PLUMBI
 PLUMIEN A. AL YON SHALL CONTROL TO THE ARTER TOTIONS OF THE INTERNATIONAL CODE AND ALL LOCAL DRIVANCES AS AL YON YON YON THE CONTROL THE STATE TOTIONS OF THE INTERNATIONAL CODE AND ALL LOCAL DRIVANCES AS D. PELEVANCES ARE IN MRY COMPANYING THE CONTROL TOWN OF THE CONTROL TOWNING TAKIN P MRY PERFORMANCE D. PELEVANCES ARE IN MRY COMPANYING THE CONTROL TOWN OF THE ARMY SHOW ALL RECESSAME METRICS AND EXPERIMENT D. PELEVANCES ARE IN MRY COMPANYING THE CONTROL TOWN OF THE ARMY SHOW ALL RECESSAME METRICS AND EXPERIMENT D. PELEVANCES ARE IN MRY COMPANYING THE CONTROL TOWN OF THE ARMY SHOW ALL RECESSAME METRICS D. PELEVANCES ARE IN MRY COMPANYING THE ALL RECENT AND INSERTITIONS AND SHALL RAY ALL ASSOCIATED TEST FRE D. RECENTLY ON THE CONTROL TO ALL ADVANCES AND INSERTITIONS AND SHALL RAY ALL ASSOCIATED TEST FRE D. RECENTLY ON THE ALL ADVANCES AND INSERTITION OF THE ARMY SHOW ALL RECESSAME METRICS D. RECENTLY ON THE ALL ADVANCES AND INSERTITION OF THE ARMY SHOW ALL ASSOCIATED TEST FRE D. RECENTLY ON THE ALL ADVANCES AND INSERTITION OF THE ARMY SHOW ALL ASSOCIATED TEST FRE D. RECENTLY ON THE ALL ADVANCES AND INSERTION OF THE ARMY SHOW ALL ASSOCIATED TEST FRE D. RECENTLY ON THE ALL ADVANCES AND INSERTION OF THE ARMY SHOW ALL ADVANCES AND INSERTION OF THE ARMY ALL ADVANCES AND INFORMATION OF THE ARMY ALL ADVANCES AND INSERTION OF THE ARMY ALL ADVANCES AND INTERNACE D. RECENTLY ON THE ARMY ALL ADVANCES AND INSERTION OF THE ARMY ALL ADVANCES AND INTERNACE D. RECENTLY ON THE ARMY ALL ADVANCES AND INSERTION OF THE ARMY ALL ADVANCES AND INTERNACE D. ALL ADVANCE AND ADVANCE AND INFORMATION AND INFO

ED DRAIN AND WASTE PIPING IN ADA INSTALLATIONS SHALL BE COVERED WITH ADA IANT MOLDED VINYL JACKET COVERS PRECISELY FITTED TO INSTALLED PIPING.

ALL PIPING 2" OR SMALLER SHALL BE ZURNPEX STICKS WITH ZURN EXPANSION FITTINGS OR AL. ALL PIPING 2–1/2" OR LARGER SHALL BE SCHEDULE 40 CPVC WITH CPVC FITTINGS CEMENT JOINTS. ALL PEX PIPING SHALL BE INSTALLED WITH GALVANIZED PIPE SUPPORTS ONOR PEX–A PIPE SUPPORTS. INSIDE STRUCTURE-SCHEDULE 40 CPVC WITH CPVC FITTINGS AND SOLVENT CEMENT JOINTS. LL EXTEND THROUGH THE BUILDING SLAB IF PRESENT.

OUTSIDE STRUCTURE-SCHEDULE 40 PVC WITH PVC FITTINGS AND SOLVENT CEMENT JOINTS.

ER: INSULATE ALL PIPING ABOVE SLAB OR GRADE (INCLUDING TRAP PRIMERS) WITH 1/2" ERGLASS WITH VAPOR SEAL. ALL PIPING IN PLENUM AREAS SHALL BE INSULATED WITH I WITH A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE—DEVELOPED INDEX ORE THAN 50

: INSULATE ALL PIPING 1-1/4" OR SMALLER WITH 1" THICK FIBERGLASS. INSULATE ALL 1/2" OR LARGER WITH 1-1/2" THICK FIBERGLASS. PIPE AND FITTING INSULATION IN FINISHED AREAS SHALL BE JACKETED WITH FACTORY PVC INSULATION JACKETING. SUBMIT COLORS FOR APPROVAL.

R SUPPLIES SHALL BE EQUIPPED WITH ANTI-SCALD/TEMPERING DEVICES CONFORMING TO VATORY AND HAND WASH DEVICES SHALL LIMIT THE TEMPERATURE TO NO MORE THAN 110F. ATER SHALL BE SET TO NO MORE THAN 120F. HAMMER ARRESTORS FOR HOT AND COLD WATER SUPPLY AT ALL HARD SHUTOFF DEVICES NKS, DRINKING FOUNTAINS, DISHWASHERS, CLOTHES WASHERS, ETC.).

SHALL BE INSTALLED AT ALL DIS-SIMILAR METAL CONNECTIONS. DIS-SIMILAR HANGER TO RUCTURE, OR PIPE TO STRUCTURE CONTACT SHALL BE ISOLATED. THIS INCLUDES BUT IS FOLLOWING:

AND VENT

EXCEPT THOSE AT THE UPPERMOST 10 FT OF THE SYSTEM. TER TO MAINTAIN NO LESS THAN 10 FT HEAD ON ALL JOINTS AND PIPES BELOW THE F THE SYSTEM. MAINTAIN PRESSURE FOR 12 HOURS. E OCCURS, LOCATE AND REPAIR LEAKS AND REPEAT TEST PROCEDURE.

SYSTEM TO BE TESTED WITH SHUTOFF VALVES AND/OR CAPS. R (FOR PIPE OTHER THAN PLASTIC) OR WATER (FOR PLASTIC PIPE) TO A PRESSURE OF 100 JRE FOR 12 HOURS.

BE TREATED IS BETWEEN 7.4 AND 7.6 BY ADDING ALKALI (CAUSTIC SODA OR SODA ASH) E CHLORINE IN LIQUID, POWDER, TABLET OR GAS FORM) THROUGHOUT SYSTEM TO OBTAIN

ETS TO ENSURE DISTRIBUTION AND TEST FOR DISINFECTANT RESIDUAL AT MINIMUM 15

ESIDUAL. IF FINAL DISINFECTANT RESIDUAL TESTS LESS THAN 25 MG/L, REPEAT TREATMENT. SYSTEM UNTIL RESIDUAL IS EQUAL TO THAT OF INCOMING WATER OR 1.0 MG/L. R THAN 24 HOURS AFTER FLUSHING FROM 10 PERCENT OF OUTLETS AND FROM WATER RANCE WITH AWWA C651. REPEAT ENTIRE PROCEDURE IF CONTAMINATION REMAINS. ND PROVIDE TO OWNER. INSPECTION BY LOCAL AUTHORITY MAY BE REQUIRED.

IN ACCORDANCE WITH ASTM STANDARD A13.1. LABELS SHALL INCLUDE PIPING SERVICE WATER RETURN, VENT, ETC.), SIZE, AND DIRECTION OF FLOW.

