	1.6	65	95	140	100	0.4	2	25	1, 2 ,3
0.2	18	22	8.0	1.1	65	95	140	100	0.2	2	25	1, 2 ,3
0.3	19	20	12.8	1.6	65	95	140	100	0.4	2	25	1, 2 ,3
0.5	22	25	17.6	4.5	65	95	140	100	2.7	2	25	1, 2 ,3
0.3	20	23	20.8	3.2	65	95	140	100	0.7	2	25	1, 2 ,3
0.3	19	20	12.8	1.6	65	95	140	100	0.4	2	25	1, 2 ,3
0.3	17	22	38.4	4.2	65	95	140	100	0.8	2	25	1, 2 ,3
0.3	17	22	38.4	4.2	65	95	140	100	0.8	2	25	1, 2 ,3
5. DUCT TO INLET - MIN ON IF OVER 15 FOOT RUN C SIZES LARGER.					7. PIPE	SIZES 1		S: LESS 1	<b>FHAN 3</b> .1	G VAV BO GPM=3/	4", LESS THAN 6	.1 GPM=1", LESS

3. CONTROLS AND ACTUATOR BY BAS CONTRACTOR.
INSTALLATION NOTES:
MINIMUM 3 DUCT DIAMETERS OF STRAIGHT RIGID DUCT ON INLET.

SIZES LARGER.
SIZES LARGER.
MINIMUM 24" SS LINES, ISOLATION BALL VALVES (LEVER HANDLE), BANDED

7. PIPE SIZES TO COILS: LESS THAN 3
THAN 11.1 GPM=1.25", LESS THAN 1
SIZES LARGER.
MINIMUM 24" SS LINES, ISOLATION BALL VALVES (LEVER HANDLE), BANDED

## ALULA TERMINIAL ROY COLLERING

MESURFLO AUTOMATIC Y-BALL

THAN 11.1 GPM=1.25", LESS THAN 18.1 GPM=1.5". 8. MINIMUM INLET SP: 1" WITH PT PORTS, HOSE KIET WITH 9. MINIMUM DOWNSTREAM SP: 0.25".



James R. Childers Architect, Inc.

45 South 4th Street Fort Smith, AR 72901 479-783-2480

www.childersarchitect.com





M0.6

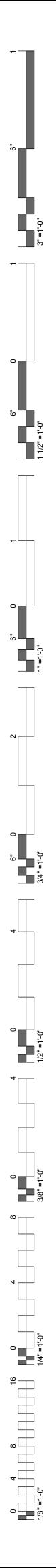
MECHANICAL SCHEDULES

THAN 11.1 GPM=1.25", LESS THAN 18.1 GPM=1.5". 8. MINIMUM INLET SP: 1"

				EX	HAUS	ST FAN	N SCH	IEDUI	_E											MAU-1 T	ERMINAL	BOX SC	HEDULE		
		GENERAL DAT	A		I	FAN			ELE	CTRICAL		OPERATING													
MARK	MANUFACTURER	LOCATION	SERVICE	ТҮРЕ	CFM	ESP	RPM	BHP	HP (W)	FLA	V/PH/HZ	WEIGHT (LBS)	REMARKS	MARK	MANUFACTURER	Α	R FLOW (CF	,	INLET DIA	VAV AIR PRESSURE DROP	NC RATIN	G @ 1" SP	REHEAT COIL (HEATING WATER)	OPERATING	REMARKS
	MODEL		RESTROOMS			(IN WG)			(VV)					MARK	MODEL	MAX.	COOLING   MIN.	HEATING MIN.	(IN)	(IN WG)	DISCHARGE	RADIATED	MBH GPM C°F) C°F) C°F) C°F) C°F)	PD ROWS WEIGHT (LBS)	REMARKS
$\left\langle \begin{array}{c} EF \\ 1 \end{array} \right\rangle$	GREENHECK GB-161-15	ROOF	MENS 11 WOMENS 13	CENTRI- FUGAL	2900	0.75	1349	1.02	1 1/2	3	480/3/60	200	1, 2, 3, 4	MCV 1-1	TITUS DESV	3360	385		16		-	-	NO HEAT		1
$\left\langle \frac{\text{EF}}{2} \right\rangle$	GREENHECK GB-101-3	ROOF	RESTROOMS MENS 73 WOMENS 74	CENTRI- FUGAL	700	0.5	1316	0.15	1/3	7.2	115/1/60	100	1, 2, 3, 4		TITUS DESV	1900	300		14				NO HEAT		1
EF 3	GREENHECK GB-101-3	ROOF	RESTROOMS TOILET 87 TOILET 88	CENTRI- FUGAL	500	0.5	1192	0.11	1/3	7.2	115/1/60	100	1, 2, 3, 4		TITUS DESV	2430	300		14		-		NO HEAT		1
EF 4	GREENHECK GB-131-5	ROOF	RESTROOMS MENS 90	CENTRI- FUGAL	1100	0.5	1218	0.23	1/2	9.8	115/1/60	100	1, 2, 3, 4	MCV 1-4	TITUS DESV	1700	190		12			-	NO HEAT	·	1
EF 5	GREENHECK GB-131-5	ROOF	RESTROOMS WOMENS 92	CENTRI- FUGAL	1200	0.5	1269	0.26	1/2	9.8	115/1/60	100	1, 2, 3, 4	MCV	TITUS DESV	2400	300		14			-	NO HEAT		1
EF 6	GREENHECK GB-101-5	ROOF	RESTROOMS WOMENS 22 MENS 24	CENTRI- FUGAL	800	0.5	1397	0.18	1/2	9.8	115/1/60	100	1, 2, 3, 4	MCV 1-6	TITUS DESV	1480	190	- -	12			-	NO HEAT		1
EF 7	GREENHECK SP-B200	CEILING	RESTROOMS TOILET 82	CEILING	150	0.5	950	-	(172)	-	115/1/60	25	2, 3, 4	MCV 1-7	TITUS DESV	2230	300		14			-	NO HEAT		1
1. PROV 2. PROV	IDE ROOF CURB. DE MOTOR WITH THE	ERMAL OVERLOA	DS.	3. 4.	PROVIDE PROVIDE	DISCONNECT BACKDRAFT [	SWITCH. DAMPER.							1. IN	ILET SIZE SHALL BE A	S SCHEDU	LED UNLES	 S NOTED O <sup>T</sup>	 THERWISE	 					

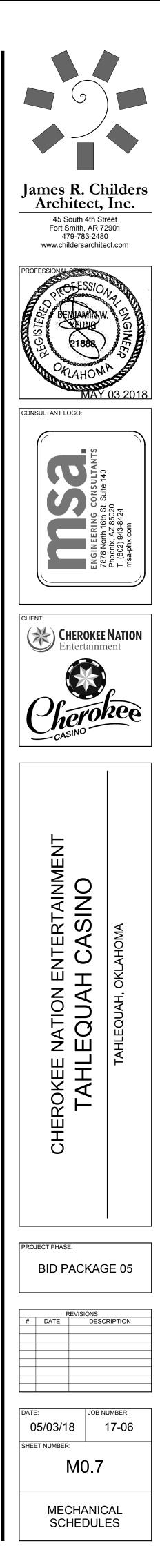
				AIR (	CURTA	IN SC	CHED	ULE			
		GI	ENERAL DATA	<b>N</b>				ELECTRIC	AL	OPERATING	
MARK	MANUFACTURER MODEL	LOCATION	LENGTH	MAX CFM AT NOZZLE	MAX FPM AT NOZZLE	MOTOR RPM	HP	FLA	V/PH/HZ	WEIGHT (LBS)	REMARKS
ACU 1	MARS 48CHS	ENTRANCE	4'-0"	4000	4000	1750	1	2.0	460/3/60	85	1, 2
	DE MICRO SWITCH AND DE WALL MOUNTING BE		FOR AUTO ON	VOFF OPERATI	ON.						

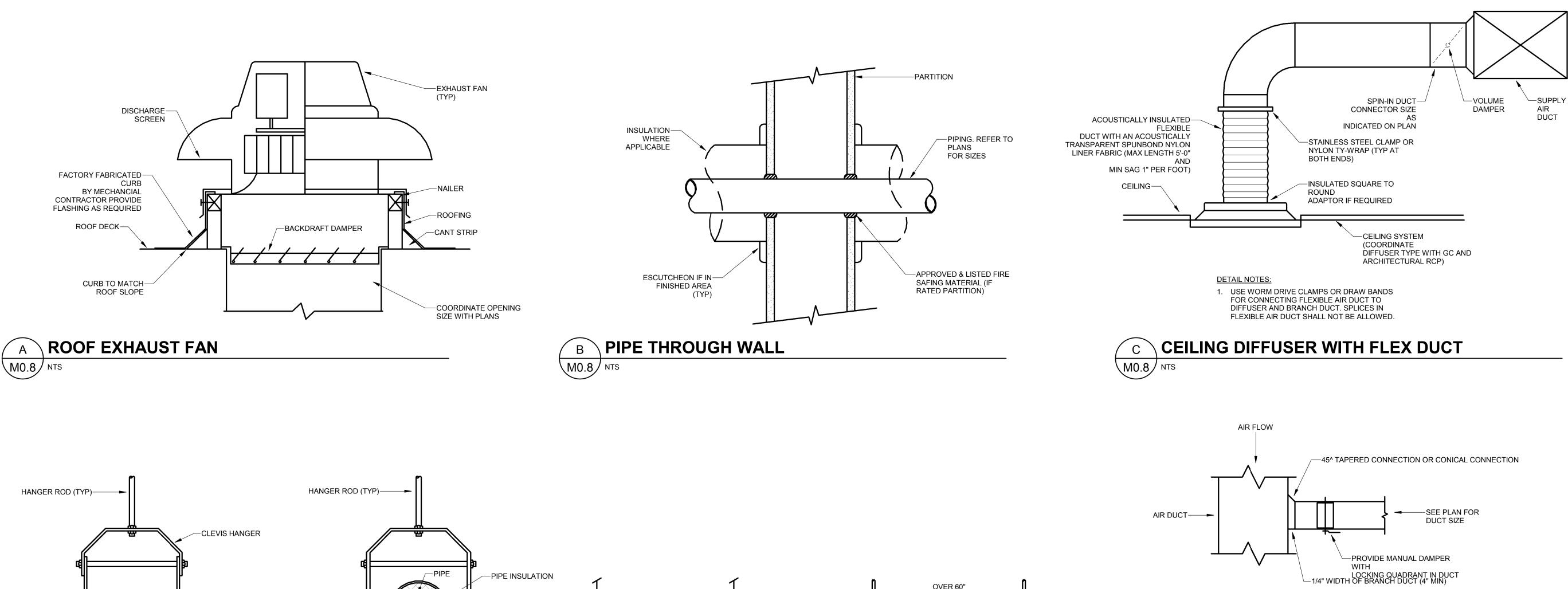
		KITC	HEN			BUIL	DING	
UNIT	SUPPLY	RETURN	OUTSIDE	EXHAUST	SUPPLY	RETURN	OUTSIDE	EXHA
AHU-1	-	-	-	-	-	-	-	-
AHU-2	-	-	-	-	-	-	-	-
AHU-3	-	-	-	-	-	-	-	-
AHU-4	-	-	-		-	-	-	-
AHU-5	-	-	-	-	-	-	-	-
AHU-6	-	-	-	-	-	-	-	-
AHU-7	-	-	-	-	-	-	-	-
AHU-8	-	-	-	-	-	-	-	-
AHU-9	-	-	-	-	-	-	-	-
AHU-10	-	-	-	-	-	-	-	-
MAU-1	-	-	-	-	-	-	-	-
MAU-2	-	-	-	-	-	-	-	-
EF-1	-	-	-	-	-	-	-	-
EF-2	-	-	-	-	-	-	-	-
EF-3	-	-	-	-	-	-	-	-
EF-4	-	-	-	-	-	-	-	-
EF-5	-	-	-	-	-	-	-	-
EF-6	-	-	-	-	-	-	-	-
EF-7	-	-	-	-	-	-	-	-
KEF-1	-	-	-	-	-	-	-	-
KEF-2	-	-	-	-	-	-	-	-
KEF-3	-	-	-	-	-	-	-	-
KEF-4	-	-	-	-	-	-	-	-
KEF-5	-	-	-	-	-	-	-	-
KEF-6	-	-	-	-	-	-	-	-
KEF-7	-	-	-	-	-	-	-	-
KEF-8	-	-	-	-	-	-	-	-
KEF-9	-	-	-	-	-	-	-	-
KEF-10	-	-	-	-	-	-	-	-
TOTAL	-	-	-		-	-	-	-

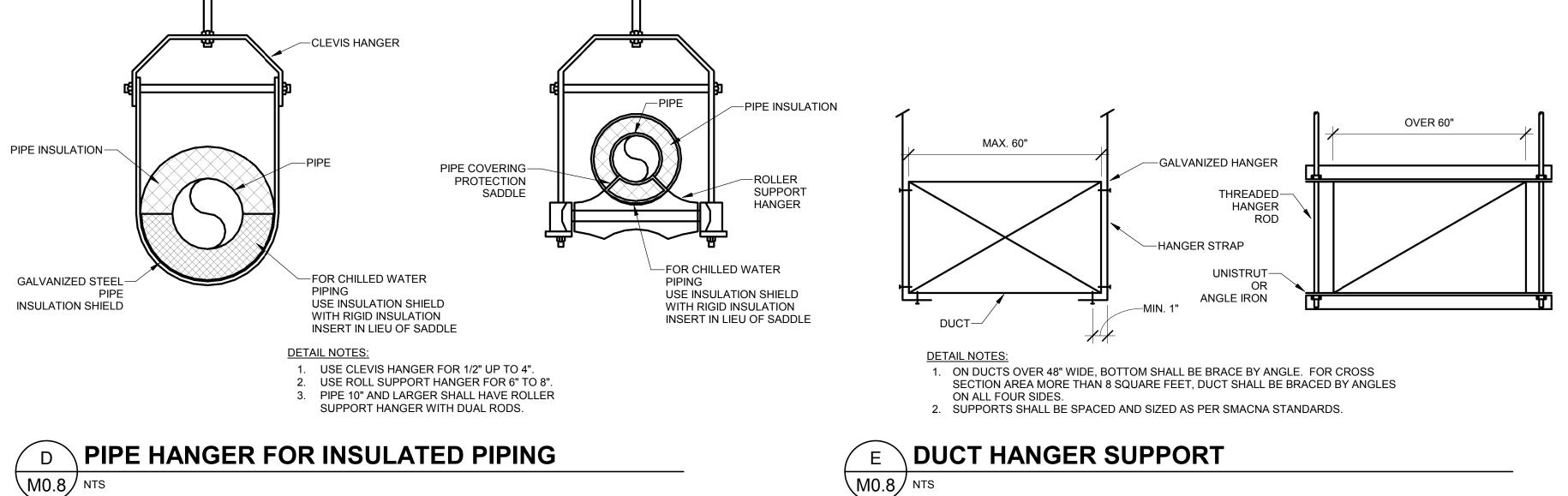


	GE	NERAL DATA			F	AN			ELEC	CTRICAL		OPERATING	
MARK	MANUFACTURER MODEL	LOCATION	SERVICE	ТҮРЕ	CFM	ESP (IN WG)	RPM	BHP	HP (W)	FLA	V/PH/HZ	WEIGHT (LBS)	REMARKS
KEF 1	GREENHECK CUBE-300XP-50	ROOF	BANQUET KITCHEN	UPBLAST CENTRIFUGAL	5150	1.75	1372	-	5	7.6	480/3/60	350	1, 2, 3, 4, 5
KEF 2	GREENHECK CUBE-240HP-50	ROOF	BANQUET KITCHEN	UPBLAST CENTRIFUGAL	4900	1.75	1113	-	5	7.6	480/3/60	350	1, 2, 3, 4, 5
KEF 3	GREENHECK CUBE-360XP-75	ROOF	FINE DINING KITCHEN	UPBLAST CENTRIFUGAL	6450	2.0	1146	-	7.5	11	480/3/60	500	1, 2, 3, 4, 5
KEF 4	GREENHECK CUBE-180HP-30	ROOF	FINE DINING KITCHEN	UPBLAST CENTRIFUGAL	2900	1.75	1490	-	3	4.8	480/3/60	250	1, 2, 3, 4, 5
KEF 5	GREENHECK CUBE-300XP-50	ROOF	GRAB-N-GO KITCHEN	UPBLAST CENTRIFUGAL	5000	2.0	1392	2.95	5	7.6	480/3/60	350	1, 2, 3, 4, 5
KEF 6	GREENHECK CUBE-240HP-30	ROOF	GRAB-N-GO KITCHEN	UPBLAST CENTRIFUGAL	4375	1.75	1066	2.09	3	4.8	480/3/60	300	1, 2, 3, 4, 5
KEF 7	GREENHECK CUBE-101HP-5	ROOF	GRAB-N-GO DISH	UPBLAST CENTRIFUGAL	600	1.0	2034	0.28	1/2	1.1	480/3/60	200	1, 2, 3, 4, 5
KEF 8	GREENHECK CUBE-141-7	ROOF	BANQUET DISH	UPBLAST CENTRIFUGAL	1100	1.0	1278	0.38	3/4	1.6	480/3/60	200	1, 2, 3, 4, 5
KEF 9	GREENHECK CUBE-101HP-5	ROOF	BANQUET DISH	UPBLAST CENTRIFUGAL	600	1.0	2034	0.28	1/2	1.1	480/3/60	200	1, 2, 3, 4, 5
KEF 10	GREENHECK CUBE-101HP-5	ROOF	FINE DINING DISH	UPBLAST CENTRIFUGAL	600	1.0	2034	0.28	1/2	1.1	480/3/60	200	1, 2, 3, 4, 5
2. PROVI	DE ROOF CURB. DE MOTOR WITH THE DE DISCONNECT SWI		DS.	4. UL 762 RATI 5. PROVIDE GI		P WITH ABSOF	RBENT MAT	ERIAL.			-	•	