AREAS SERVED BY A FLOOR DRAIN SHALL BE SLOPED A MINIMUM OF 1/16" PER FOOT IR DRAIN. THE SLOPE SHALL BE CONTINUOUS AND CONSISTENT FOR THE ENTIRE AREA ALLS UNLESS OTHERWISE INDICATED IN THE ARCHITECTURAL OR FOUNDATION PLANS. THE RAINER SHALL BE THE LOWEST POINT IN THE SLOPED AREA, SHALL BE INSTALLED LEVEL, ISH WITH THE SURROUNDING FINISHED FLOOR. COORDINATE WITH GC.

D WALL, FLOOR, CEILING, AND ROOF PENETRATION LOCATIONS AND SIZES WITH RUCTION. GC SHALL PROVIDE ALL REQUIRED FRAMED OPENINGS, HEADERS, ELS, ETC. AS NECESSARY.

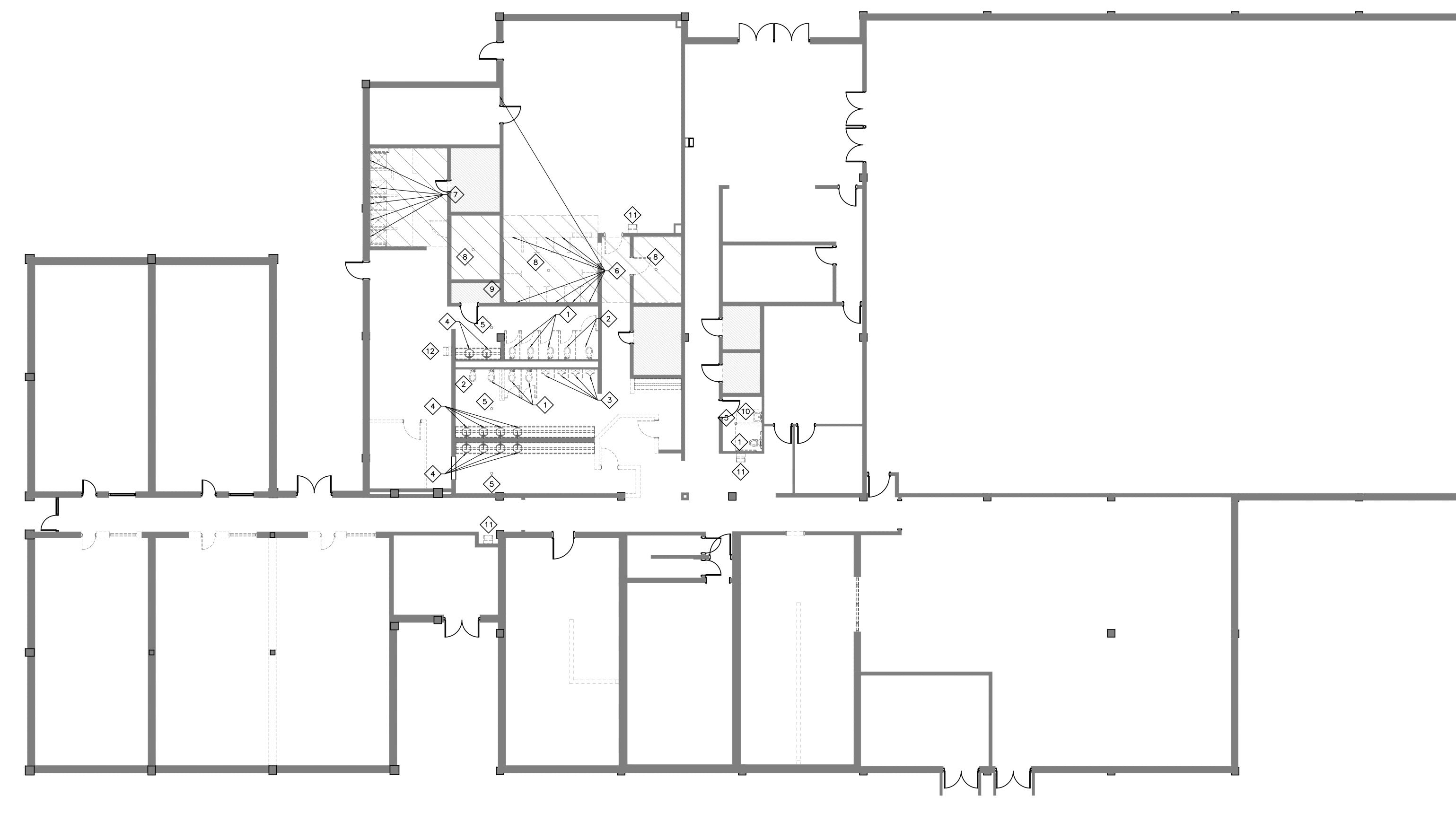
FIXTURE LOCATIONS, SIZES, AND ROUTING WITH GC PRIOR TO CONSTRUCTION. EAR PATH THROUGH FRAMING AND MASONRY COMPONENTS TO ACCOMMODATE

	PLUMBING A	BBREVIATIONS	
	Α		Μ
A	AMPS	MAX	MAXIMUM
AFF	ABOVE FINISHED FLOOR	MBH	ONE THOUSAND BRITISH THERMAL UNITS PER HOUR
ASSE	AMERICAN SOCIETY OF SAFETY ENGINEERS	MC	MECHANICAL CONTRACTOR
	С	MCA	MINIMUM CIRCUIT AMPACITY
		MDPE	MEDIUM DENSITY POLYETHYLENE
CFH	CUBIC FEET PER HOUR	MIN	МІЛІМИМ
СО	CLEAN OUT	MOCP	MAXIMUM OVERCURRENT PROTECTION
CW	COLD WATER		Ν
	D	NIC	NOT IN CONTRACT
		NRS	NON RISING STEM
D		NTS	NOT TO SCALE
DCW DHW	DOMESTIC COLD WATER DOMESTIC HOT WATER		P
DHW	DIMENSION RATIO	PC	PLUMBING CONTRACTOR
		PH	PHASE
	E	PRV	PRESSURE REDUCING VALVE
EC	ELECTRICAL CONTRACTOR	PSIA	POUNDS PER SQUARE INCH ATMOSPHERE
	F	PSIG	POUNDS PER SQUARE INCH GAUGE
F	FAHRENHEIT	PSI	POUNDS PER SQUARE INCH
FCO	FLOOR CLEAN OUT		
FT	FOOT/FEET		R
	G	RPM	REVOLUTIONS PER MINUTE
G	GAS	RPZ	REDUCED PRESSURE ZONE
GAL	GALLONS		
GC	GENERAL CONTRACTOR		S
GCO	GRADE CLEAN OUT	S	SANITARY
	H	SQFT	SQUARE FEET
HB	HOSE BIB		Т
HDPE	HIGH DENSITY POLYETHYLENE	TW	TEMPERED WATER
HP	HORSEPOWER	T&P	TEMPERATURE AND PRESSURE
HW	HOT WATER	TYP	TYPICAL
HWR	HOT WATER RETURN		U
HWS	HOT WATER SUPPLY	UV	ULTRA VIOLET
	K		
ĸw	KILOWATT		\bigvee
		V	VOLTAGE OR VENT
		VTR	VENT TO ROOF
LBS	POUNDS		W
LNG	LIQUEFIED NATURAL GAS	W	WATT
LP	LIQUEFIED PETROLEUM (PROPANE OR BUTANE)	WCO	WALL CLEAN OUT
LPG	LIQUEFIED PETROLEUM GAS (PROPANE OR BUTANE)	WH	WATER HEATER
LW	LAB WASTE		

	PLUMBING SYMBOLS
	COLD WATER
	EXISTING COLD WATER
	HOT WATER
	EXISTING HOT WATER
	HOT WATER RETURN
	EXISTING HOT WATER RETURN
	SANITARY
	EXISTING SANITARY
	VENT
	EXISTING VENT
—— GAS ——— GAS ——	GAS
—— GAS ——— GAS ——	EXISTING GAS
	FIRE PROTECTION
_ · · · ·	EXISTING FIRE PROTECTION
	EXISTING TO BE REMOVED
μ	LEVER BALL VALVE
ŕ <u>s</u>	HOSE BIB
-	CONNECT TO EXISTING
	CAP AND SEAL

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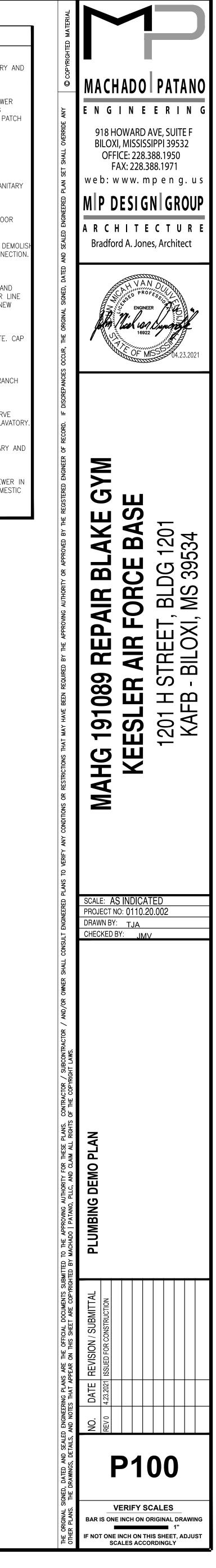




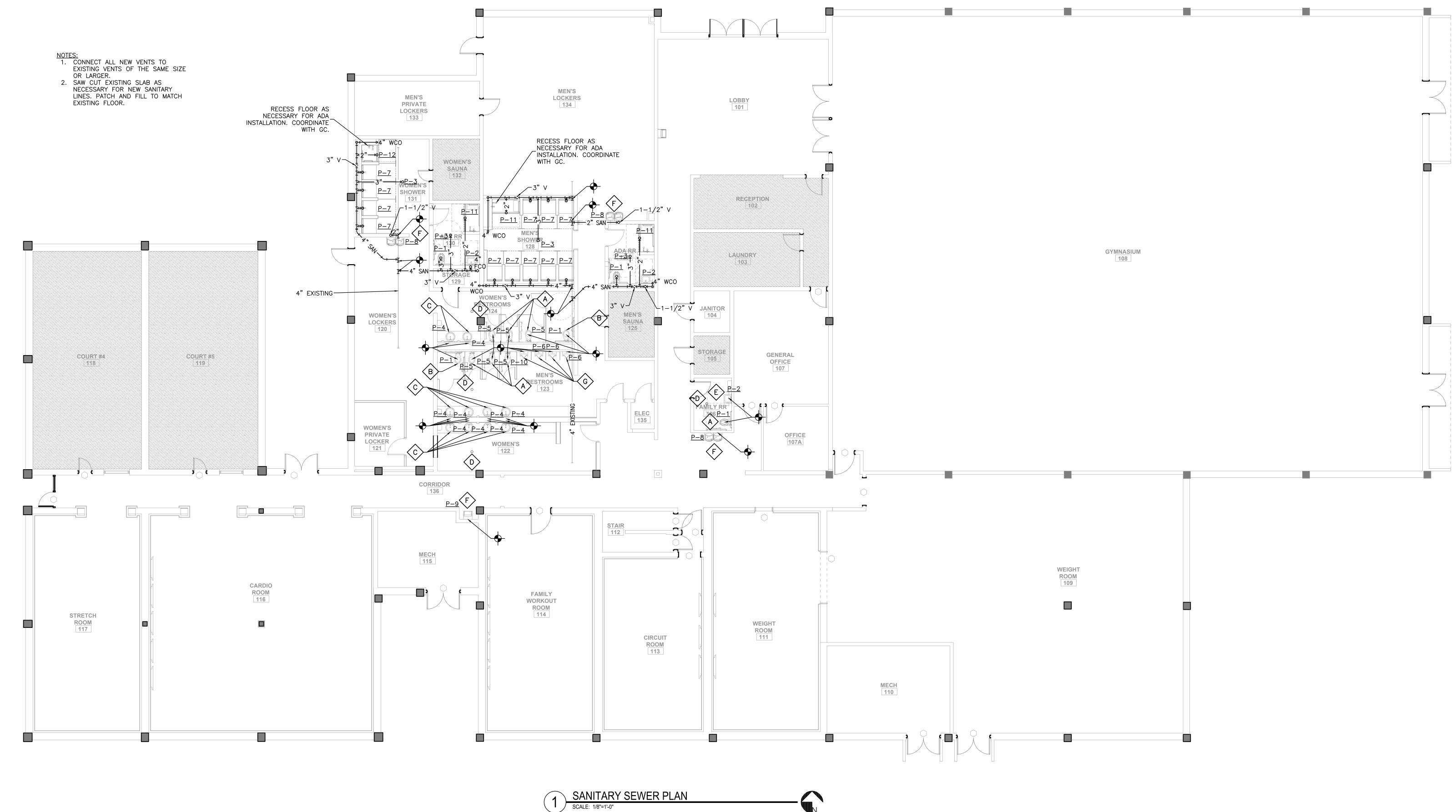
1 PLUMBING DEMO PLAN SCALE: 1/8"=1'-0"