## FAN SCHEDULE

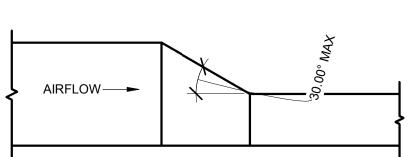






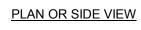


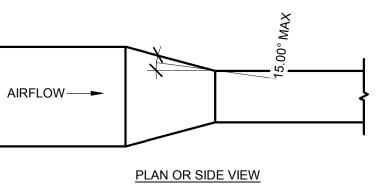




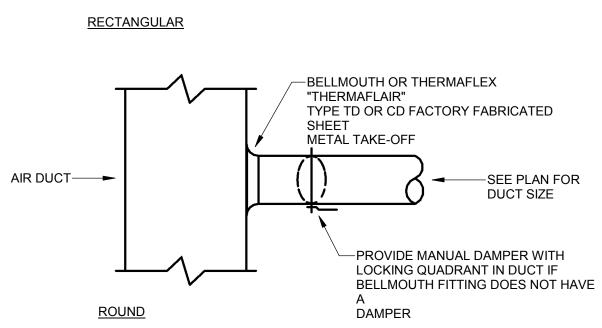


## **DUCT TRANSITION**



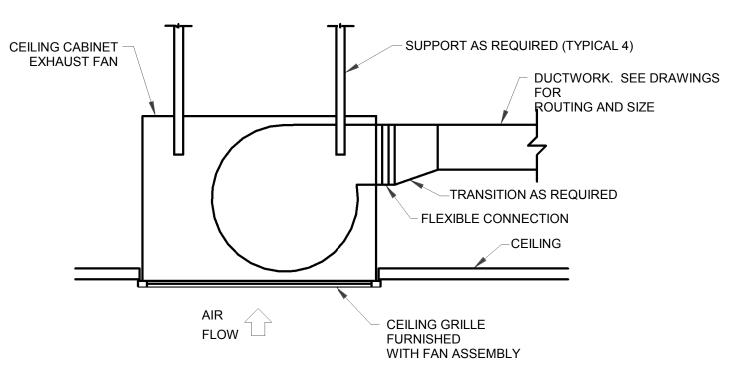


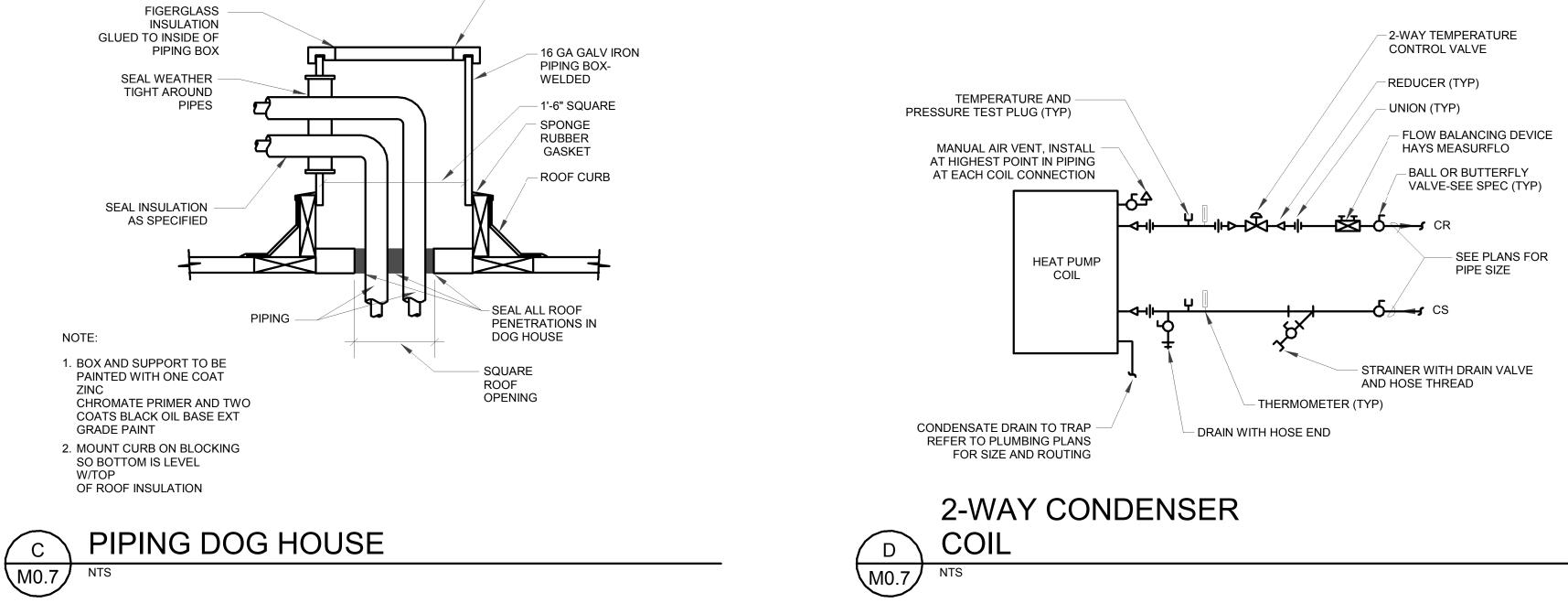
## TYPICAL BRANCH DUCT TAKE-OFF

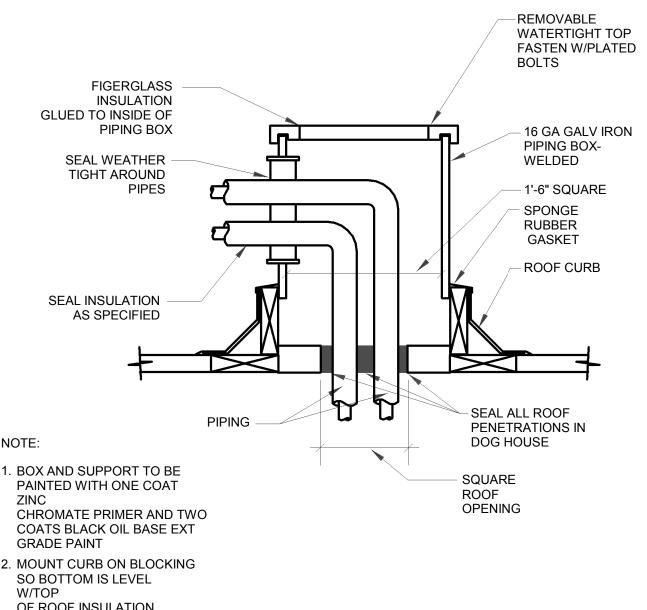


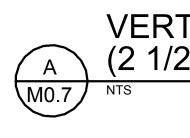
Jai	nes	R. Cl	hilders
	45 S Fort S 4 www.chi	itect, Fouth 4th St Smith, AR 7 79-783-248 Idersarchite	treet 2901 0
CONSU		EESSIO E1888 LAHON MAY	A.R. ENGINEER A. CONTRACTOR
		ENGINEERING CONSULTANTS	Phoenix, AZ 85020 T. (602) 943-8424 msa-phx.com
		HEROKEH Intertainm	NATION nent
	MENT		
	CHEROKEE NATION ENTERTAINM	TAHLEQUAH CASINO	TAHLEQUAH, OKLAHOMA
	CHEROKEE NATION ENTERTAIN	TAHLEQUAH CA	
			GE 05
#			GE 05



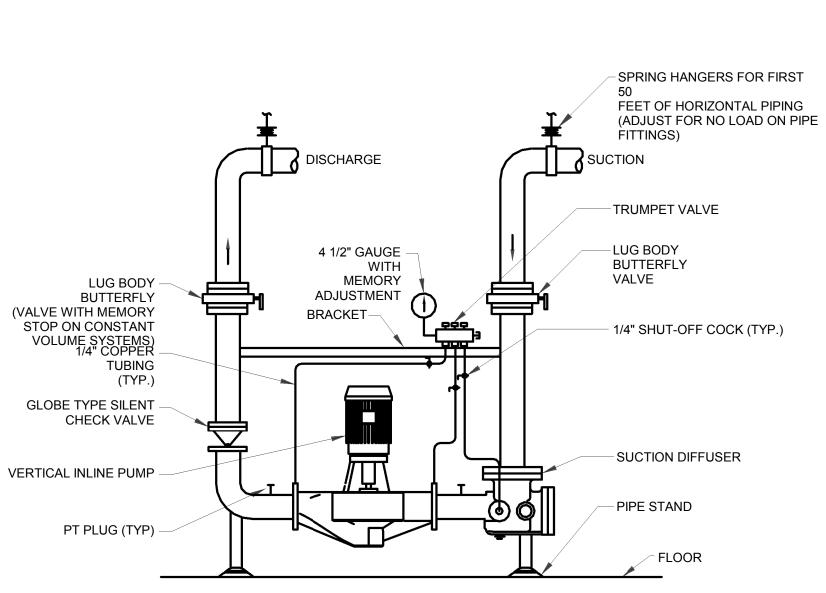




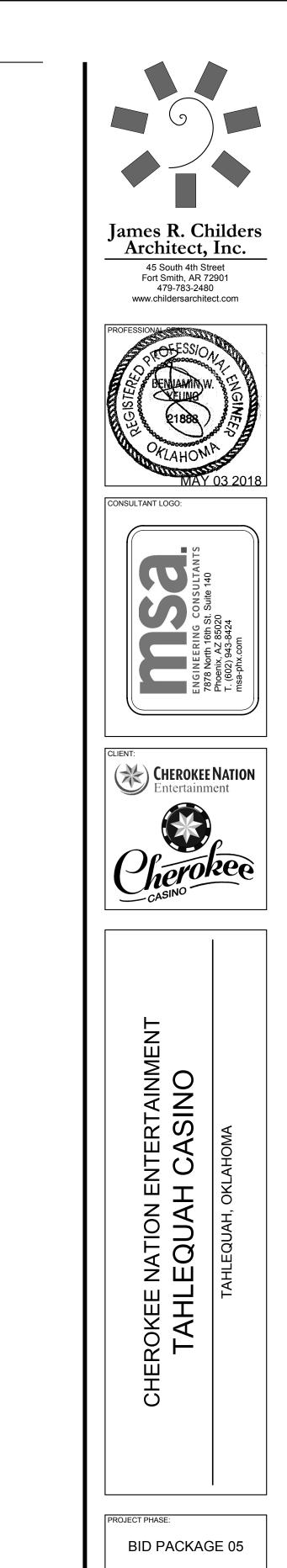




STOP ON CONSTANT VOLUME SYSTEMS) 1/4" COPPER TUBING (TYP.) GLOBE TYPE SILENT ---CHECK VALVE



# VERTICAL INLINE PUMP (2 1/2" PIPING AND OVER)

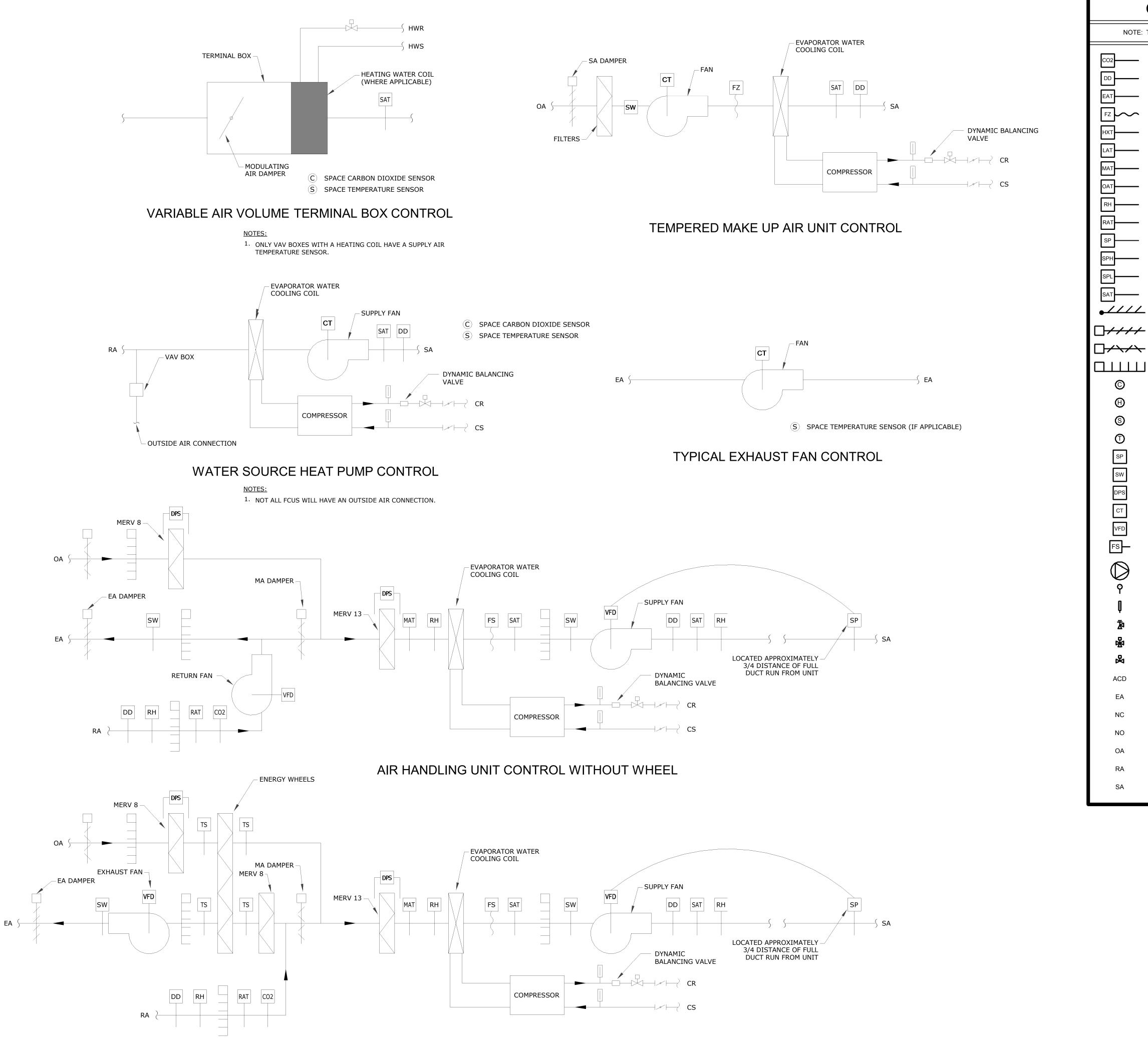


REVISIONS # DATE DESCRIPTION

DATE: JOB NUMBER: 05/03/18 17-06 HEET NUMBER

M0.9

MECHANICAL DIAGRAMS

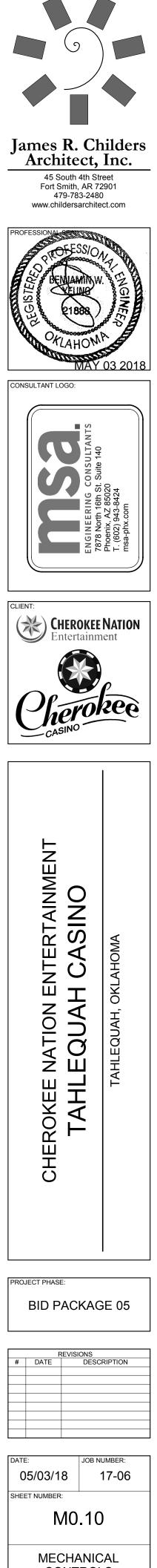


AIR HANDLING UNIT CONTROL WITH WHEEL

## **CONTROL SYMBOLS AND ABBREVIATIONS**

NOTE: THIS IS A MASTER SCHEDULE. NOT ALL SYMBOLS CONTAINED HEREIN MAY APPEAR ON THE DRAWINGS.

	DUCT MOUNTED CARBON DIOXIDE SENSOR
	DUCT TYPE SMOKE DETECTOR
	EXHAUST AIR TEMPERATURE SENSOR
	FREEZE STAT
	HEAT EXCHANGER AIR TEMPERATURE SENSOR
	LEAVING AIR TEMPERATURE SENSOR
	MIXED AIR TEMPERATURE SENSOR
	OUTDOOR AIR TEMPERATURE SENSOR
	DUCT MOUNTED RELATIVE HUMIDITY SENSOR
	RETURN AIR TEMPERATURE SENSOR
	DUCT MOUNTED STATIC PRESSURE SENSOR
	DUCT MOUNTED STATIC PRESSURE HIGH LIMIT
	DUCT MOUNTED STATIC PRESSURE LOW LIMIT
	SUPPLY AIR TEMPERATURE SENSOR
-	BACKDRAFT DAMPER
-	AUTOMATIC TEMPERATURE CONTROL DAMPER (PARALLEL BLADE TYPE)
-	AUTOMATIC TEMPERATURE CONTROL DAMPER (OPPOSED BLADE TYPE)
J	AIRFLOW MEASURING STATION
	SPACE MOUNTED CARBON DIOXIDE SENSOR
	SPACE MOUNTED RELATIVE HUMIDITY SENSOR
	SPACE MOUNTED TEMPERATURE SENSOR
	SPACE MOUNTED THERMOSTAT
	SPACE MOUNTED STATIC PRESSURE SENSOR
	SWITCH
	DIFFERENTIAL PRESSURE SENSOR
	CURRENT TRANSDUCER
	VARIABLE FREQUENCY DRIVE
	FLOW SWITCH
	PUMP
	PRESSURE GAUGE
	THERMOMETER
	RELIEF VALVE
	3-WAY ELECTRIC CONTROL VALVE, NC BYPASS LEG
	2-WAY ELECTRIC CONTROL VALVE, NC BYPASS LEG
	AUTOMATIC CONTROL DAMPER
	EXHAUST AIR
	NORMALLY CLOSED
	NORMALLY OPEN
	OUTSIDE AIR
	RETURN AIR
	SUPPLY AIR



CONTROL	S
DIAGRAM	S

		OMATION SYSTEM	
PROJEC	1: TAP		
DESCRI	PTION:	CONTROLS SEQUENCES	
			꿃쎫쪊
BUILDIN	IG AUTO	OMATION SYSTEM - BAS	
1	.00	THERE SHALL BE ONE BAS SYSTEM THAT CONTROLS THE CENTRAL PLANT AND THE BUILDING. THE CENTRAL PLANT BAS MUST BE COORDINATED WITH THE BAS MANUFACTURER. (IE: IF THE BUILDING BAS IS JCI VERSION X, THE PLANT BAS SHALL BE JCI VERSION X)	
		THE CONTROL SYSTEM SHALL HAVE A BACNET ARCHITECTURE. THE BUILDING BAS CONTRACTOR SHALL BE RESPONSIBLE FOR CONDUIT AND WIRING BETWEEN THE PLANT AND THE BUILDING BAS SYSTEM. THE BAS CONTRACTOR MUST CONTACT THE PLANT MANUFACTURING BIDDER FOR COMPLETE DETAILS AS IT RELATES TO SEQUENCES WITHIN THE PLANT OPERATIONS. THE PLANT SEQUENCES ARE PROVIDED BY THE PLANT MANUFACTURER AND COMMISSIONING OF THE PLANT SEQUENCES IS THE RESPONSIBILITY OF THE PLANT MANUFACTURER.	
		THE ABILITY TO OVERRIDE OR CONTROL PLANT SYSTEMS IS TO BE PROVIDED FROM THE BUILDING BAS FRONT END.	
2	.00	THE FOLLOWING DATA AND REQUIREMENTS RELATES TO THE BUILDING EQUIPMENT AUTOMATION SYSTEM, INCLUDING THE CENTRAL PLANT.	
		THE BAS SHALL CONTROL AUTOMATIC OPERATIONS ASSOCIATED WITH MOST INSTALLED EQUIPMENT, INCLUDING BUT NOT LIMITED TO BOILERS, FLUID COOLERS, PUMPS, AIR HANDLERS, CONTROL VALVES, VAV BOXES, WATER SOURCE HEAT PUMPS, MOTORIZED DAMPERS AND FANS. BAS COMPONENTS SHALL BE POWERED FROM THE SECONDARY POWER SOURCE (GENERATOR). TO LIMIT POWER OUTAGES ON TRANSFER FROM THE GRID TO GENERATOR THE BAS CONTRACTOR SHALL PROVIDE UPS DEVICES TO CARRY MAJOR CONTROLLERS THROUGH THE GENERATOR TRANSITION - THIS SHALL INCLUDE THE BAS COMPUTER. SEE THE ELECTRICAL DOCUMENTS FOR LOCATIONS OF POWER PROVIDED. POWER RUNS FROM THE LOCATIONS SHOWN ON THE ELECTRICAL DOCUMENTS TO THE BAS CONTROLLERS AND EQUIPMENT IS THE RESPONSIBILITY OF THE BAS CONTRACTOR - REGARDLESS OF VOLTAGE.	
		THE BAS SHALL BE A STAND ALONE FIBRE NETWORK SYSTEM AND NOT RELY ON THE BUILDING IT INFRASTRUCTURE NETWORK	
3		DEFINITIONS: TERMS USED THROUGHOUT THIS SPECIFICATION	
		GUI: GRAPHICAL USER INTERFACE. THE MAIN OPERATOR WORK STATION WHERE BAS OPERATIONS CAN BE OBSERVED AND WHERE USER INPUTS CAN HAPPEN.	
	.02	GUI ADJ: MEANS A POINT IS DISPLAYED ON THE GUI AND IS ADJUSTABLE FROM THAT SCREEN. WHEN THE POINT IS ADJUSTED, IF A PROGRAM DEFAULT VALUE EXISTS THAT POINT VALUE SHALL BE DISPLAYED AND THE NEW VALUE DISPLAYED ADJACENT AND IN A DIFFERENT COLOUR.	
	.03	BAS, BUILDING AUTOMATION SYSTEM = FMS, FACILITIES MANAGEMENT SYSTEM = BMS, BUILDING MANAGEMENT SYSTEM = DDC,	
+	.04	DIRECT DIGITAL CONTROL SYSTEM = EMS, ENERGY MANAGEMENT SYSTEM FAIL EQUIPMENT DEFINITION:	
	.041	FOR A HEAT PUMP MEANS STOP THE FAN, CLOSE COIL CONTROL VALVES AND IF APPLICABLE, CLOSE THE VENTILATION AIR CONNECTION VAV BOX AND ALARM.	
-+	.042	FOR A VAV BOX MEANS CLOSE THE VAV BOX, CLOSE THE HEATING CONTROL VALVE (IF APPLICABLE) AND ALARM.	
		FOR AN EXHAUST FAN MEANS TURN OFF THE FAN, ISOLATE WHERE APPLICABLE AND ALARM.	
		FOR AN AIR HANDLING UNITS MEANS STOP FAN(S), CLOSE OUTSIDE AIR AND EXHAUST AIR DAMPERS, OPEN MIXED AIR DAMPER IF AVAILABLE, CLOSE THE CONDENSER COIL VALVE – IF A MIXED AIR TEMPERATURE TRANSMITTER EXISTS MODULATE THE HEATING COIL VALVE TO MAINTAIN 55°F, FREEZE STAT REMAINS OPERATIONAL; IF AN ENERGY RECOVERY WHEEL EXISTS, STOP THE WHEEL. ALARM THE CONDITION.	
	.045	FOR MAKE-UP AIR UNITS MEANS STOP FAN(S), CLOSE COIL CONTROL VALVES, CLOSE THE OUTSIDE AIR DAMPER, FREEZE STAT REMAINS OPERATIONAL AND ALARM.	
4		GENERAL:	
	.01	ALARMS: SHALL BE NOTED ON THE GUI AND REQUIRE USER INPUT THROUGH THE WORK STATION TO RESET FOR NCRMAL OPERATION TO RESUME. WHEN RESET THE SYSTEM SHALL REVERT IN A CONTROLLED MANNER TO THE NORMAL OPERATING SEQUENCE.	
	.02	ALERTS: SHALL BE NOTED ON THE GUI AND RECORD OF THE EVENT SHALL REMAIN UNTIL CLEARED BY THE OPERATOR, IF THE SYSTEM OR CONDITION CLEARS ITSELF THE EQUIPMENT IS ALLOWED TO RETURN TO NORMAL CONTROL SEQUENCE AND THE ALERT SHALL CHANGE COLOUR STATUS TO INDICATE NORMAL OPERATION HAS RESUMED. THE ALERT MUST BE CLEARED THROUGH THE GUI.	
		EACH PIECE OF EQUIPMENT CONTROLLED BY THE BAS SHALL HAVE AN AUTO/OFF/MAINTENANCE/ALARM/ALERT SWITCH ON THE GUI. <u>AUTO</u> COMMAND WILL PLACE THE EQUIPMENT UNDER BAS CONTROL. USER INPUTS AND COMMANDS ARE ALLOWED TO CHANGE/OVERRIDE BAS PROGRAMMED OPERATIONS. ANY USER INPUT SHALL BE IDENTIFIED BY COLOUR CHANGE OR TAG UNTIL RELEASED TO AUTO MODE. ANY USER INPUTS SHALL TIME OUT AND RETURN TO PROGRAMMED OPERATION AFTER 7 DAYS. THE COUNT DOWN TIMER SHALL DISPLAY ON THE GUI AND NOTE COMMAND TO BE RESET. (MAY BE MULTIPLE TIMERS, ACCEPTABLE TO GO TO A SECOND SCREEN). <u>OFF</u> COMMAND WILL STOP THE UNIT, WHERE APPLICABLE CLOSES ASSOCIATED VALVES, DAMPERS AND DOES NOT ALLOW ANY MANUAL INPUTS FROM THE GUI – DISPLAY ALERT STATUS.	
		MAINTENANCE TURNS THE EQUIPMENT OFF, CLOSES ASSOCIATED VALVES, DAMPERS AND ALLOWS MANUAL OVERRIDES FROM THE GUI. WHEN USER INPUTS ARE INSERTED TO OVERRIDE A CONDITION, THE OVERRIDE SHALL CHANGE STATE ON THE GUI VIA COLOUR OR TAG TO NOTE OVERRIDE – DISPLAY ALERT STATUS. ALARM CONDITION NOTES A FAILURE THAT NEEDS USER NPUT TO CORRECT. EQUIPMENT WILL NOT TRY TO RESTART UNTIL THE ALARM IS ACKNOWLEDGED. IN THE CASE OF MULTIPLE PECES OF EQUIPMENT SERVING A COMMON SOURCE – IE: BOILERS, CONDENSER WATER PUMPS AND HEATING SYSTEM SECONDARY PUMPS, IF THE BAS ATTEMPTS TO START A PIECE OF EQUIPMENT IN ALARM THE BAS SHALL AUTOMATICALLY GO TO THE NEXT AVAILABLE PIECE OF EQUIPMENT - DISPLAY ALARM STATUS. ALERT CONDITION NOTES A NON-CRITICAL CONDITION EXISTED THAT CAUSED THE EQUIPMENT TO OPERATE OUTSIDE OF NORMAL OPERATING CONDITIONS FOR A GIVEN TIME FRAME - DISPLAY ALERT	

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PROJEC	CT: TA	HLEQUAH CASINO
DESCRI	PTION:	CONTROLS SEQUENCES
10	.00	OPERATOR WORKSTATION - MINIMUM REQUIREMENTS
		THE WORKSTATION SHALL BE HARD WIRE CONNECTED TO THE BAS NETWORK.
		DELL XPS, TOWER 17, QUAD CORE - 6TH GEN PROCESSOR. OS OPTIONS: WINDOWS 7 PROFESSIONAL WITH XP MODE, 64-BIT, WINDOWS 10, WINDOWS SERVER 2012R.
		PROVIDE A GRAPHICS CARD SOLUTION TO DRIVE FOUR WINDOWS ON ONE DISPLAY AND ONE WINDOW ON THE SECOND DISPLAY.
		3840 x 2160 RESOLUTION.
		16 GB DDR3 NON-ECC SDRAM, 1600 MHZ (2 DIMM) 2 – 1 TB PCLe SOLID-STATE DRIVES, IN RAID 1 CONFIGURATION.
		16X DVD +/-RW AND 16XDVD, ROXIO CREATOR CYBERLINKPOWER DVD
		NETWORK INTERFACE CARD (10/100/1000 MBPS)
		CHASSIS INTRUSION SWITCH
		INTERNAL BUSINESS AUDIO SPEAKER KEYBOARD AND OPTICAL MOUSE
		DUAL, DELL P4317Q MONITORS, SET UP ONE MONITOR TO HAVE FOUR SCREENS, THE OTHER TO HAVE ONE SCREEN. ALL
		SCREENS TO BE DIFFERENT VIEWS. (BOTH MONITORS MOUNTED TO THE WALL) POWER SUPPLY SHALL NOT BE MORE THAN 60% LOADED.
		POWER SUPPLY AND CPU COOLING FANS TO BE TEMPERATURE CONTROLLED AND VARIABLE SPEED.
11		1500 VA TRUE SIGN WAVE UPS SCOPE OF WORK
		BAS CONTRACTOR IS RESPONSIBLE FOR ALL WIRING AND POWER NEEDS FOR THEIR EQUIPMENT, REGARDLESS OF VOLTAGE. THE BAS SYSTEM POWER SHALL BE TAKEN FROM A GENERATOR BACKED UP SOURCE AT A POWER PANEL. IN SOME CASES THE ELECTRICAL DIVISION HAS PROVIDED POWER FOR CONTROL PURPOSES, THIS POWER SHALL BE USED IN LIEU OF THE CONTRACTOR EXTRACTING POWER FROM EQUIPMENT FEEDS. ELECTRICAL HAS PROVIDED POWER TO THE MAJORITY OF VAV BOXES AND VAN COILS. FOR COMMUNICATION BETWEEN THE BUILDING BAS AND THE PACKAGED PLANT: THE ELECTRICAL DIVISION HAS PROVIDED A 2" CONDUIT BETWEEN THE CASINO BUILDING AND THE PLANT - WIRING BY THE BAS CONTRACTOR. SEE ELECTRICAL DOCUMENTS FOR PANEL AND CONDUIT LOCATIONS. IF ADDITIONAL CONDUIT OR LARGER CONDUIT IS REQUIRED THE BAS CONTRACTOR IS RESPONSIBLE FOR THEIR NEEDS.
		BAS CONTRACTOR IS RESPONSIBLE TO PROVIDE A COMPLETE AND FUNCTIONAL DDC BUILDING AUTOMATION SYSTEM RESPONSIBLE FOR THE CONTROL OF ALL MECHANICAL SYSTEM COMPONENTS UNLESS STATED OTHERWISE. THE BAS CONTRACTOR SHALL PROVIDE A MINIMUM OF 20 HOURS TRAINING IN 5 FOUR HOUR SESSIONS. (THIS MAY EXCEED BOOK SPECIFICATION REQUIREMENTS.) THE "CENTRAL PLANT IN A BOX" SECTION OF THE BAS IS TO OPERATE THE BOILERS, FLUID COOLER, INSIDE THE BOX CONTROL VALVES, CHILLER CONTROL VALVES AND INSIDE THE BOX PUMPS. EVEN THOUGH THE PLANT IN THE BOX IS A SINGLE ITEM
	04	PROVIDED TO THE OWNER, THE BAS SHALL BE THE SAME SYSTEM AND CONTROLLED BY THE BUILDING BAS. THE BAS CONTRACTOR SHALL CONTACT THE "BOX" CONTRACTOR TO ARRANGE FOR FACTORY WIRING OF CONTROLS AND FINAL SEQUENCES. THE GUI MUST DISPLAY ALL CONTROL AND INFORMATION POINTS, SUCH AS: a. BOILER STATUS, FIRING RATE
		b. PUMP STATUS, SPEED, AMPS
		c. BOILER ISOLATION VALVE STATUS
		d. CONDENSER WATER SUPPLY TEMP
		e. CONDENSER WATER RETURN TEMP f. HEATING WATER SUPPLY TEMP
		g. HEATING WATER RETURN TEMP
		i. BOILER RUN TIME
		j. PUMP RUN TIME
		k. CENTRAL PLANT ENABLE/DISABLE CONTROL
		L. FLUID COOLER FAN SPEED STATUS
		m. FLUID COOLER ISOLATION VALVE STATUS
		n. MAKE - UP WATER CONTROL VALVE POSITION
		0. BASIN HEATER STATUS
		q. EQUIPMENT LEAD/LAG SCHEDULE t. BOILER WATER FLOW
		u. BOILER WATER FLOW U. BOILER BYPASS VALVE COMMAND, HWBP-1
SEQUE	NCES	
AHU:		
	GENER	
12	.00	AHUS ARE ANNEXAIR HEATPUMPS WITH FACTOR OPERATING CONTROLS WITH LIMITED BAS INPUT. THE AHUS ARE EQUPPED WITH A BACNET INTERFACE FOR BAS CONNECTION AND MAPPING OF POINTS.
	.01	AHUS 1 AND 8: THESE ARE CONSTANT VOLUME UNITS. THE BAS IS TO PROVIDE A SPACE TEMPERATURE TRANSMITTER AND SEND
		THAT INFORMATION TO THE AHU FOR AHU OPERATION. AHUS 2, 3, 6, 7: THESE UNITS ARE CONSTANT VOLUME UNITS. THE BAS IS TO PROVIDE A DUCT SUPPLY AIR TEMPERATURE
		TRANSMITTER, A MINIMUM OF 20 FEET FROM THE UNIT, AND IS TO SEND THAT INFORMATION TO THE AHU FOR OPERATION.