PLUMBING DEMOLITION KEY NOTES

	CONTRACTOR SHALL DEMOLISH EXISTING WATER CLOSET. PRESERVE SANITARY AND DOMESTIC WATER CONNECTIONS FOR NEW WATER CLOSET.
	CONTRACTOR SHALL DEMOLISH EXISTING WATER CLOSET. CAP SANITARY SEWER BELOW FINISH FLOOR AND PATCH TO MATCH EXISTING. DEMOLISH EXISTING DOMESTIC WATER LINE BACK TO MAIN AND CAP AT BRANCH CONNECTION. PATCH WALL TO LIKE NEW CONDITION.
$\langle 3 \rangle$	CONTRACTOR SHALL DEMOLISH EXISTING URINAL. PRESERVE SANITARY AND DOMESTIC WATER CONNECTIONS FOR NEW URINAL.
	CONTRACTOR SHALL DEMOLISH EXISTING DROP-IN LAVATORY. PRESERVE SANITARY AND DOMESTIC WATER CONNECTIONS FOR NEW LAVATORY.
$\langle 5 \rangle$	CONTRACTOR SHALL DEMOLISH EXISTING FLOOR DRAIN GRATE. EXISTING FLOOR DRAIN SHALL BE CAPPED/COVERED DURING CONSTRUCTION.
	CONTRACTOR SHALL DEMOLISH EXISTING WALL MOUNTED SHOWER FAUCET. DEMOLISH EXISTING DOMESTIC WATER LINE BACK TO MAIN AND CAP AT BRANCH CONNECTION. PATCH WALL TO LIKE NEW CONDITION.
$\langle \gamma \rangle$	CONTRACTOR SHALL DEMOLISH EXISTING WALL MOUNTED SHOWER FAUCET AND FLOOR MOUNTED SHOWER RECEPTOR. DEMOLISH EXISTING DOMESTIC WATER LINE BACK TO MAIN AND CAP AT BRANCH CONNECTION. PATCH WALL TO LIKE NEW CONDITION. CAP SANITARY SEWER BELOW FINISH FLOOR.
8	CONTRACTOR SHALL DEMOLISH EXISTING FLOOR DRAIN STRAINER AND GRATE. CAP SANITARY SEWER BELOW FINISH FLOOR.
9	CONTRACTOR SHALL DEMOLISH EXISTING STEAMERS AND ALL ACCESSORIES. DEMOLISH EXISTING DOMESTIC WATER LINE BACK TO MAIN AND CAP AT BRANCH CONNECTION. CAP SANITARY SEWER BELOW FINISH FLOOR.
	CONTRACTOR SHALL DEMOLISH EXISTING WALL MOUNTED LAVATORY. PRESERVE SANITARY AND DOMESTIC WATER CONNECTIONS FOR NEW WALL MOUNTED LAVATORY.
	CONTRACTOR SHALL DEMOLISH EXISTING WATER COOLER. PRESERVE SANITARY AND DOMESTIC WATER CONNECTIONS FOR NEW WATER COOLER.
	CONTRACTOR SHALL DEMOLISH EXISTING WATER COOLER. CAP SANITARY SEWER IN WALL AND PATCH AND PAINT WALL TO MATCH EXISTING. CAP EXISTING DOMESTIC WATER LINE IN WALL. PATCH AND PAINT WALL TO LIKE NEW CONDITION.