		DMATION SYSTEM
SCRI	PTION:	CONTROLS SEQUENCES
		DURING COMMISSIONING THE CONTROLS CONTRACTOR SHALL ADJUST THE INITIAL SET POINTS TO ACHIEVE A STABLE OPERATING CONDITION. CASINO FRONT AND BACK OF HOUSE EQUIPMENT OPERATING SCHEDULE WILL BE PROVIDED BY FACILITIES OR OWNER OPERATIONS DURING COMMISSIONING. OPTIONS ARE 24/7 OR A TIMED SETBACK SCHEDULE. INITIAL TEMPERATURE SET BACK, UNLESS NOTE BY THE OWNER WILL BE 5°F OFF SET POINT. INITIAL TEMPERATURE SET POINTS: CASINO FLOOR – 72°F; RESTAURANTS – 75° COOLING, 70 HEATING; OFFICES AND MOST BOH SPACES – 75°F COOLING, 70° HEATING. THE CENTRAL PLANT IS A 24/7 OPERATION. SPACE SET POINTS WILL HAVE A STANDARD +/-2°F DEADBAND (ADJ PER SPACE) ALERT ANY SPACE 5°F ABOVE OR BELOW SET POINT FOR MORE THAN 30 MINUTES.
	.06	DURING AND AFTER COMMISSIONING THE CONTROLS CONTRACTOR SHALL ALLOW FOR UP TO 80 HRS TOTAL OF PROGRAM CHANGES AS DIRECTED BY THE ENGINEER OR THEIR DESIGNATE.
5	.00	GLOBAL COMMANDS TO BE AVAILABLE FROM THE GUI
		ENABLE/DISABLE CENTRAL PLANT CONDENSER WATER / CONDENSER COMPONENTS
_		ENABLE/DISABLE CENTRAL PLANT HEATING WATER COMPONENTS
-+		OPEN/CLOSE ALL VAV BOX CS/CR VALVES ASSOCIATED WITH EACH AHU OPEN/CLOSE ALL VAV BOX HW VALVES ASSOCIATED WITH EACH AHU
		OPEN CLOSE ALL VAV BOX DAMPERS ASSOCIATED WITH EACH AHU
	.06	OPEN CLOSE ALL VAV BOX HEATING COIL VALVES ASSOCIATED WITH EACH AHU
		OPEN/CLOSE ALL FCU CS/CR WATER VALVES PER LEVEL
		OPEN/CLOSE ALL FCU HW WATER VALVES PER LEVEL OPEN/CLOSE ALL AHU CS/CR WATER VALVES
_		OPEN/CLOSE ALL AHU HW WATER VALVES
6		THE BAS SHALL BE WEB ACCESSIBLE. THE BAS CONTRACTOR TO PROVIDE THE LINE TO THE INTERNET AND PAY FOR SERVICE FOR THE FIRST YEAR FROM SYSTEM ACCEPTANCE. THE BAS WEB ACCESS SHALL BE MADE AVAILABLE TO THE ENGINEER FOR VIEWING.
	.01	THE CONTROL SYSTEM SHALL BE DESIGNED AND PROGRAMMED FOR THE ULTIMATE PLANT EQUIPMENT BUILD-OUT. EQUIPMENT
	.02	NOT INSTALLED SHALL BE TAGGED AS OFF. SPACE TEMPERATURE TRANSMITTERS SHALL HAVE A FIELD ADJUSTABLE SPACE TEMPERATURE AND BE CAPABLE TO DISPLAY THE SET POINT. ENABLE/DISABLE OF THE FIELD ADJUSTABLE TEMPERATURE CONTROL SHALL BE SET FROM THE GUI. THE RANGE OF ADJUSTABILITY SHALL BE SET FROM THE GUI. DEFAULT IS NO FIELD CONTROL. WHEN ENABLED, DEFAULT FIELD CONTROL IS DOWN TO 70°F. UP TO 80°F
		AHU TEMPERATURE SENSORS SHALL BE CAPILLARY TUBE TYPE AND THE CAPILLARY TUBE IS TO BE MINIMUM 1 FOOT LONG FOR EACH SQUARE FOOT OF COIL/DUCT OPENING.
7		MISC GUI DISPLAY ITEMS: OUTSIDE AIR TEMPERATURE
		OUTSIDE AIR HUMIDITY
	.03	SPACE TEMPERATURE SET POINT
		SPACE TEMPERATURE
		SPACE HUMIDITY SET POINT SPACE HUMIDITY
		SPACE CO2 SET POINT (WHERE APPLICABLE)
		SPACE CO2
		CONTROL VALVES SHALL NOTE "% OPEN"
		DAMPERS SHALL NOTE "% OPEN" VFDS SHALL NOTE "%SPEED " OR "HZ"
		VFDS SHALL NOTE "%SPEED " OR "HZ" VFD DEVICES SHALL DISPLAY CURRENT DRAW
		DUCT DETECTOR STATUS FOR ASSOCIATED AIR HANDLER (AHU, MAU, FCU, FAN)
		CASINO FLOOR BUILDING STATIC PRESSURE RELATIVE TO EXTERIOR
		CASINO FLOOR PLENUM STATIC PRESSURE RELATIVE TO ABOVE THE FLOOR
		BUILDING POWER SOURCE – LOCAL UTILITY OR GENERATOR CENTRAL PLANT MAIN EQUIPMENT HOUR METERS OF OPERATION - BOILERS, PUMPS
8		CONTROL VALVES AND FLOW METERS
		HEAT PUMP/AHUS ARE TO BE PROVIDED OPEN/CLOSE BALL OR BUTTERFLY VALVES (NIL PRESSURE DROP) THAT OPEN OF COMPRESSOR ACTIVATION AND CLOSE WHEN THE COMPRESSOR DEMAND IS OFF (PLUS A TIME DELAY)
		FLOW METERS TO BE FLEXIM FLUXUS F704 WITH CLAMP ON TRANSDUCERS. METER IS ILLUSTRATED ON THE PLANT DIAGRAM, BU A STRAIGHT LENGTH OF PIPE MUST BE LOCATED FOR THE INSTALL - 10 STRAIGHT PIPE DIAMETERS BEFORE THE SENSORS AND AFTER WITH NO TEES, VALVES, ETC IN THE RUN.
	.03	ULTRASONIC FLOW METERS: (TURBINE TYPE INSERTION METERS ARE NOT ACCEPTABLE) THE PLANT MANUFACTURER IS TO PAY CLOSE ATTENTION TO THE REQUIRED STRAIGHT PIPE DISTANCES REQUIRED FOR METERS TO OPERATE CORRECTLY. WHERE MANUFACTURER RECOMMENDED STRAIGHT PIPE DISTANCES CANNOT BE MAINTAINED THE ULTRASONIC METER IS TO BE REPLACED BY A MAGNETIC FLOW METER BY CADILLAC METER - CMAG, THAT DOES NOT REQUIRED ANY STRAIGHT PIPE LENGTHS BEFORE OR AFTER THE METER.
9		GENERAL
	.01	WHERE THERE IS INSUFFICIENT ROOM TO FIELD INSTALL A FREEZE STAT OR OTHER TEMPERATURE SENSOR DUE TO COILS BEING TIGHT TOGETHER, AIR HANDLERS MAY BE PROVIDED WITH FACTORY DEVICES - COORDINATE WITH THE EQUIPMENT SUPPLIER TO ENSURE COMMUNICATION WITH THE DEVICES.
	.02	DP TRANSMITTERS SHALL BE HARD WIRED BACK TO THE CONTROLLER UTILIZING THE DEVICE FOR INPUT SIGNAL. NETWOR CONNECTIONS ARE NOT ALLOWED.

		DMATION SYSTEM	$\prod$
SCRI	PTION:	CONTROLS SEQUENCES	
		AHUS 4, 5, 9, 10: THESE UNITS ARE VAV UNITS. THE BAS IS TO PROVIDE A DUCT SUPPLY AIR TEMPERATURE TRANSMITTER, A MINIMUM OF 20 FEET FROM THE UNIT, AND IS TO SEND THAT INFORMATION TO THE AHU FOR OPERATION. THE BAS IS TO PROVIDE A DP TRANSMITTER IN THE DUCTWORK, LOCATED APPROXIMATELY 2/3 OF THE DISTANCE DOWN THE LONGEST DUCT RUN FROM THE AHU. (UPON FAILURE OF THE SENSOR, FAULT TO THE LAST KNOW FAN SPEED AND ALARM.) THE TAB CONTRACTOR IS TO PROVIDE THE DP SETPOINT. THE DUCT TEMPERATURE SETPOINT IS TO BE STE INITIALLY AT 55°F. THE BAS IS TO PROVIDE A SUPPLY AIR TEMPERATURE RESET FUNCTION THAT WILL RESET THE SUPPLY AIR TEMPERATURE SETPOINT UPWARD UNTIL AT LEAST ONE VAV BOX IS OPEN 95% IN COOLING MODE. RESET SHALL REVERSE AS VAV BOXES OPEN BEYOND 95%.	
		MAUS 1, 2: THESE ARE VAV UNITS. THE BAS IS TO PROVIDE A DUCT SUPPLY AIR TEMPERATURE TRANSMITTER, A MINIMUM OF 20 FEET FROM THE UNIT, AND IS TO SEND THAT INFORMATION TO THE AHU FOR OPERATION. THE BAS IS TO PROVIDE A DP TRANSMITTER IN THE DUCTWORK, LOCATED APPROXIMATELY 2/3 OF THE DISTANCE DOWN THE LONGEST DUCT RUN FROM THE AHU. (UPON FAILURE OF THE SENSOR, FAULT TO THE LAST KNOW FAN SPEED AND ALARM.) THE TAB CONTRACTOR IS TO PROVIDE THE DP SETPOINT. THE DUCT TEMPERATURE SETPOINT IS TO BE STE INITIALLY AT 65°F.	
		AHUS ARE TO BE PROVIDED OPEN/CLOSE BALL OR BUTTERFLY VALVES (NIL PRESSURE DROP) THAT OPEN ON COMPRESSOR ACTIVATION AND CLOSE WHEN THE COMPRESSOR DEMAND IS OFF (PLUS A TIME DELAY) - THIS SIGNAL SHOULD COME FROM THE HEAT PUMP.	
13	00 VAV	DXES THE VARIABLE AIR VOLUME BOX SHALL MODULATE TO MAINTAIN TEMPERATURE SET-POINT WITHIN THE ZONE IT SERVES. THE BOX SHALL CONTROL BETWEEN ITS PRE-SET MAXIMUM AND MINIMUM VOLUMETRIC AIR FLOW SET-POINTS PROVIDED BY THE AIR BALANCER AND A NOTED ON THE VAV BOX SCHEDULE. THESE SET POINTS TO BE ADJUSTABLE FROM THE GUI.	
	.01	IF THE VARIABLE AIR VOLUME BOX IS EQUIPPED WITH A RE-HEAT MECHANISM, AND THE SPACE TEMPERATURE IS BELOW ITS TEMPERATURE SET-POINT FOR MORE THAN 60 SECONDS, AND THE VARIABLE AIR VOLUME BOX IS AT ITS MINIMUM POSITION THEN MODULATE THE RE-HEAT CONTROL VALVE AND RESET THE VAV BOX DAMPER TO THE DESIGNATED HEATING CFM VALUE (ADJ).	
		IF A VAV BOX WITHOUT REHEAT CAPABILITY IS AT ITS MINIMUM POSITION AND THE SPACE TEMPERATURE IS BELOW ITS TEMPERATURE SET-POINT FOR MORE THAN 600 SECONDS THEN ALERT THE GUI.	
	.03	NORMALLY UNOCCUPIED SPACES SUCH AS MEETING ROOMS, IF THE VAV BOX DOES NOT HAVE REHEAT AND THE BOX MINIMUM POSITION SHALL BE FULL CLOSED NOT THE BOX MINIMUM. THE BOX SHALL NOT TRY TO MODULATE BETWEEN THE NOTED MINIMUM AND FULL CLOSED.	
	HEAT P		
14		THESE ARE CONSTANT VOLUME UNITS. THE BAS IS TO PROVIDE A SPACE TEMPERATURE TRANSMITTER AND SEND THAT INFORMATION TO THE HEAT PUMP FOR HEAT PUMP OPERATION.	
		HEAT PUMPS ARE TO BE PROVIDED OPEN/CLOSE BALL OR BUTTERFLY VALVES (NIL PRESSURE DROP) THAT OPEN ON COMPRESSOR ACTIVATION AND CLOSE WHEN THE COMPRESSOR DEMAND IS OFF (PLUS A TIME DELAY) - THIS SIGNAL SHOULD COME FROM THE HEAT PUMP.	
15		ST FANS THE BAS IS TO PROVIDE STOP/START FOR ALL EXHAUST FANS. PROVIDE A SCHEDULE AS REQUESTED BY THE OWNER. PROVIDE	
15		A RIB IF NECESSARY FOR STOP/START CONTROL. PROVIDE A CT FOR STATUS.	
		FOR KITCHEN GREASE EXHAUST FANS PROVIDE AN INTERLOCK FOR MAKE-UP AIR ASSOCIATED WITH KITCHEN GREASE EXHAUST FANS. START THE MAU AND MODULATE THE VAV BOX TO MATCH DESIGNED CFM. (NOTE: MAKE UP AIR IS TO SHUT OFF DURING AN ANSUL TRIP - VAV BOX CLOSES 100%, MAU DOES NOT STOP IF OTHER HOODS ARE OPERATIONAL.	
NUF	ACTURI	ED CENTRAL PLANT	
25	.00	THE FINAL SEQUENCES FOR PLANT OPERATION ARE CREATED BY THE PACKAGED PLANT MANUFACTURER. SEQUENCES ARE TO BE SUBMITTED TO THE ENGINEER FOR REVIEW. SEQUENCES SHALL BE WRITTEN TO MAXIMIZE ENERGY EFFICIENCY AND PROMOTE EQUIPMENT USAGE THAT LIMITS SHORT CYCLING OF THE EQUIPMENT. WHERE EQUIPMENT IS HEADERED, EQUIPMENT SEQUENCING SHALL NOT BE LIMITED TO DEDICATED EQUIPMENT. IE: BOILER #1 AND PUMP #1 SHALL NOT BE DEDICATED. ANY BOILER SHALL BE ABLE TO OPERATE WITH ANY PUMP OR FLUID COOLER. THIS APPLIES TO ALL SIMILAR SYSTEMS. SEQUENCES OF THE PLANT WILL BE COMMISSIONED AS PART OF THE BUILDING COMMISSIONING PROGRAM. ALLOW FOR FIELD PROGRAMMING TO CORRECT PROBLEMS NOTED DURING COMMISSIONING.	
	.01	ALL PLANT EQUIPMENT SHALL BE ROTATED BASED UPON RUN TIME HOURS TO EQUALIZE EQUIPMENT RUN TIME. PROVIDE THE ABILITY TO RESET THE RUN TIMER. RUN TIMER SHALL BE VISIBLE ON BOTH GUI DISPLAYS.	
		DN	



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Project: TAHLEQUAH CASINO			I/O T				
Description: Controls Points List - All points are not necessarily defined here.			A0			REV:	REV:
						$\square$	
CONSTANT OR VARIABLE AIR VOLUME AIR HANDLING UNIT WITH OR W/O ENERGY WHEEL	AND DI	EHUI	MIDIF				
Duct Static Pressure Set-Point	-+		Х				
Duct Static Pressure		Х	~				
AHU-X SFan S/S					Х		
AHU-X SFan Status or VFD Run Status				Х			
AHU-X SVFD Command Fan Speed			Х				
AHU-X SVFD Fan Speed		Х					
AHU-X SVFD Alarm	_			Х			
AHU-X EF OR RFan S/S (Each Fan)				v	Х		
AHU-X EF OR RFan Status or VFD Run Status (Each Fan) AHU-X EVFD OR RVFD Command Fan Speed (Each Fan)			х	Х	-		
AHU-X EVFD OR RVFD Command Fan Speed (Each Fan) AHU-X EVFD OR Speed (Each Fan)		х	^		-		
AHU-X EVFD OR RVFD Alarm (Each Fan)		~		Х			
AHU-X Supply Air Volume (Each Fan)		Х					
AHU-X Supply Air Volume Total		C					
AHU-X Return Air Volume (Each Fan)		Х					
AHU-X Return Air Volume Total		С					
AHU-X Energy wheel S/S					Х		
AHU-X Energy Wheel Status or VFD Run Status				Х			
AHU-X Energy Wheel VFD Command speed	$\rightarrow$	~	Х		<u> </u>		
AHU-X Energy Wheel VFD speed AHU-X Energy Wheel VFD Alarm		Х		Х	<u> </u>		
AHU-X OSA Damper Command			Х	<u>^</u>	-		
AHU-X OSA Damper Position	-+	Х	^				
AHU-X RA Damper Command		~	Х				
AHU-X RA Damper Position		Х					
AHU-X EA Damper Command			Х				
AHU-X EA Damper Position		Х					
AHU- X OAT before wheel	_	Х					
AHU- X OAT after wheel		X			<u> </u>		
AHU-X Mixed Air Temperature - before cooling coil AHU-X Supply Air Temperature after heating coil		X X			<u> </u>		
AHU-X Supply Air Temperature after cooling coil	-+	Ŷ			<u> </u>		
AHU-X Unit Discharge Air Temperature		X					
AHU-X Discharge Air Temperature Command		~	Х				
AHU-X Return Air Temperature		Х					
AHU-X Exhaust Air Temp after wheel		Х					
AHU-X Space Humidity		Х					
AHU-X Return Air Humidity		Х					
AHU-X Supply Air Humidity - 20 ft from unit.		X X			<u> </u>		
AHU-X Return air CO2 AHU-X CW Valve Command		Ň	х		-		
AHU-X Supply Air Duct Detector			^	Х	-		
AHU-X Freeze Temp Detector				X			
AHU-X SA Fan Low static pressure alarm				X			
AHU-X Supply Air Filter #1 static pressure		Х					
AHU-X Supply Air Filter #2 static pressure		Х					
AHU-X Return Air Filter static pressure		Х					
AHU-X Status vs Command Alert		С					
CONSTANT AIR VOLUME OR VAV AIR HANDLING							
AHU-X SFan S/S					Х		
AHU-X SFan or VFD Run Status				Х			
AHU-X EFan S/S (Each Fan)				<u> </u>	V		