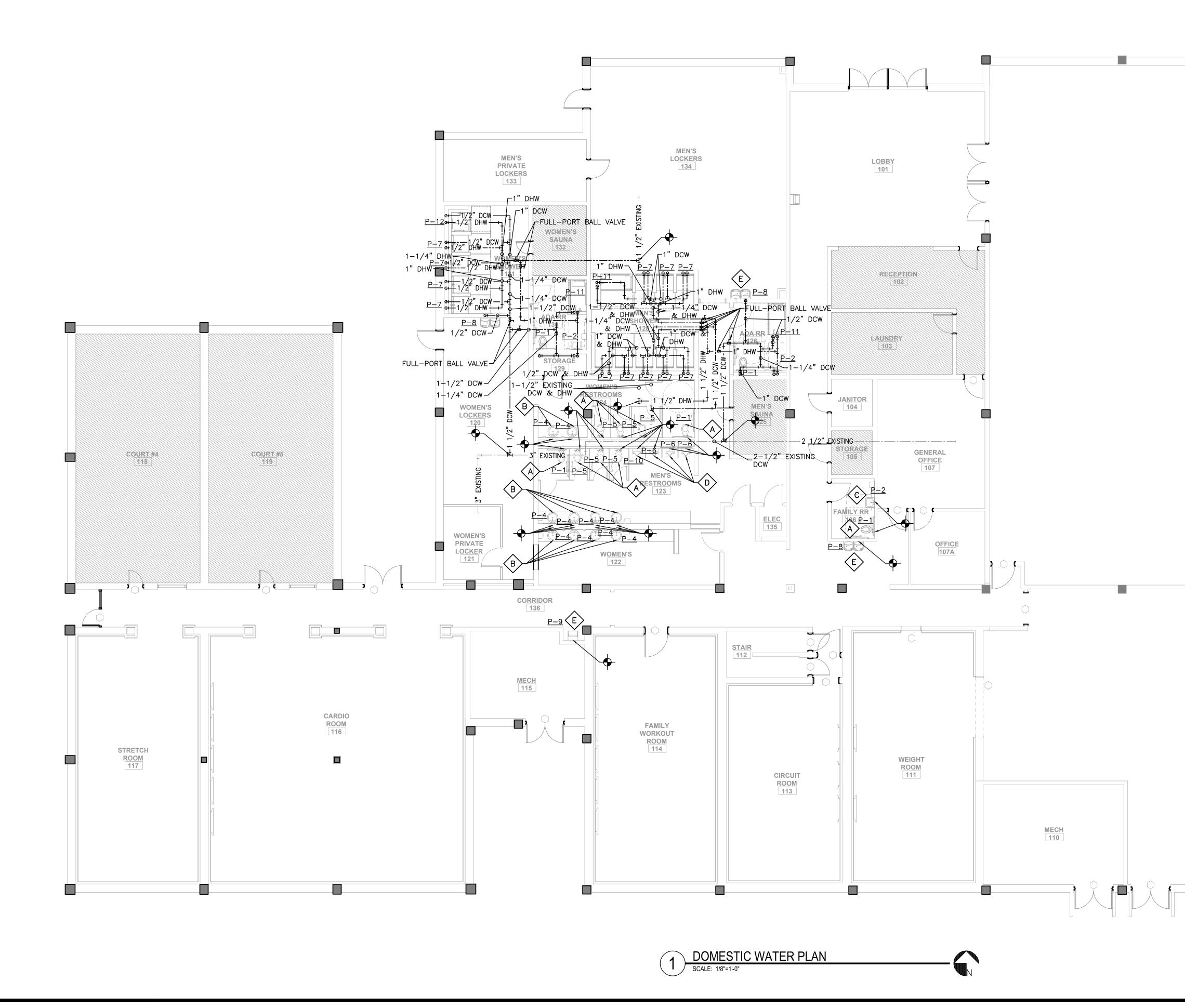




PLUMBING KEY NOTES

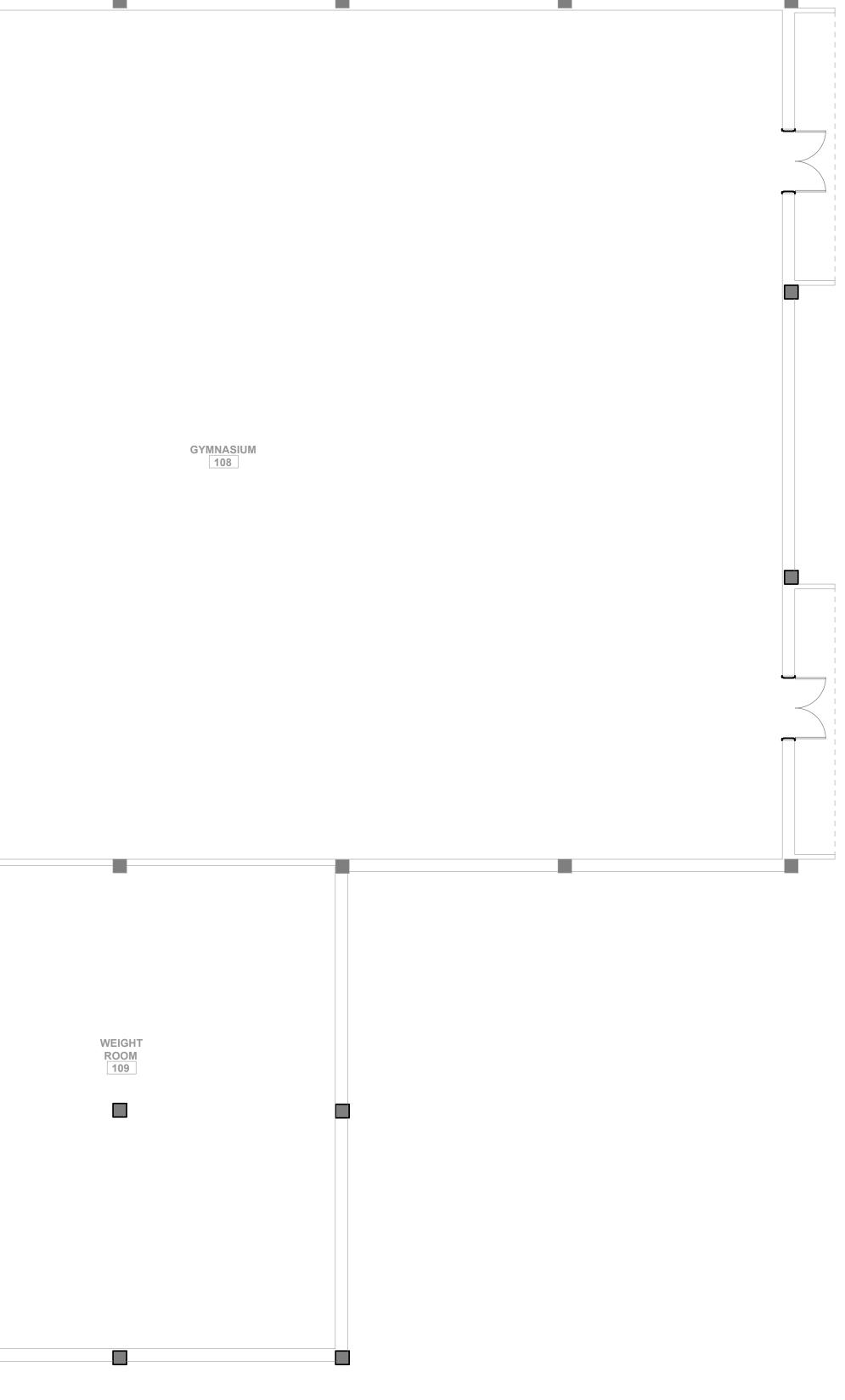
	CONTRACTOR SHALL CONNECT NEW WATER CLOSET TO EXISTING SANITARY SEWER CONNECTION IN FLOOR. PATCH FLOOR AS NECESSARY TO MATCH SURROUNDINGS.
B	CONTRACTOR SHALL CONNECT NEW WATER CLOSET TO EXISTING SANITARY SEWER CONNECTION BELOW FLOOR. INSTALL OFFSET FLANGE/SAW CUT AS NECESSARY FOR ADA COMPLIANT CLEARANCES. PATCH FLOOR AS NECESSARY MATCH SURROUNDINGS.
$\langle \hat{c} \rangle$	CONTRACTOR SHALL CONNECT NEW INTEGRATED LAVATORY TO EXISTING $1-1$, SANITARY SEWER CONNECTION AT EXISTING WALL.
D	CONTRACTOR SHALL INSTALL NEW ROUND STAINLESS STEEL GRATE ON EXIST FLOOR DRAIN. VERIFY SIZE AND MODEL OF EXISTING PRIOR TO ORDERING. EXISTING FLOOR DRAIN SHALL BE CAPPED/COVERED DURING CONSTRUCTION AND THOROUGHLY CLEANED FOLLOWING CONSTRUCTION PRIOR TO INSTALLATI OF NEW GRATE.
E	CONTRACTOR SHALL CONNECT NEW WALL MOUNTED LAVATORY TO EXISTING $1-1/2$ " SANITARY SEWER CONNECTION AT EXISTING WALL.
F	CONTRACTOR SHALL CONNECT NEW WATER COOLER TO EXISTING SANITARY SEWER CONNECTION AT EXISTING WALL.
Ġ	CONTRACTOR SHALL CONNECT NEW URINAL TO EXISTING 2" SANITARY SEWER CONNECTION AT EXISTING WALL.





PLUMBING KEY NOTES

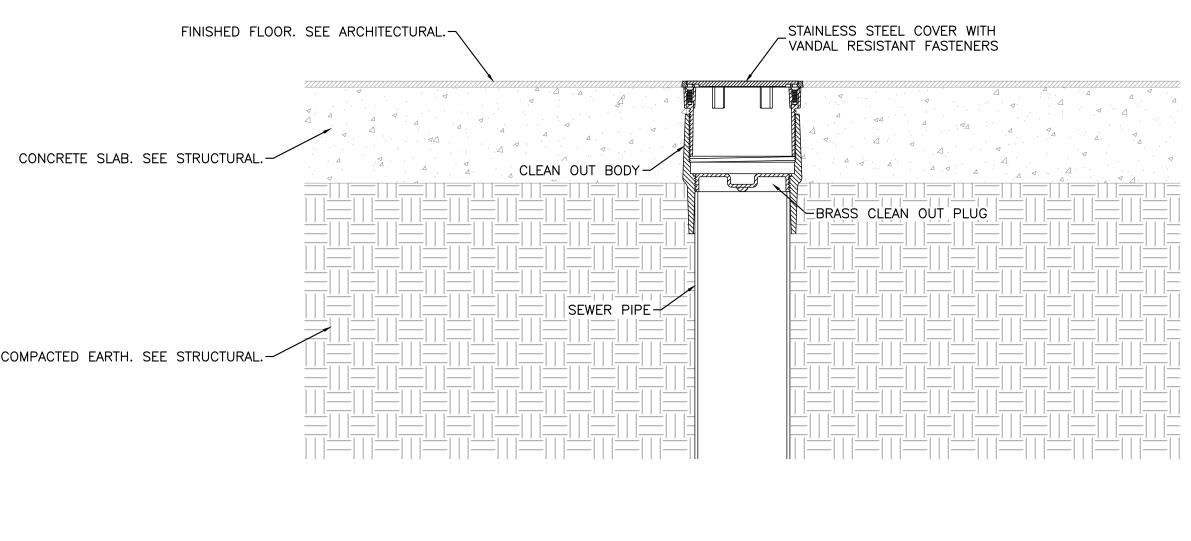
CONTRACTOR SHALL CONNECT NEW WATER CLOSET TO EXISTING DCW LINE CONNECTION AT EXISTING WALL.
 CONTRACTOR SHALL CONNECT NEW INTEGRAL LAVATORY TO EXISTING DCW LINE CONNECTION AT EXISTING WALL.
 CONTRACTOR SHALL CONNECT NEW WALL MOUNTED LAVATORY TO EXISTING DCW LINE CONNECTION AT EXISTING WALL.
 CONTRACTOR SHALL CONNECT NEW URINAL TO EXISTING DCW LINE CONNECTION AT EXISTING WALL.
 CONTRACTOR SHALL CONNECT NEW URINAL TO EXISTING DCW LINE CONNECTION AT EXISTING WALL.
 CONTRACTOR SHALL CONNECT NEW WATER COOLER TO EXISTING DCW LINE CONNECTION AT EXISTING WALL.

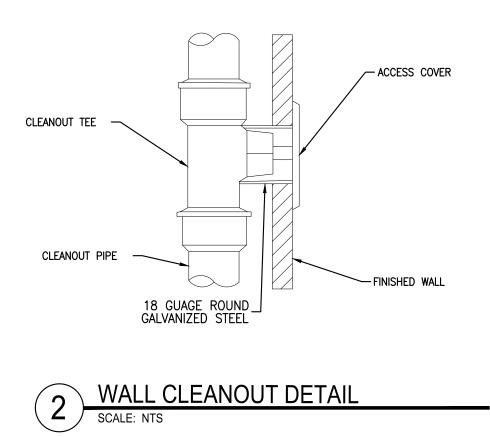




			PLUMBING FIXT	URE SCHEI	DULE										
TAG	DESCRIPTION	MAKE	MODEL		CONNECTIONS										
			MODEL	CW	HW	TW	D	- NOTES							
P-1	ADA FLOOR MOUNT WATER CLOSET-FV	AMERICAN STANDARD	3043.001	1"	N/A	N/A	3"	1,2,3,4,5,2							
P-2	ADA WALL MOUNT LAVATORY	AMERICAN STANDARD	0356.421	1/2"	1/2"	N/A	1-1/4"	1,5,6,7,8,9,10,							
P-3	FLOOR DRAIN	ZURN	ZS415B-SZ1-TSP	N/A	N/A	N/A	3"	5,14,15,2							
P-4	ADA FORMED LAVATORY	INPRO	-	1/2"	1/2"	N/A	1-1/4"	1,5,6,7,8,9,1							
P-5	FLOOR MOUNT WATER CLOSET-FV	AMERICAN STANDARD	3043.001	1"	N/A	N/A	3"	2,3,4,5,15,							
P-6	URINAL-FV	AMERICAN STANDARD	6590.001	3/4"	N/A	N/A	2"	17,19,29							
P-7	32"x32" CUSTOM SHOWER	INPRO	-	1/2	N/A	N/A	2"	25,26,29,							
P-8	ADA HI/LO WATER COOLER	ELKAY	EMABFTL8WSLK	1/2"	N/A	N/A	1-1/2"	1,12,16,17,1							
P-9	SINGLE WATER COOLER	ELKAY	EMABF8WSLK	1/2"	N/A	N/A	1-1/4"	12,15,16,17,2							
P-10	ADA URINAL-FV	AMERICAN STANDARD	6590.001	3/4"	N/A	N/A	2"	1,17,19,2							
² –11	ADA 36"x60" CUSTOM SHOWER	INPRO	_	1/2"	1/2"	N/A	2"	1,24,25,27,2							
P-12	ADA 36"x36" CUSTOM SHOWER	INPRO	-	1/2"	1/2"	N/A	2"	1,24,25,28,2							
" WCO	4" WALL CLEAN OUT	ZURN	Z1446-BP	N/A	N/A	N/A	4"	21,22,23,2							
"FCO	4" FLOOR CLEAN OUT	ZURN	ZS1400-B-BP	N/A	N/A	N/A	4"	21,22,29							
1	MOUNT WITH ADA CLEARANCES				2 WITH TOTO TET1LA32#C	P FLUSH VALVE OR APF	PROVED EQUAL								
3	WITH CHURCH 295SSCT SEAT OR APPROVE	ED EQUAL			4 COORDINATE RIGHT OR LEFT FLUSH VALVE LEVER INSTALLATION WITH ADA (OPEN SIDE)										
5	OR APPROVED EQUAL				6 WITH ADA GRID STRAINER										
7	WITH 1–1/4"17 GAUGE P–TRAP				8 WITH BALL STOPS AND	RIGID SUPPLIES									
9	WITH ADA TRAP, STOP, AND SUPPLY PROT	ECTORS			10 WITH TOTO TEL105–D10 OR APPROVED EQUAL	DET (WITH INTEGRATED N	IXING VALVE) FAUCET	(ASSE 1070 COMPL							
11	WITH ZURN Z843M-XL FAUCET				12 WITH BOTTLE FILLER										
13	WITH DOME STRAINER				14 WITH ASSE 1072 TRAP SEAL PROTECTION DEVICE										
15	MOUNT WITH STANDARD CLEARANCES				16 WITH CONCEALED SUPPORT CARRIER										
17	WITH TOTO TEU1LA12#CP SENSOR FLUSH	VALVE OR APPROVED EQUAL			18 WITH CANE APRON										
19	WITH ZURN VERTICAL CARRIER SYSTEM OR	APPROVED EQUAL			20 WITH ZURN CARRIER SYSTEM OR APPROVED EQUAL										
21	WITH BRONZE PLUG				22 WITH ROUND STAINLESS	STEEL TOP									
23	CAP OPEN END AS NECESSARY				24 WITH ZURN Z7000-HW	3 ADA SHOWER FAUCET									
25	WITH ZURN Z7301-SS-MT-S9-PEX SHOW	ER FAUCET			26 WITH STAINLESS STEEL	LINEAR SHOWER DRAIN,	STANDARD SLOTTED G	RATE							
27	WITH ADA STAINLESS STEEL LINEAR SHOWE	ER DRAIN, STANDARD SLOTTED (GRATE		28 WITH ADA STAINLESS ST	FEEL LINEAR SHOWER DI	RAIN, STANDARD SLOTTE	D GRATE							
29	OR EQUAL			30 INCLUDE BASE AND WALLS											