Building Automation System Points List (minimum)							
Project: TAHLEQUAH CASINO		I/O T	YPE				
Description: Controls Points List - All points are not necessarily defined here.	AI	AO	DI	DO	REV:	REV:	REV:
AHU-X EFan VFD Run Status (Each Fan)			х				
AHU-X EFan VFD Command Fan Speed (Each Fan)		Х					
AHU-X EFan VFD Fan Speed (Each Fan)	X						
AHU-X EFan VFD Alarm (Each Fan)			Х				
AHU-X OSA Damper Command		Х					
AHU-X OSA Damper Position	Х						
AHU-X RA Damper Command		Х					
AHU-X RA Damper Position	Х						
AHU-X EA Damper Command		Х					
AHU-X EA Damper Position	X						
AHU-X Mixed Air Temperature - before heating	X						
AHU-X Supply Air Temperature after heating coil	X						
AHU-X Supply Air Temperature after cooling coil	X						
AHU-X Unit Discharge Air Temperature	X	V					
AHU-X Discharge Air Temperature Command		Х					
AHU-X Return Air Temperature	X		<u> </u>				
AHU-X Space Humidity	X						
AHU-X Return Air Humidity							
AHU-X Space CO2 AHU-X CW Valve Command		v					
AHU-X CW Valve Command AHU-X Supply Air Duct Detector		Х	v				
AHU-X Supply Air Duct Detector			X X				
AHU-X SA Fan Low static pressure alarm			Â				
AHU-X SA Part Low static pressure alarm AHU-X Supply Air Filter static pressure	- I x		^				
AHU-X Status vs Command Alert	Ĉ						
Ano-X otatas vs oonimana Alon							
CONSTANT AIR VOLUME MAKE-UP AIR UNIT				-			
MAU-X SFan S/S				Х			
MAU-X SFan Status			Х				
MAU-X EFan VFD Run Status (Each Fan)							
MAU-X EFan VFD Command Fan Speed (Each Fan)							
MAU-X OSA Damper Command		Х					
MAU-X OSA Damper Position	Х						
MAU-X Supply Air Temperature after heating coil	Х						
MAU-X Supply Air Temperature after cooling coil	X						
MAU-X Unit Discharge Air Temperature	X						
MAU-X Unit Discharge Air Temperature Command		Х					
MAU-X Unit Supply Air Humidity	X	V		<b>—</b>			
MAU-X CW Valve Command		Х	v				
MA-X Supply Air Duct Detector			X				
MAU-X Freeze Temp Detector			X				
MAU-X Low static pressure alarm MAU-X Supply Air Filter static pressure	X		Х				
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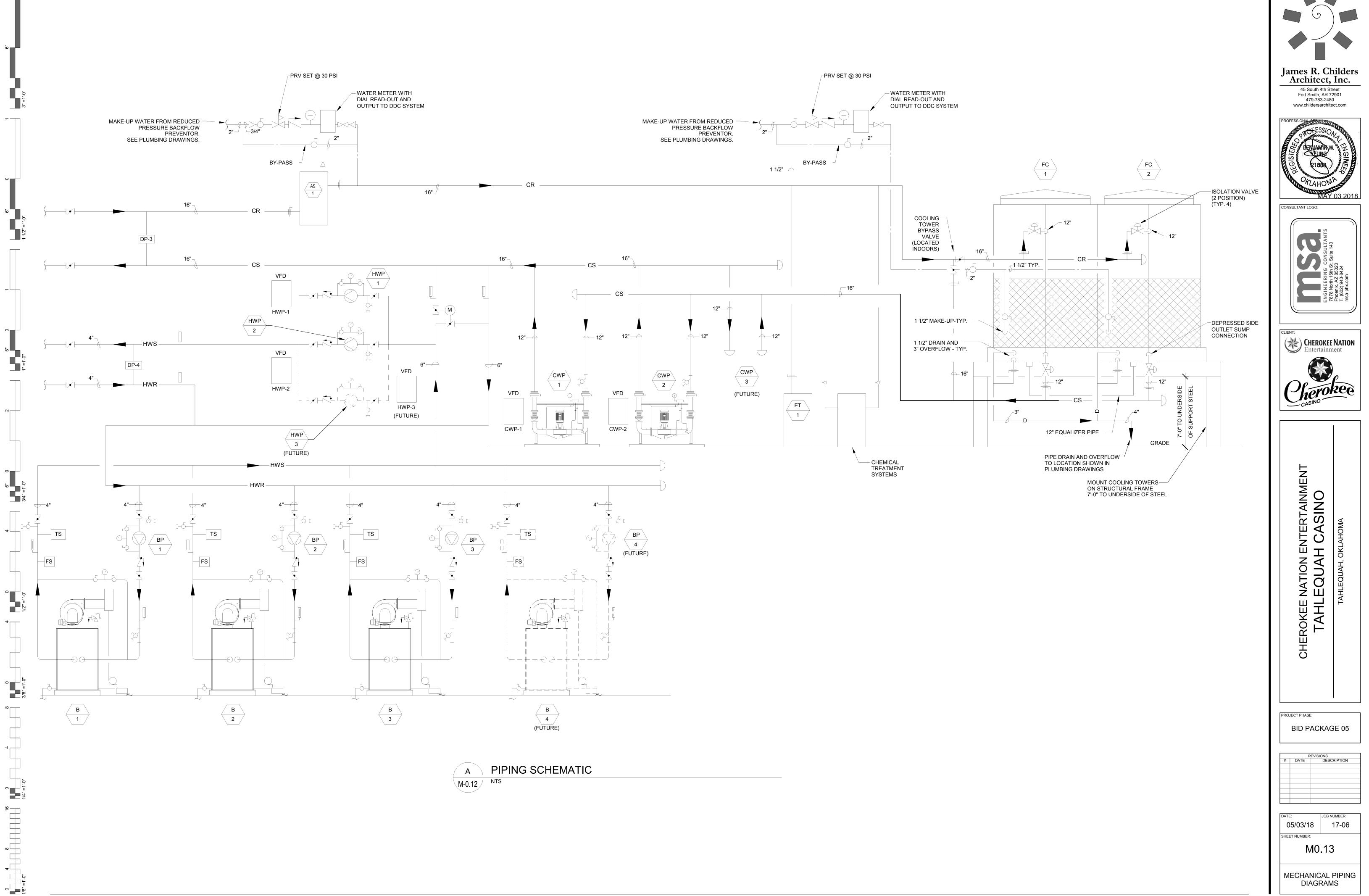
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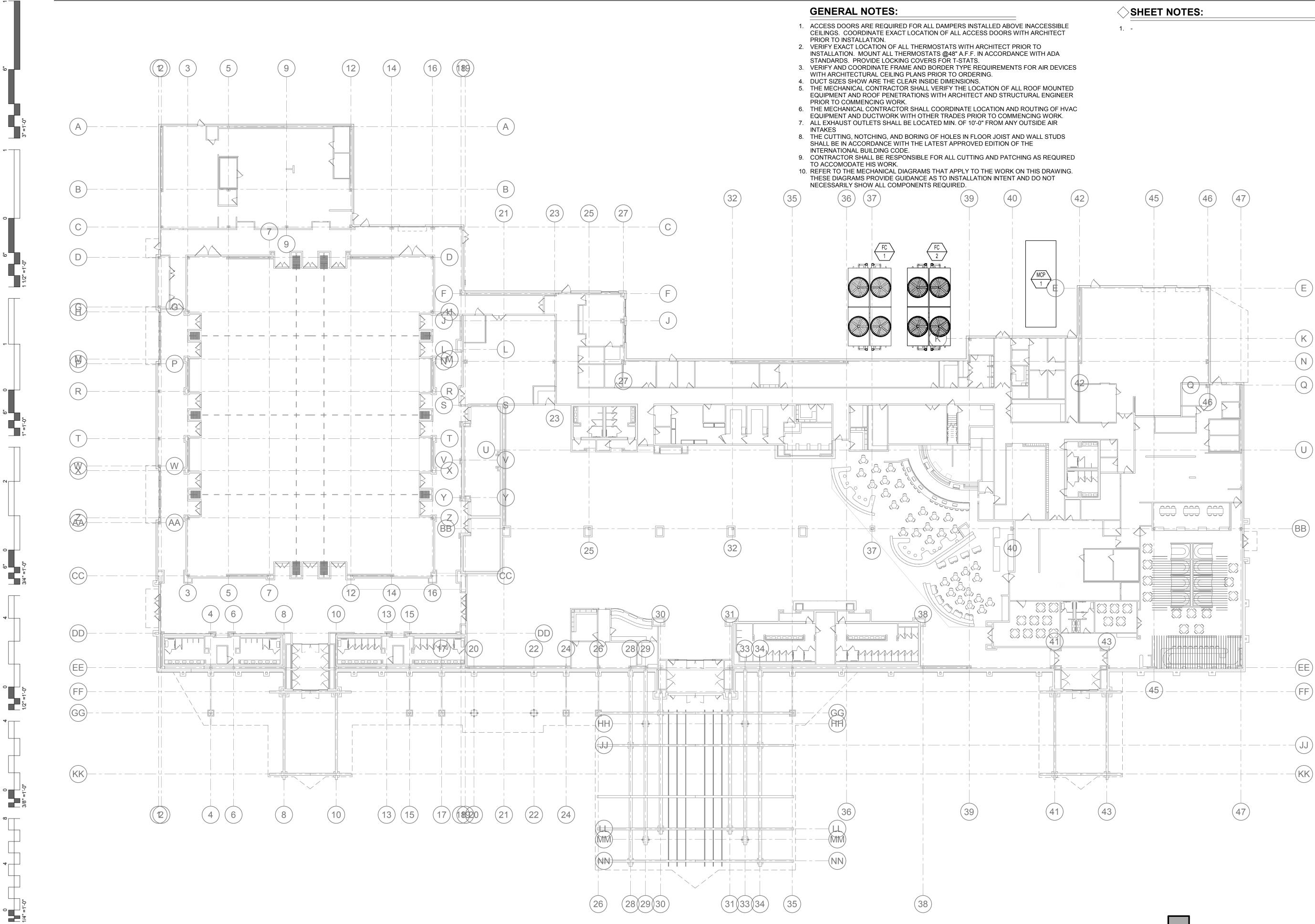
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: TAHLEQUAH CASINO bation: Controls Points List - All points are not necessarily defined here.  ST FAN  St Each Fan)  tatus (Each Fan)  tatus (Each Fan) Motor CT  s Command Alarm  Air Temperature (Two Sensors)  Air Enthalpy  Air Dewpoint  Pres. Trans (Casino Lev)  Pres. Trans (Casino Lev)  Air Casino Lev)  Chore Croper Status (Each Pump CT)  Atter Cric Pump Status (Each Pump CT)  CACTURED PLANT  Smitter 1 - condenser water system Smitter 2 - condenser water system Smitter 3 - heating water system Smitter 4 - heating water system Smitter 4 - heating water system Smitter 4 - heating water system Smitter 5 - heating water system Smitter 5 - heating water system Smitter 1 - heating water system Smitter 1 - heating water system Smitter 2 - condenser water system Smitter 3 - heating water system Smitter 4 - heating water system Smitter 4 - heating water system Smitter 4 - heating water system Smitter 5 - heating water system Smitter 6 - heating water system Smitter 7 - heating water system Smitter 8 - heating water system Smitter 9 - heating water system Smitter 9 - heating water system Smitter 1 - heating water system Smitter 1 - heating water system Smitter 1 - heating water system Smitter 2 - condenser water pump rotation sequence Smitter 6 - heating sequence Smitter 7 - heater rotation sequence Smitter 7 - heater rotation sequence Smitter 7 - heater rotation sequenc	AI		ТҮРЕ	-		- 1		
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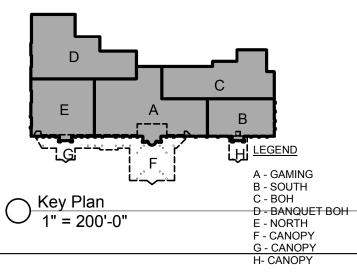
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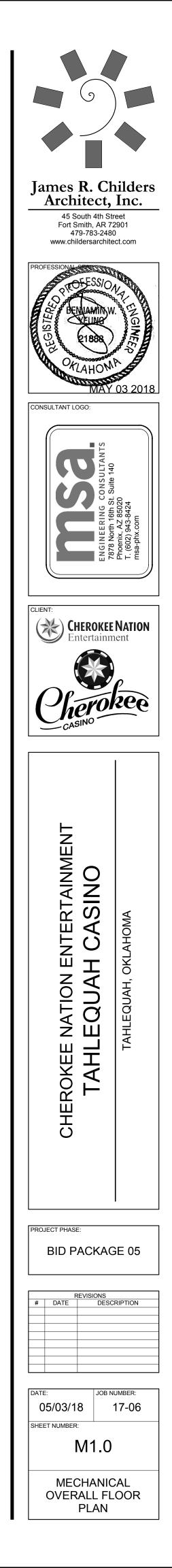
James R. Cl Architect, 45 South 4th St Fort Smith, AR 7 479-783-248 www.childersarchite	Inc. rreet 2901 0
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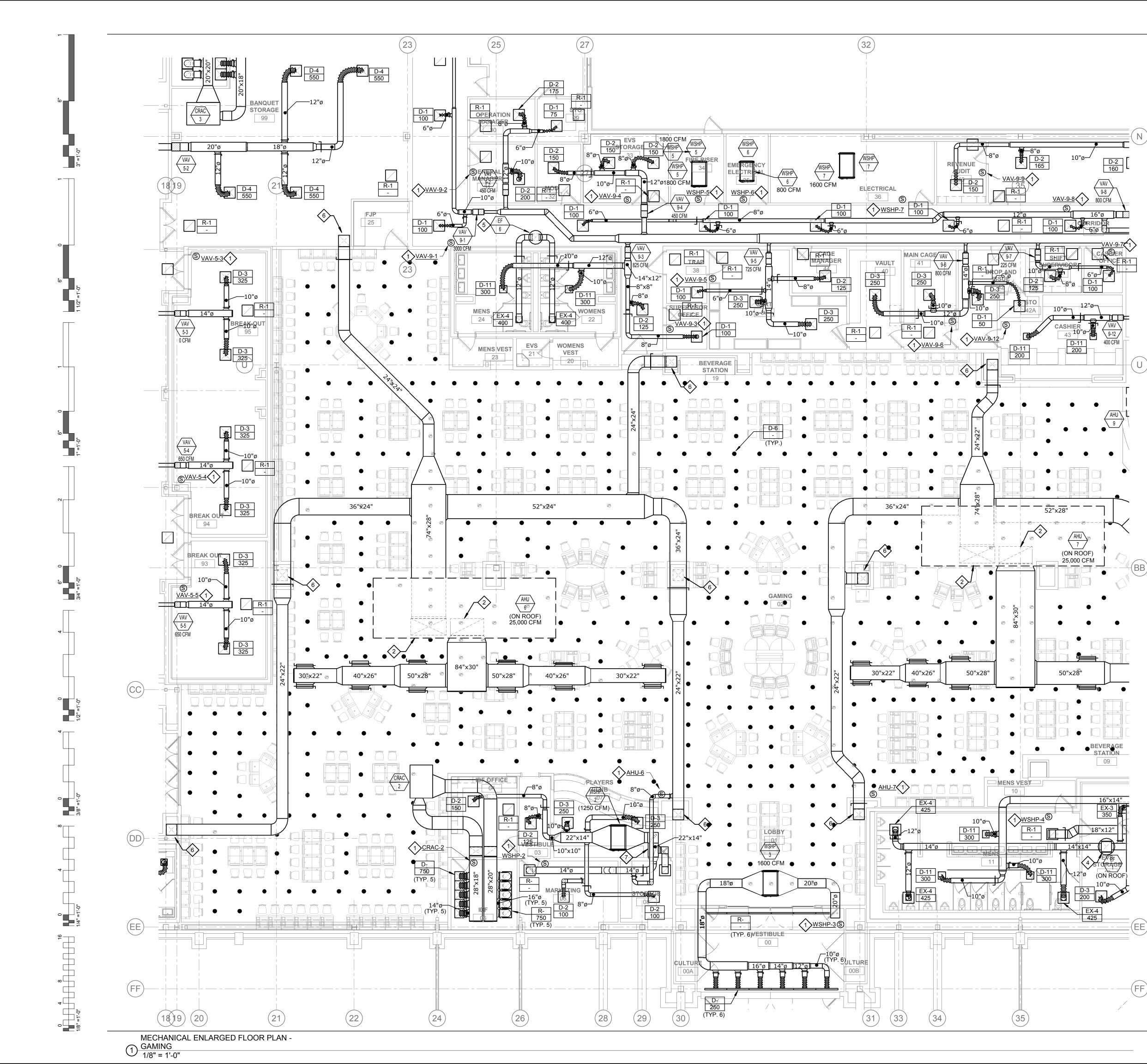