COMPACTED EARTH. SEE STRUCTURAL.--





1 FLOOR CLEANOUT DETAIL SCALE: NTS



GENERAL 1. ALL WORK SHALL CONFORM TO THE LATEST EDITIONS OF THE INTERNATIONAL CODE AND ALL LOCAL	f. ROUND BRANCH DUCTS (0–600 FPM)f.1. ROUND ELBOWS MAY BE SHORT
ORDINANCES AS ADOPTED BY THE LOCAL JURISDICTION. 2. CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR NECESSARY FOR THE COMPLETE INSTALLATION AND OPERATION OF THE SYSTEMS INDICATED ON THE CONTRACT DOCUMENTS AND DRAWINGS EVEN IF NOT SPECIFICALLY SHOWN.	BE 1 TIME THE DIAMETER OF TH ELBOWS SHALL BE 3 GORE MININ SMOOTH DIE STAMPED/PRESSED WHEN THE DUCT IS EXTERNALLY ACCEPTABLE.
3. THE DRAWINGS ARE, IN PART, DIAGRAMMATIC AND DO NOT ALWAYS SHOW ALL NECESSARY MATERIALS AND EQUIPMENT TO SCALE OR IN EXACT LOCATIONS. IT IS THE CONTRACTORS RESPONSIBILITY TO CHECK ALL MEASUREMENTS, COORDINATE ALL WORK WITH OTHER TRADES, REVIEW ALL ARCHITECTURAL AND STRUCTURAL DRAWINGS, AND VISIT THE JOBSITE TO MAKE APPROPRIATE MEASUREMENTS.	g. CONCEALED AND/OR EXTERNALLY INSU LONGITUDINAL SEAM. BUTT WELD, LAP ACCEPTABLE FOR LONGITUDINAL SEAMS PRESSURE DUCT. EXPOSED ROUND AN EXPOSED ROUND AND OVAL SPIRAL SI WYE FITTINGS AS DESIGNED. TAKEOFFS
4. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND INSPECTIONS AND SHALL PAY ALL ASSOCIATED FEES FOR SCOPE OF WORK.	h. ALL EXTERNALLY INSULATED SHEET ME MASTIC AND TAPED OVER WITH DUCT
5. WHEN THE SPECIFICATIONS OR DRAWINGS ARE UNCLEAR OR IN CONFLICT WITH CODES OR OTHER TRADES, THE CONTRACTOR SHALL BRING THIS TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION BEFORE SUBMITTING A BID.	JOINTS SHALL BE SEALED AIRTIGHT WI PROVIDE A FINISHED APPEARANCE.
 SUBMITTALS AND SHOP DRAWINGS FOR ALL EQUIPMENT, MATERIALS, AND ACCESSORIES SHALL BE PROVIDED TO THE OWNER AND ENGINEER FOR REVIEW AND COMMENT PRIOR TO ORDER, 	i. ALL SQUARE AND RECTANGULAR VOLU
MANUFACTURE, FABRICATION, AND INSTALLATION. FAILURE TO DO SO SHALL NOT RELIEVE THIS CONTRACTOR OF THE RESPONSIBILITY, CONSEQUENCES, AND POSSIBLE COSTS OF SUCH ACTION OR LACK OF ACTION REGARDLESS OF ANY AND ALL ERRORS OR OMISSIONS ON THESE DOCUMENTS. THIS ENGINEER SHALL NOT BE HELD LIABLE FOR ANY COSTS ASSOCIATED WITH THIS CONTRACTOR'S FAILURE TO COMPLY WITH THIS ITEM. IF SUBSTITUTIONS FOR SPECIFIED ITEMS ARE MADE, IT IS THIS	DIRECTLY TO AN OUTLET) WHETHER TH WHETHER THE OUTLET GRILLE OR DIFF DAMPERS SHALL BE INSTALL A MINIMU DUCT DIMENSION) DOWNSTREAM OF TH
CONTRACTOR'S RESPONSIBILITY TO PROVE PERFORMANCE, COMPATIBILITY, AND CONFORMANCE WITH THE ORIGINAL DESIGN AND SPECIFICATIONS. RE-DESIGN BY THIS ENGINEER TO ACCOMMODATE SUBSTITUTIONS SHALL NOT BE PERFORMED. OTHERWISE, IT WILL BE CONSIDERED ADDITIONAL WORK FOR WHICH COMPENSATION WILL BE REQUIRED.	 k. CONCEALED DUCTWORK SHALL BE BRIGHT BE PAINT GRIP FINISH GALVANIZED STORE I. EXTERIOR DUCTWORK SHALL BE PAINT TOPCOATS OF FINISH PAINT. ROOFTOP
7. ALL ACTUAL EQUIPMENT, MATERIALS, AND ACCESSORIES TO BE INSTALLED SHALL BE FULLY COORDINATED WITH THE ELECTRICAL, PLUMBING, CIVIL, STRUCTURAL, AND ARCHITECTURAL CONTRACTORS PRIOR TO ORDER, MANUFACTURE, FABRICATION, AND INSTALLATION. THIS INCLUDES	7. MEDIUM PRESSURE DUCTWORK (SUPPLY U
BUT IS NOT LIMITED TO ELECTRICAL DATA, WEIGHTS, PLUMBING REQUIREMENTS, DIMENSIONS, PENETRATIONS, ETC. FAILURE TO DO SO SHALL NOT RELIEVE THIS CONTRACTOR OF THE RESPONSIBILITY, CONSEQUENCES, AND POSSIBLE COSTS OF SUCH ACTION OR LACK OF ACTION REGARDLESS OF ANY AND ALL ERRORS OR OMISSIONS ON THESE DOCUMENTS. THIS ENGINEER	 a. ALL DUCTWORK UPSTREAM OF VAV BC STANDARDS AND SHALL CONFORM TO CONSTRUCTION STANDARDS.
 8. ANY AND ALL DEVIATIONS FROM THE DESIGN DOCUMENTS WITHOUT THIS ENGINEER'S APPROVAL INDICATES ACCEPTANCE BY THIS CONTRACTOR AND/OR OWNER FOR THE RESPONSIBILITY OF THE 	 ALL SUPPLY DUCTWORK SHALL BE GA GAUGE SHALL BE AS PER SMACNA DU DEPENDING ON SIZE AND SHAPE). 28 ACCEPTABLE.
PERFORMANCE OF THE SYSTEM AFFECTED. THIS ENGINEER SHALL NOT BE HELD LIABLE FOR ANY COSTS ASSOCIATED WITH THIS CONTRACTOR'S FAILURE TO FOLLOW THE DESIGN DOCUMENTS. IF MODIFICATIONS TO THE SPECIFIED DESIGN ARE MADE, IT IS THIS CONTRACTOR'S RESPONSIBILITY TO	c. ALL ROUND AND OVAL DUCT SHALL B d. ROUND AND OVAL SHEET METAL DUCT
PROVE PERFORMANCE, COMPATIBILITY, AND CONFORMANCE WITH THE ORIGINAL DESIGN AND SPECIFICATIONS. RE-DESIGN BY THIS ENGINEER TO ACCOMMODATE MODIFICATIONS SHALL NOT BE PERFORMED. OTHERWISE, IT WILL BE CONSIDERED ADDITIONAL WORK FOR WHICH COMPENSATION	e. ALL ROUND AND OVAL SHEET METAL DOOT e. ALL ROUND AND OVAL ELBOWS SHALL
 WILL BE REQUIRED. SITE VISITS, INSPECTIONS, CALCULATIONS, COORDINATION, ETC. PERFORMED BY THIS ENGINEER TO INVESTIGATE PROBLEMS ASSOCIATED WITH DESIGN DEVIATIONS WILL ALSO BE CONSIDERED ADDITIONAL WORK FOR WHICH COMPENSATION WILL BE REQUIRED. 9. ANY ERRORS OR OMISSIONS ON THESE DOCUMENTS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER FOR REVIEW AND CORRECTION. 	DUCT SHALL BE 1.5 TIMES THE DIAME MINIMUM. 60° ELBOWS SHALL BE 4 G 30° AND SMALLER ANGLE ELBOWS MA` ARE ACCEPTABLE. PLEATED AND ADJUS