 $1 \frac{\text{MECHANICAL OVERALL FLOOR PLAN}}{3/64" = 1'-0"}$ 







- 1. ACCESS DOORS ARE REQUIRED FOR ALL DAMPERS INSTALLED ABOVE INACCESSIBLE CEILINGS. COORDINATE EXACT LOCATION OF ALL ACCESS DOORS WITH ARCHITECT PRIOR TO INSTALLATION.
- 2. VERIFY EXACT LOCATION OF ALL THERMOSTATS WITH ARCHITECT PRIOR TO INSTALLATION. MOUNT ALL THERMOSTATS @48" A.F.F. IN ACCORDANCE WITH ADA STANDARDS. PROVIDE LOCKING COVERS FOR T-STATS.
- 3. VERIFY AND COORDINATE FRAME AND BORDER TYPE REQUIREMENTS FOR AIR DEVICES WITH ARCHITECTURAL CEILING PLANS PRIOR TO ORDERING.
- DUCT SIZES SHOW ARE THE CLEAR INSIDE DIMENSIONS.
   THE MECHANICAL CONTRACTOR SHALL VERIFY THE LOCATION OF ALL ROOF MOUNTED EQUIPMENT AND ROOF PENETRATIONS WITH ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO COMMENCING WORK.
- THE MECHANICAL CONTRACTOR SHALL COORDINATE LOCATION AND ROUTING OF HVAC EQUIPMENT AND DUCTWORK WITH OTHER TRADES PRIOR TO COMMENCING WORK.
- 7. ALL EXHAUST OUTLETS SHALL BE LOCATED MIN. OF 10'-0" FROM ANY OUTSIDE AIR INTAKES
   8. THE CULTTING MOTCHING AND BODING OF HOLES IN ELOOP JOIST AND WALL STUDY
- THE CUTTING, NOTCHING, AND BORING OF HOLES IN FLOOR JOIST AND WALL STUDS SHALL BE IN ACCORDANCE WITH THE LATEST APPROVED EDITION OF THE INTERNATIONAL BUILDING CODE.
   CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING AS
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COTTING AND PATCHING AS REQUIRED TO ACCOMODATE HIS WORK.
   REFER TO THE MECHANICAL DIAGRAMS THAT APPLY TO THE WORK ON THIS DRAWING. THESE DIAGRAMS PROVIDE GUIDANCE AS TO INSTALLATION INTENT AND DO NOT NECESSARILY SHOW ALL COMPONENTS REQUIRED.

## SHEET NOTES:

- 1. PROVIDE SENSOR AND WIRING UP TO AIR HANDLING UNIT, WATER SOURCE HEAT PUMP UNIT, AND/OR VAV BOX AS INDICATED.
- 2. 74"X28" SUPPLY AIR, 84"X30" RETURN AIR UP TO AHU-6 AND AHU-7.
- 3. 26"X20" SUPPLY AIR, 32"X26" RETURN AIR UP TO AHU-9.
- 4. 24"X22" EXHAUST AIR UP TO <u>EF-1</u>.
- 5. 14"X14" EXHAUST AIR UP TO <u>EF-6</u>.
- 6. 24"X22" SUPPLY AIR DUCT DOWN TO RAISED FLOOR. TERMINATE 12" ABOVE FINISHED FLOOR.
- 7. 8"Ø OUTSIDE AIR DUCT (200 CFM).
- 8. 10"Ø OUTSIDE AIR DUCT (300 CFM).



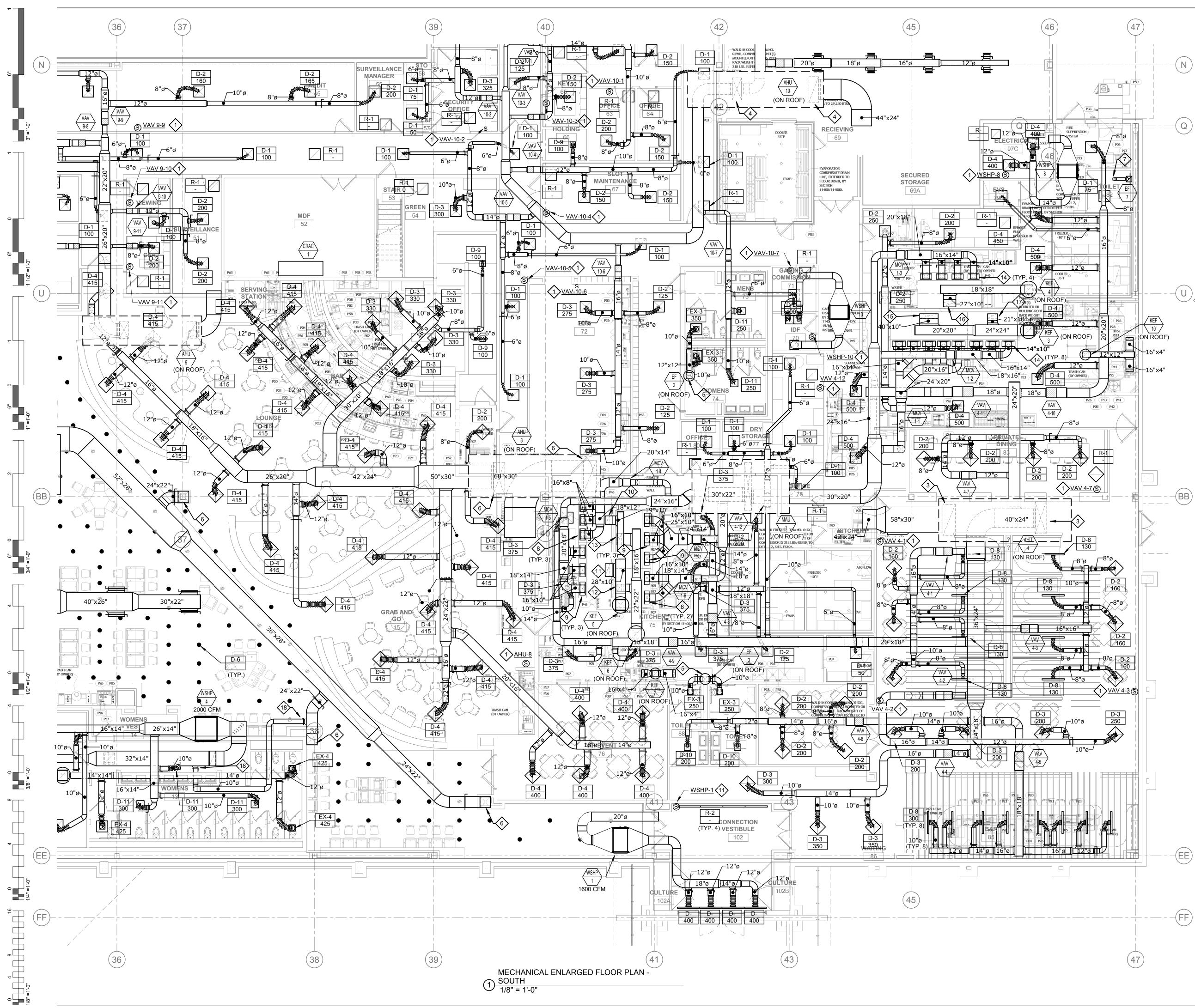






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1. ACCESS DOORS ARE REQUIRED FOR ALL DAMPERS INSTALLED ABOVE INACCESSIBLE CEILINGS. COORDINATE EXACT LOCATION OF ALL ACCESS DOORS WITH ARCHITECT PRIOR TO INSTALLATION.

- VERIFY EXACT LOCATION OF ALL THERMOSTATS WITH ARCHITECT PRIOR TO INSTALLATION. MOUNT ALL THERMOSTATS @48" A.F.F. IN ACCORDANCE WITH ADA STANDARDS. PROVIDE LOCKING COVERS FOR T-STATS.
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- ENGINEER PRIOR TO COMMENCING WORK.
  6. THE MECHANICAL CONTRACTOR SHALL COORDINATE LOCATION AND ROUTING OF HVAC EQUIPMENT AND DUCTWORK WITH OTHER TRADES PRIOR TO COMMENCING
- WORK. 7. ALL EXHAUST OUTLETS SHALL BE LOCATED MIN. OF 10'-0" FROM ANY OUTSIDE AIR INTAKES
- 8. THE CUTTING, NOTCHING, AND BORING OF HOLES IN FLOOR JOIST AND WALL STUDS SHALL BE IN ACCORDANCE WITH THE LATEST APPROVED EDITION OF THE INTERNATIONAL BUILDING CODE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING AS REQUIRED TO ACCOMODATE HIS WORK.
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### SHEET NOTES:

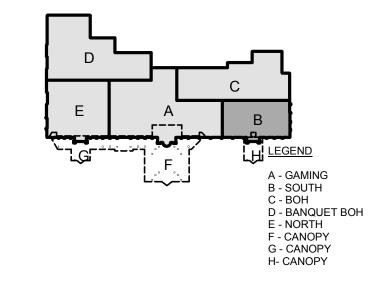
- 1. PROVIDE SENSOR AND WIRING UP TO AIR HANDLING UNIT, WATER SOURCE HEAT PUMP UNIT, AND/OR VAV BOX AS INDICATED.
- 2. --"X--" SUPPLY AIR, --"X--" RETURN AIR UP TO <u>AHU-8</u>.
- 3. --"X--" SUPPLY AIR, --"X--" RETURN AIR UP TO <u>AHU-4</u>.
- 4. --"X--" SUPPLY AIR, --"X--" RETURN AIR UP TO AHU-10.
- 5. 12"X12" EXHAUST AIR UP TO EF-2 AND EF-3.

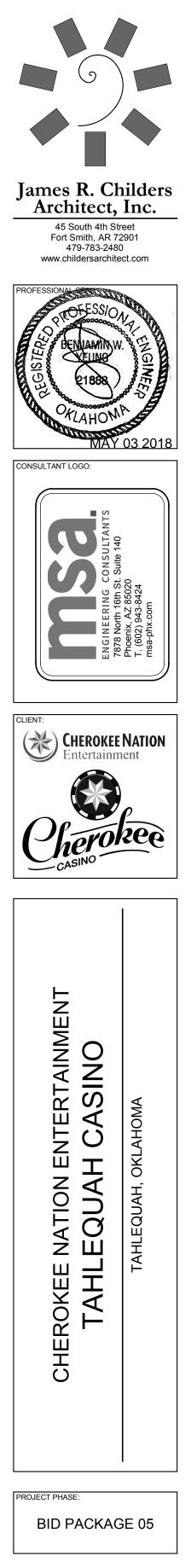
 24"X22" SUPPLY AIR DUCT DOWN TO RAISED FLOOR.
 TERMINATE 12" ABOVE FINISHED FLOOR.

- 7. 8"Ø EXHAUST UP THROUGH ROOF WITH APPROVED AIR CAP.
- 8. 16"X8" MAKE-UP AIR DOWN TO HOOD.
- 9. 16"X10" MAKE-UP AIR DOWN TO HOOD.
- 10. 19"X10" GREASE EXHAUST DOWN TO HOOD.
- 11. 28"X10" GREASE EXHAUST DOWN TO HOOD.
- 12. 16"X10" GREASE EXHAUST DOWN TO HOOD.

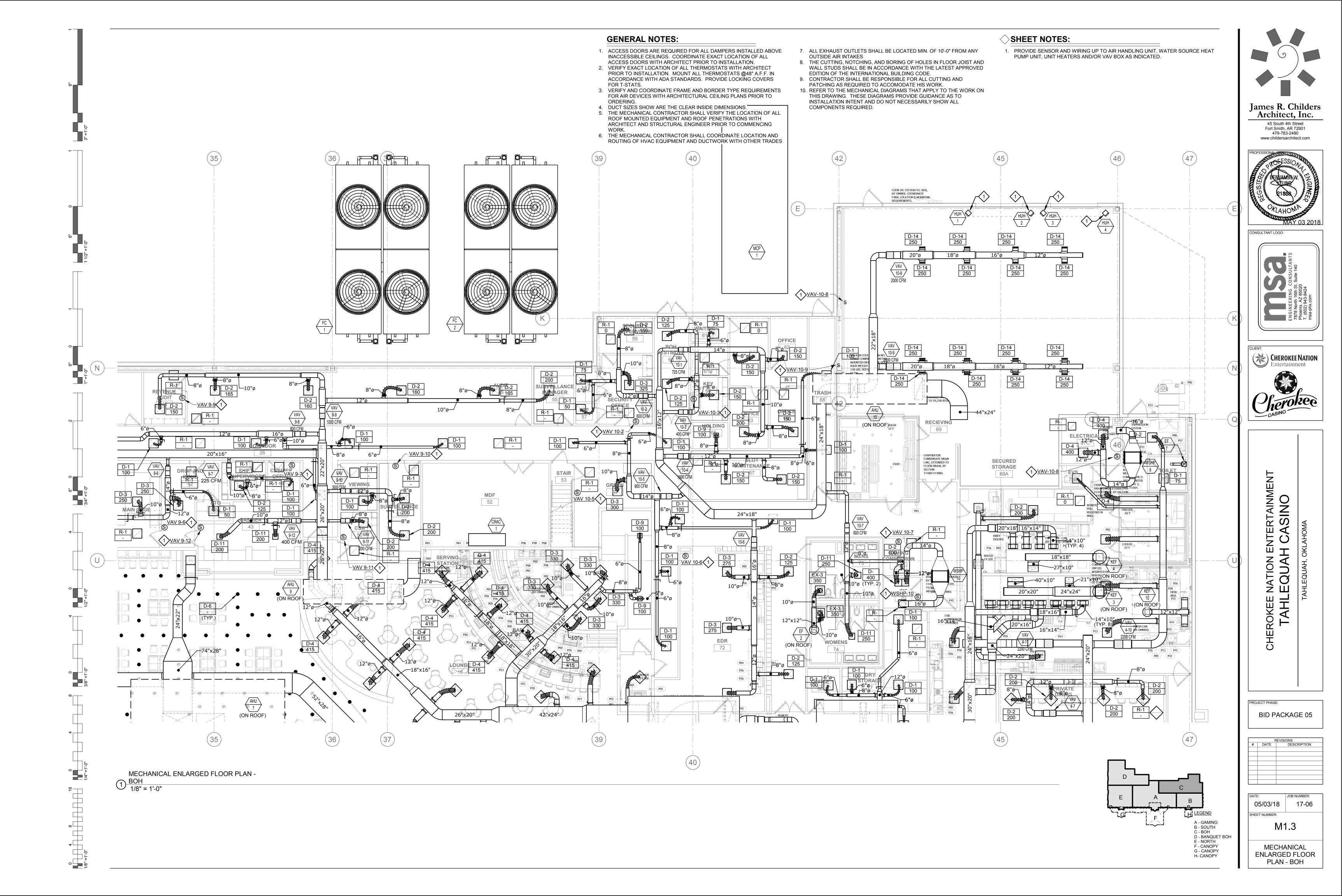
13. 25"X10" GREASE EXHAUST DOWN TO HOOD.
 14. 14"X10" MAKE-UP AIR DOWN TO HOOD.

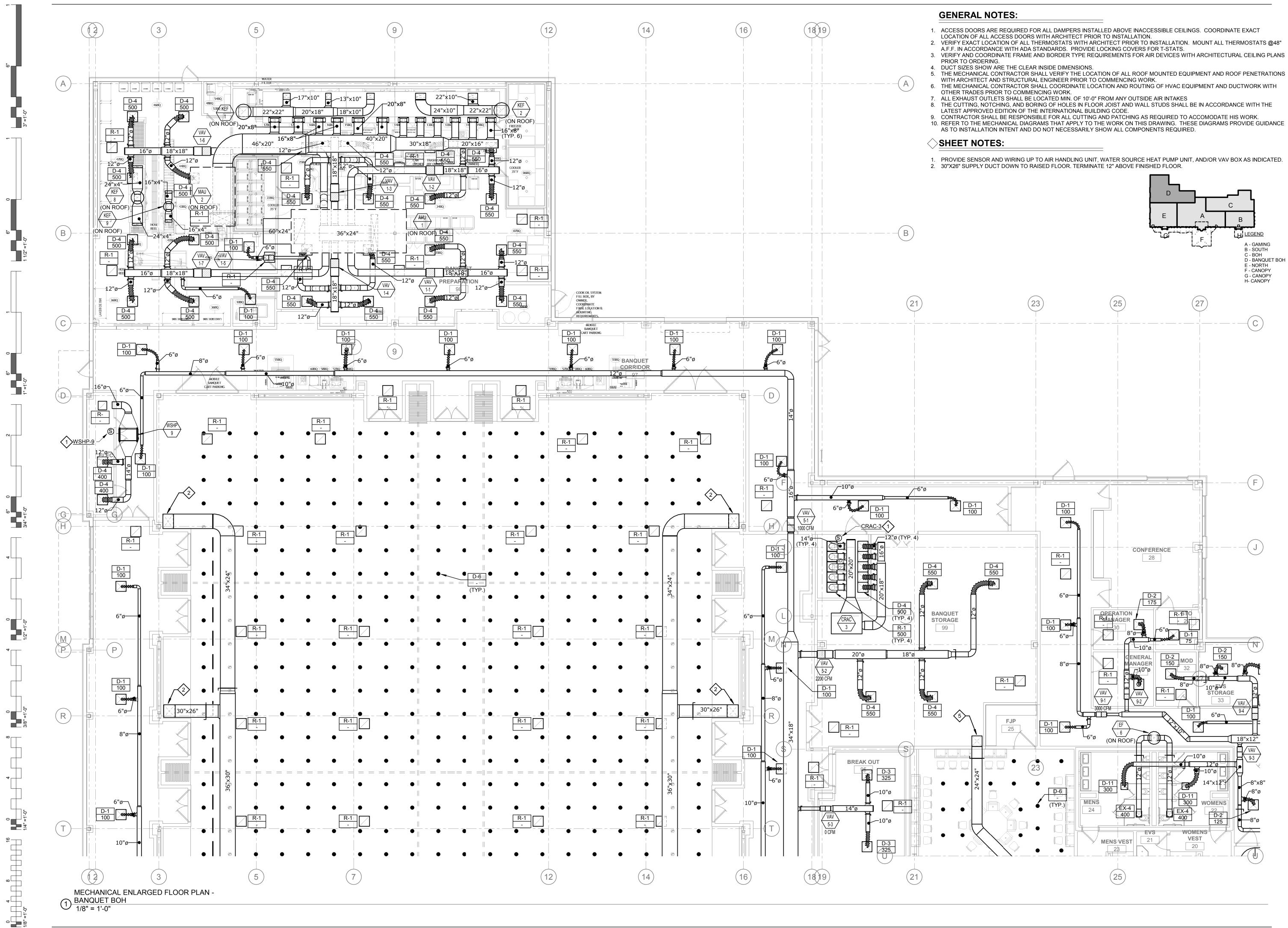
- 15. 40"X10" GREASE EXHAUST DUCT DOWN TO HOOD.
- 16. 27"X10" GREASE EXHAUST DUCT DOWN TO HOOD.
- 17. 21"X10" GREASE EXHAUST DUCT DOWN TO HOOD.
- 18. 10"Ø OUTSIDE AIR DUCT.

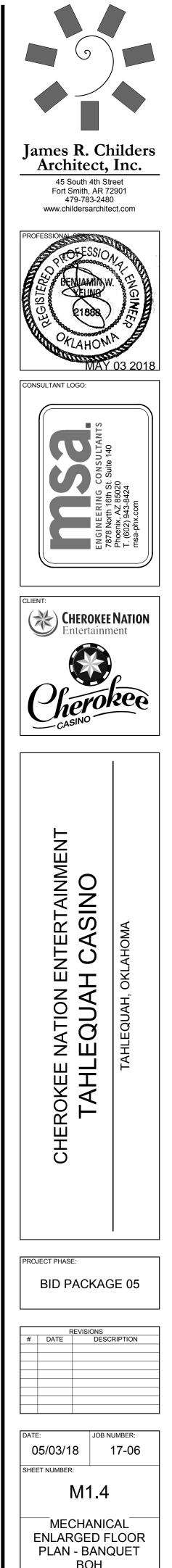


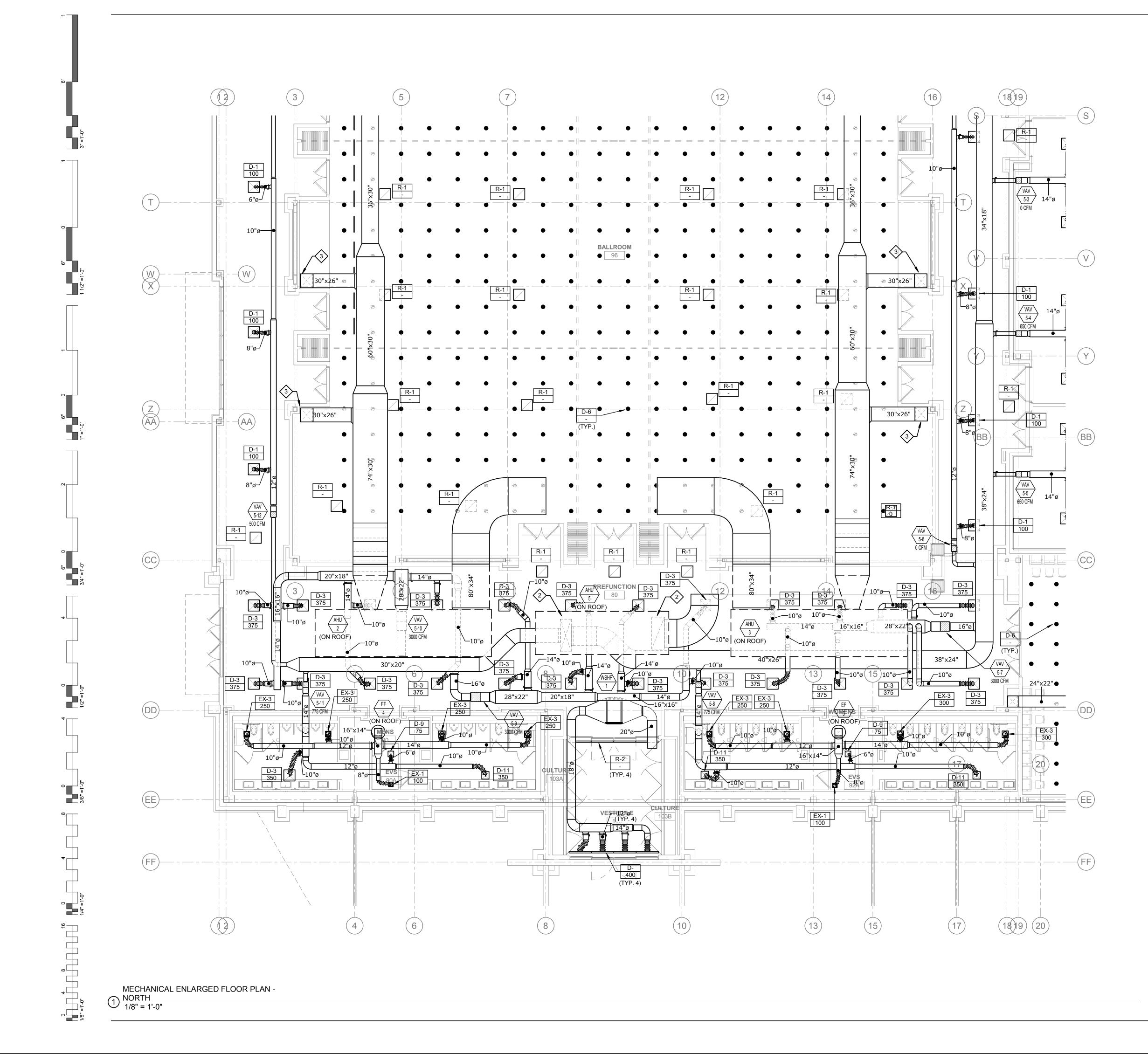


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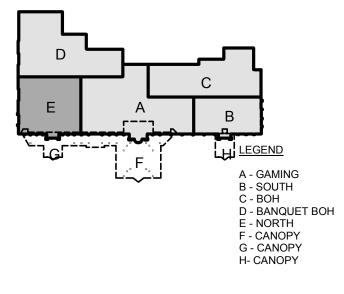
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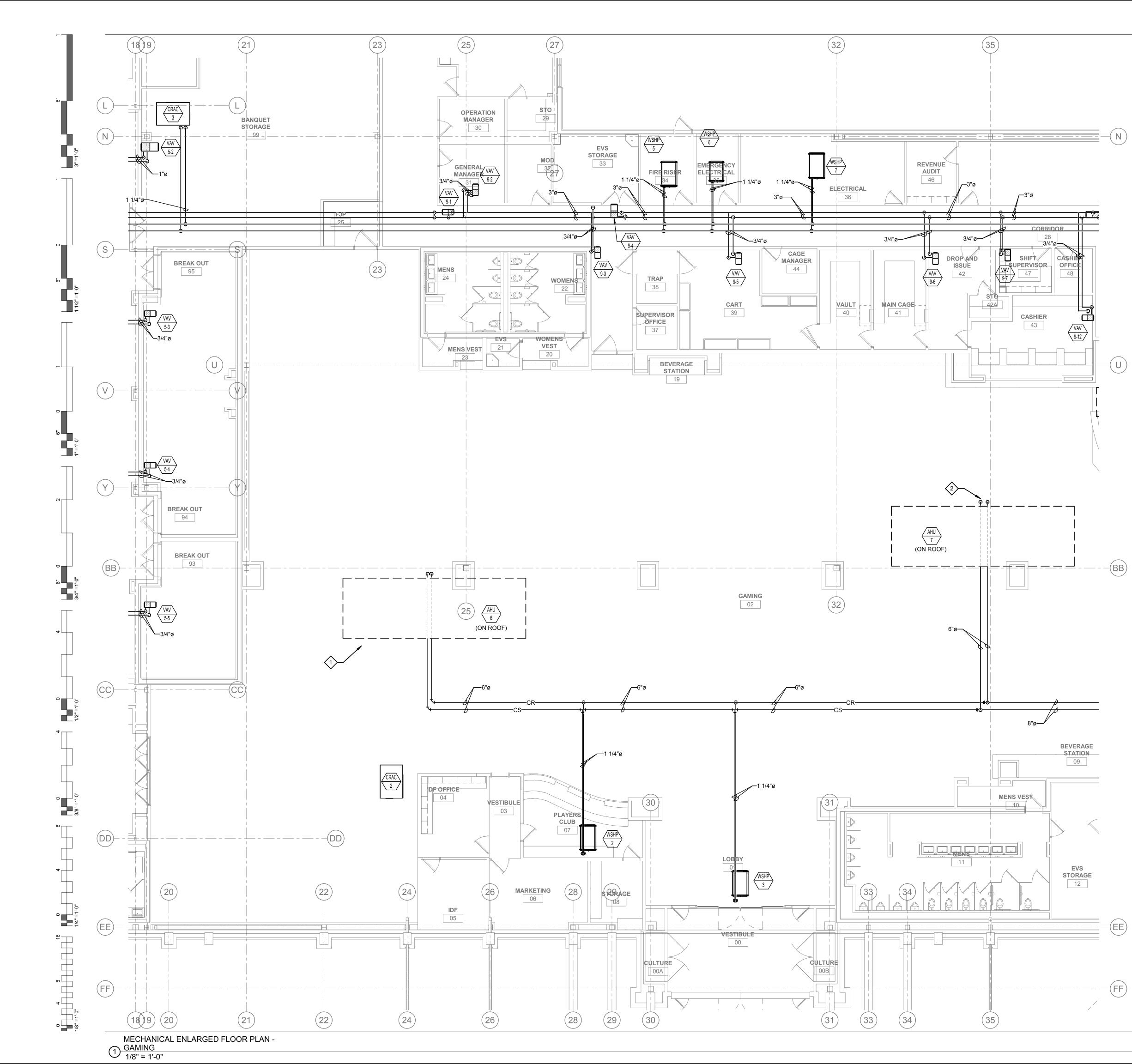
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- PROVIDE SENSOR AND WIRING UP TO AIR HANDLING UNIT, WATER SOURCE HEAT PUMP UNIT, AND/OR VAV BOX AS INDICATED.
   52"X30" SUPPLY AIR DUCT. 60"X30" RETURN AIR DUCT UP TO AHUL3
- 52"X30" SUPPLY AIR DUCT, 60"X30" RETURN AIR DUCT UP TO <u>AHU-3</u>.
   30"X26" SUPPLY AIR DUCT DOWN TO RAISED FLOOR. TERMINATE 12" ABOVE FINISHED FLOOR.
- ALL EXTERIOR DUCTWORK SHALL HAVE 2" INSULATION WITH JACKETING.
   24"X24" SUPPLY AIR DUCT DOWN TO RAISED FLOOR. TERMINATE 12" ABOVE FINISHED FLOOR.



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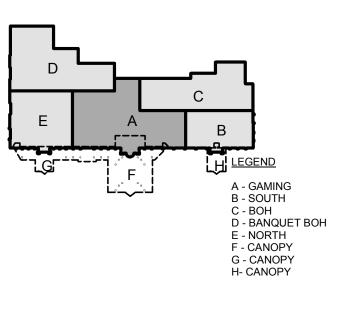




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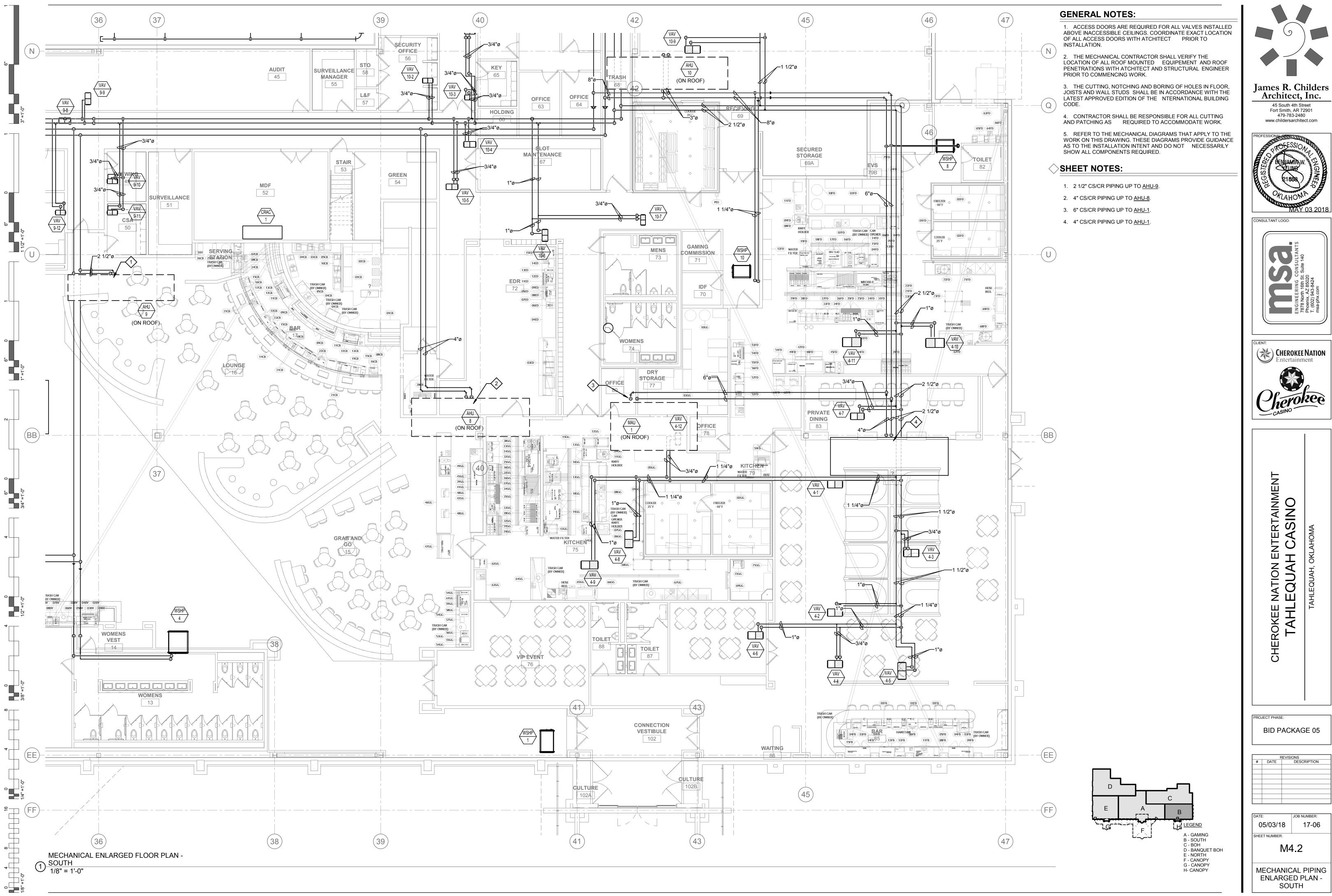
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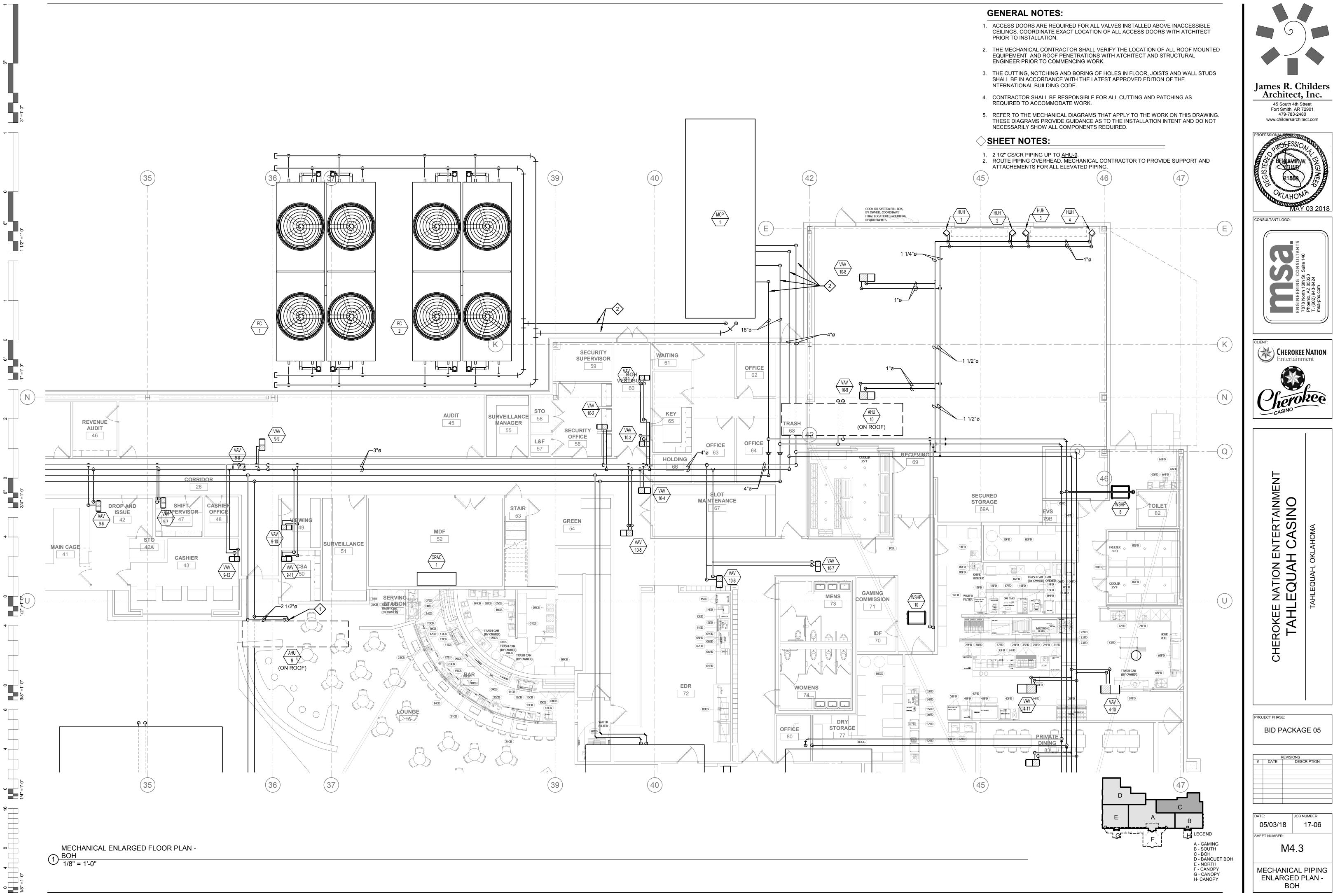
- 1. 6" CS/CR PIPING UP TO AHU-6.
- 2. 6" CS/CR PIPING UP TO AHU-7.
- 3. 2 1/2" CS/CR PIPING UP TO AHU-9.

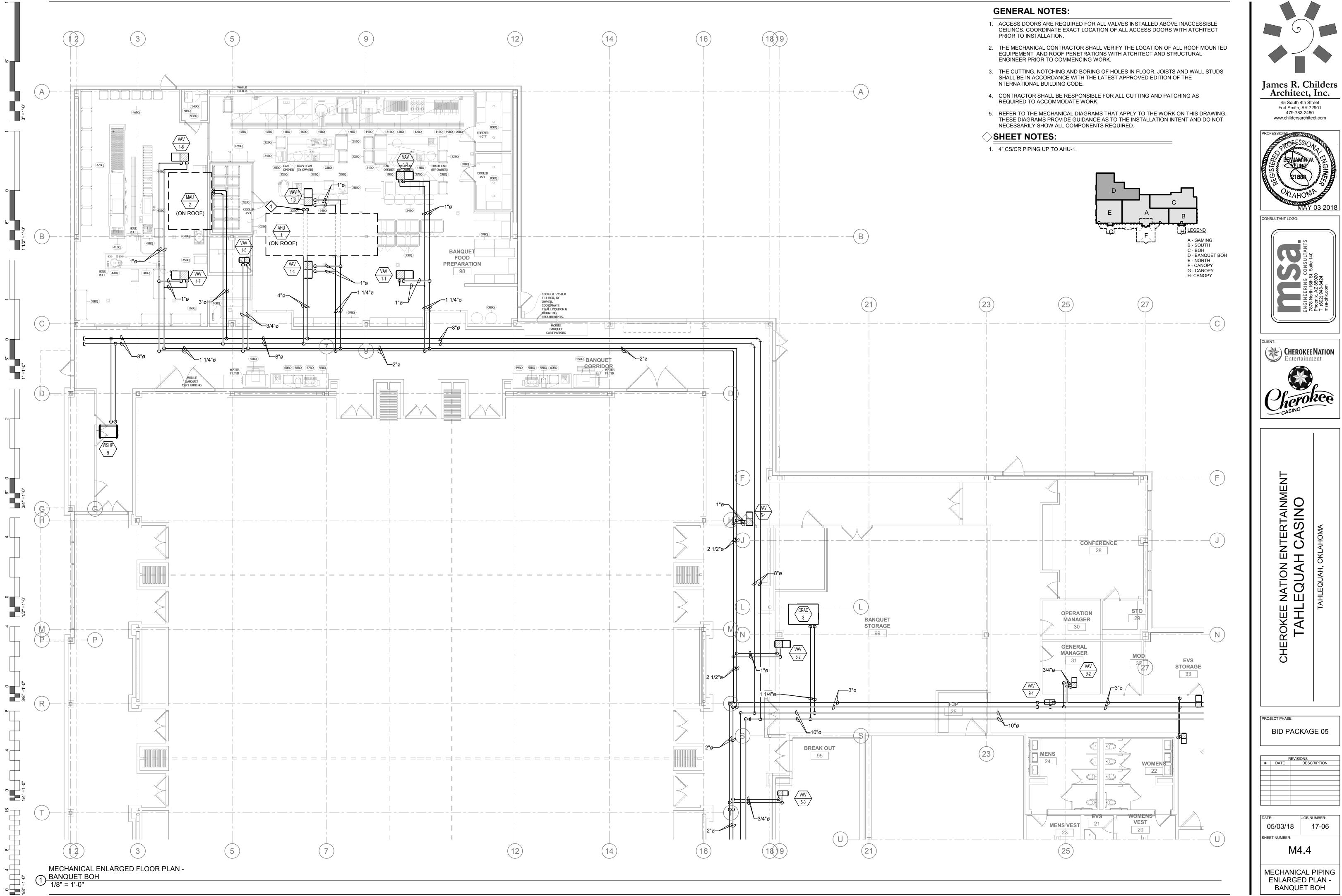


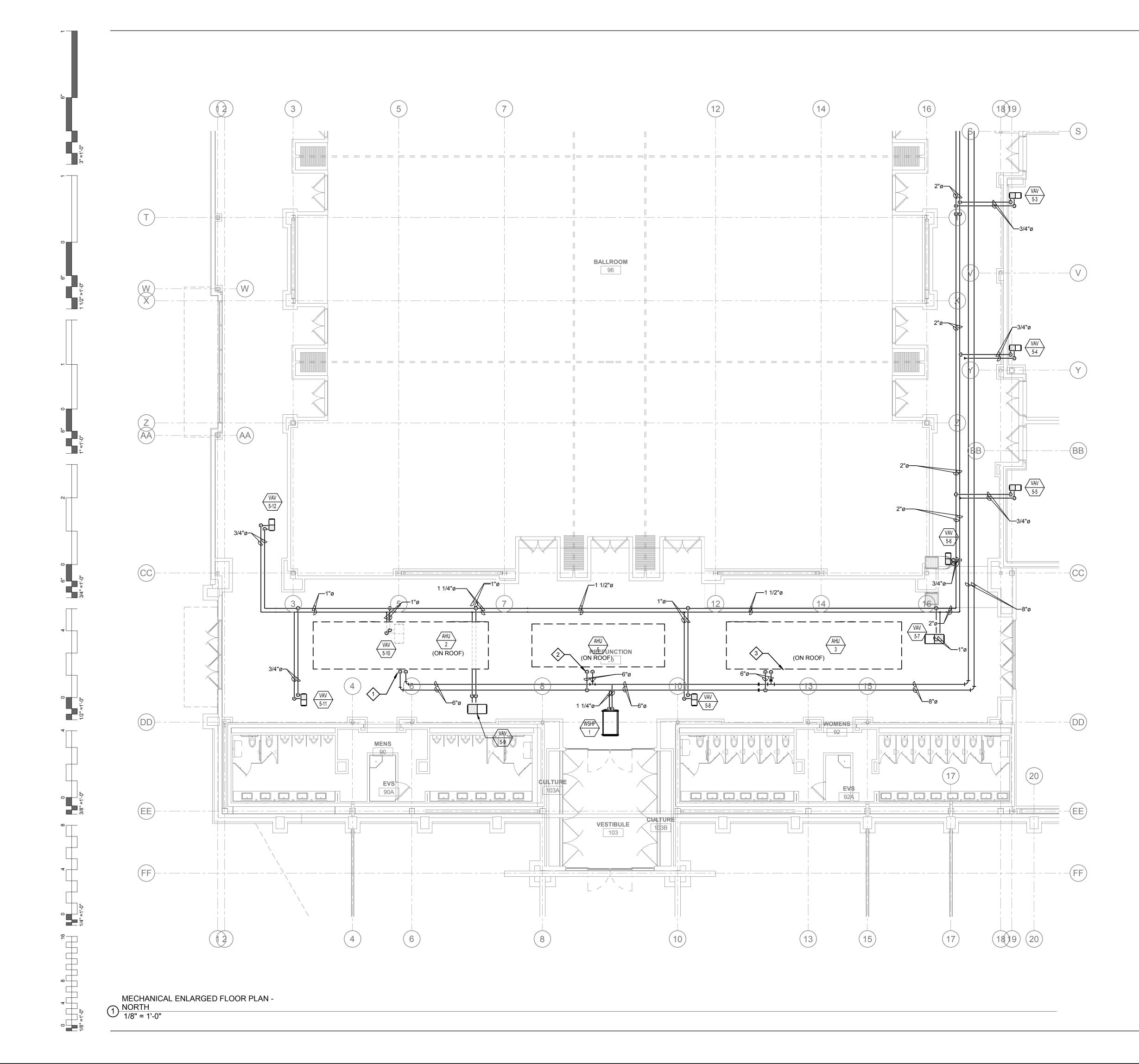
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MECHANICAL PIPING ENLARGED FLOOR PLAN - GAMING





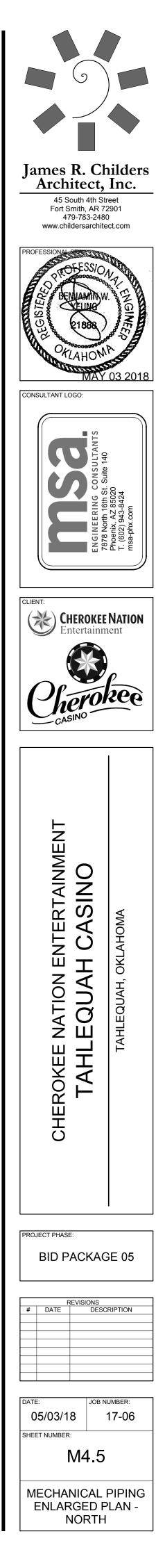


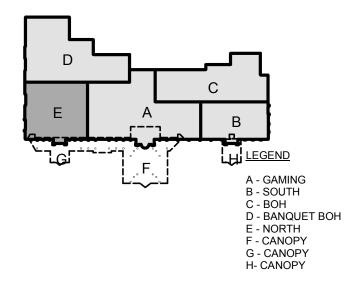


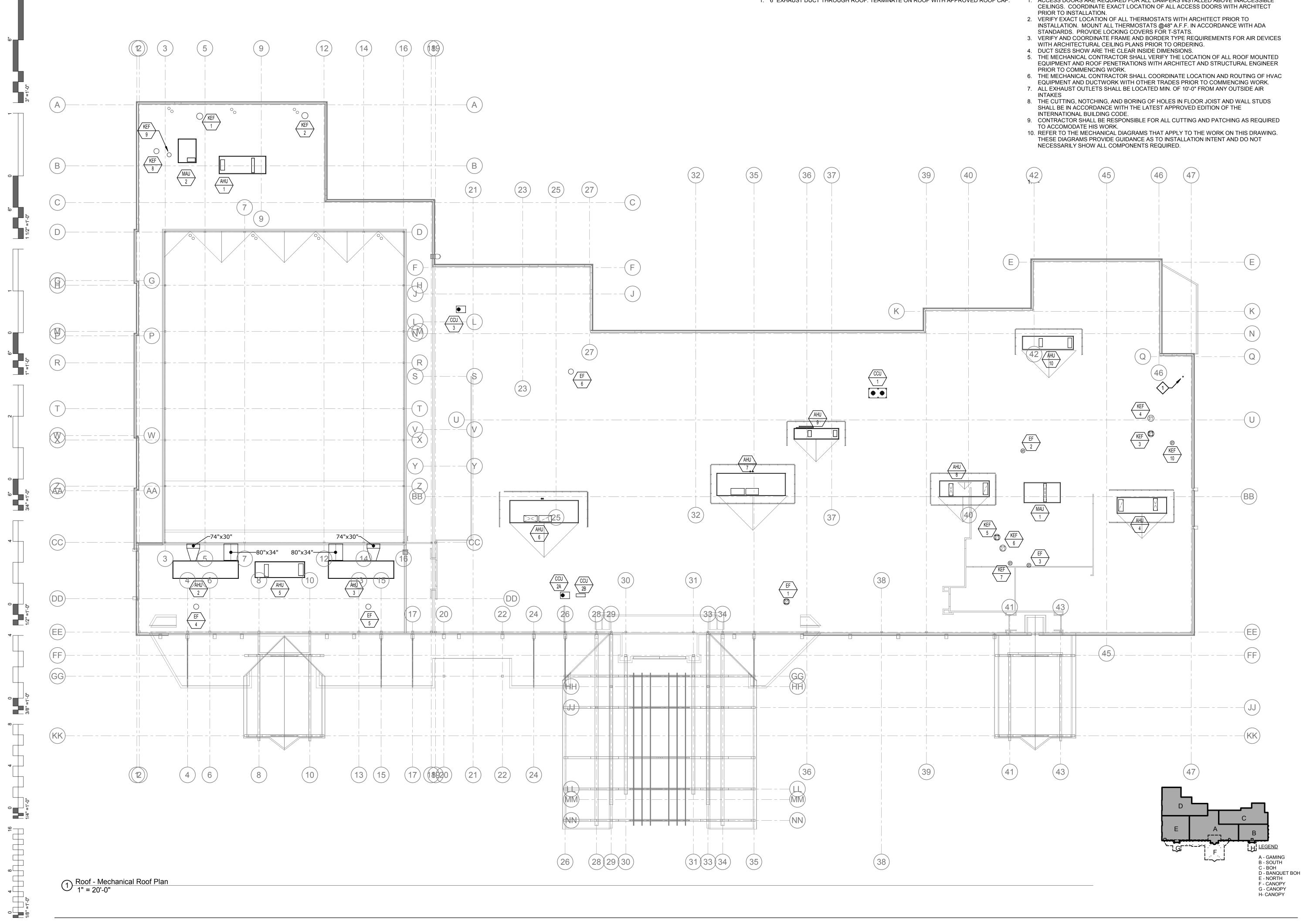
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## ♦ SHEET NOTES:

- 1. 6" CS/CR PIPING UP TO <u>AHU-2</u>.
- 2. 4" CS/CR PIPING UP TO <u>AHU-5</u>.
- 3. 6" CS/CR PIPING UP TO AHU-3.







## SHEET NOTES:

1. 6" EXHAUST DUCT THROUGH ROOF. TERMINATE ON ROOF WITH APPROVED ROOF CAP.

### **GENERAL NOTES:**

1. ACCESS DOORS ARE REQUIRED FOR ALL DAMPERS INSTALLED ABOVE INACCESSIBLE CEILINGS. COORDINATE EXACT LOCATION OF ALL ACCESS DOORS WITH ARCHITECT

- 3. VERIFY AND COORDINATE FRAME AND BORDER TYPE REQUIREMENTS FOR AIR DEVICES

- EQUIPMENT AND DUCTWORK WITH OTHER TRADES PRIOR TO COMMENCING WORK.
- 10. REFER TO THE MECHANICAL DIAGRAMS THAT APPLY TO THE WORK ON THIS DRAWING.