10. THE CONSTRUCTION DOCUMENTS ARE COMPRISED OF BOTH DRAWINGS AND SPECIFICATIONS (PROJECT MANUAL). THE GENERAL CONTRACTOR SHALL NOT BREAK OUT SECTIONS TO SUB-CONTRACTORS OR VENDORS.	f. ALL EXTERNALLY INSULATED SHEET ME MASTIC AND TAPED OVER WITH DUCT DUCTWORK JOINTS SHALL BE SEALED
 11. THE CONTRACTOR IS RESPONSIBLE RESPONSIBLE FOR COORDINATING WORK OF ALL TRADES TO INSURE A USABLE & FUNCTIONAL END PRODUCT. ANY CONFLICTS BETWEEN THE DRAWINGS AND SPECIFICATIONS SHALL BE CLARIFIED BY THE ARCHITECT/ENGINEER. IF NO CLARIFICATION IS ISSUED THE BIDDER SHALL BID THE MOST STRINGENT PRODUCT OR APPLICATION. 	CLEAN TO PROVIDE A FINISHED APPEA g. CONCEALED DUCTWORK SHALL BE BRI BE PAINT GRIP FINISH GALVANIZED ST C. DUCT INSULATION
12. IF DISCREPANCIES ARE ENCOUNTERED BETWEEN THE DRAWINGS, DIAGRAMS, DESCRIPTIONS, NOTES, SYMBOLS, AND/OR SPECIFICATIONS, THE MOST STRINGENT PRODUCT OR APPLICATION APPLIES IN ALL CASES. IF A COMPONENT, SYSTEM, EQUIPMENT, POINT, PROGRAM, ETC. IS LISTED IN ONE DOCUMENT BUT NOT ANOTHER, OR IF IT IS NECESSARY FOR THE OPERATION, IT SHALL BE PROVIDED AND INSTALLED.	 ALL SHEET METAL AND FLEXIBLE SUPPLY, INSULATED. ALL INTERIOR AND EXTERIOR EXPOSED SU SUFET METAL CONSTRUCTION AND SUAL
13. THIS ENGINEER SHALL NOT BE HELD LIABLE FOR COSTS ASSOCIATED WITH ERRORS AND/OR OMISSIONS ON THESE DOCUMENTS IN EXCESS OF THE COST AND/OR TIME FOR THIS ENGINEER TO CORRECT THE DOCUMENTS. IN ANY CASE, THE LIMIT OF LIABILITY FOR THIS ENGINEER SHALL BE NO MORE THAN THE COST OF THIS ENGINEER'S INDIVIDUAL FEE, REGARDLESS OF THE TOTAL DESIGN FEE CHARGED FOR THE SET OF CONSTRUCTION DOCUMENTS.	SHEET METAL CONSTRUCTION AND SHALL 3. ALL CONCEALED SHEET METAL AND FLEXIE SHALL BE EXTERNALLY INSULATED, UNLESS 4. INTERNAL DUCT INSULATION
14. TO THE FULLEST EXTENT PERMITTED BY LAW, THE TOTAL LIABILITY IN THE AGGREGATE, OF THIS ENGINEER AND THIS ENGINEER'S OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, AND INDEPENDENT	a. WHERE INDICATED ON THE PLANS, SHI INSULATION.
PROFESSIONAL ASSOCIATES, AND ANY OF THEM, TO OWNER AND ANY ONE CLAIMING BY, THROUGH OR UNDER OWNER, FOR ANY AND ALL INJURIES, CLAIMS, LOSSES, EXPENSES, OR DAMAGES WHATSOEVER ARISING OUT OF OR IN ANY WAY RELATED TO THIS ENGINEER'S SERVICES, THE PROJECT OR THESE DOCUMENTS, FROM ANY CAUSE OR CAUSES WHATSOEVER, INCLUDING BUT NOT LIMITED TO, THE NEGLIGENCE, ERRORS, OMISSIONS, STRICT LIABILITY, BREACH OF CONTRACT,	b. WHEN INSTALLED IN FULLY CONDITION INSULATED AND/OR CONDITIONED ENVE OTHERWISE SPECIFIED.
MISREPRESENTATION, OR BREACH OF WARRANTY OF THIS ENGINEER; OR THIS ENGINEER'S OFFICERS, DIRECTORS, EMPLOYEES, AGENTS OR INDEPENDENT PROFESSIONAL ASSOCIATES, OR ANY OF THEM, SHALL NOT EXCEED THE TOTAL COMPENSATION RECEIVED BY THIS ENGINEER FOR SERVICES PROVIDED. 15. THE USE OF THESE DOCUMENTS FOR CONSTRUCTION SIGNIFIES THIS OWNER, TENANT, AND	 c. WHEN INSTALLED IN UNCONDITIONED S ENVELOPE, INTERNAL INSULATION SHAL d. WHEN INSTALLED EXTERIOR TO THE BU THICK UNLESS OTHERWISE SPECIFIED.
CONTRACTORS AGREEMENT WITH THE ABOVE REQUIREMENTS REGARDLESS OF ANY OTHER PRIOR, CURRENT, OR FUTURE AGREEMENT AND/OR CONTRACT.	e. THE FIRST 10'-0" OF RECTANGULAR/S OF ANY FAN SHALL BE INTERNALLY IN
DUCTWORK 1. ALL DUCT SIZES ON THE PLANS ARE CLEAR, INSIDE DIMENSIONS.	f. THE FIRST 10'-0" OF RECTANGULAR/S BOX SHALL BE INTERNALLY INSULATED
 ALE DOOT SIZES ON THE FEARS ARE CLEAR, INSIDE DIMENSIONS. TURNING VANES SHALL BE INSTALLED IN ALL RECTANGULAR/SQUARE ELBOWS AND TEES 45° OR LARGER. 	5. ALL SHEET METAL AND FLEXIBLE SUPPLY, EXTERNALLY INSULATED WITH 2" THICK INS SUPPLY AND RETURN GRILLE COLLARS AN
 ALL INTERIOR AND EXTERIOR EXPOSED DUCTWORK SHALL BE SHEET METAL CONSTRUCTION. CONCEALED DUCTWORK MAY BE SHEET METAL OR FLEXIBLE CONSTRUCTION AS INDICATED. ALL EXHAUST DUCTWORK SHALL BE SHEET METAL CONSTRUCTION. FLEXIBLE DUCTWORK IS NOT 	 D. PIPE INSULATION 1. ALL CONDENSATE PIPING WITHIN THE BUIL LINES, SHALL BE INSULATED WITH 1/2" T
ACCEPTABLE. 5. ALL SHEET METAL DUCT CONNECTIONS TO ANY FAN POWERED EQUIPMENT SHALL BE MADE WITH ELEXIBLE DUCT CONNECTORS 3" MIN (6" MAX IN LENCTH	2. REFRIGERANT SUCTION PIPING LESS THAN CELLULAR INSULATION. PIPING $1-1/2$ " OR
 FLEXIBLE DUCT CONNECTORS 3" MIN/6" MAX IN LENGTH. 6. LOW PRESSURE DUCTWORK (ALL EXHAUST UNLESS OTHERWISE NOTED, ALL RETURN, ALL OUTDOOR 	ALL JOINTS SHALL BE SEALED. LIQUID LIN BUILDING IN UNCONDITIONED SPACES OUT
AIR, AND ALL SUPPLY DOWNSTREAM OF ALL VAV BOXES) a. ALL SUPPLY DUCTWORK, RETURN DUCTWORK, AND EXHAUST DUCTWORK SHALL BE	3. EXPOSED EXTERIOR PIPE INSULATION SHAI TIGHT.
CONSTRUCTED TO 2" WG PRESSURE CLASS STANDARDS AND SHALL CONFORM TO THE LATEST EDITIONS OF THE SMACNA DUCT CONSTRUCTION STANDARDS.	4. EXPOSED PIPE INSULATION AT INTERIOR A JACKETING. JACKETING SHALL BE FACTORY
 ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTION UNLESS OTHERWISE NOTED IN THIS SECTION. SHEET METAL GAUGE SHALL BE AS PER SMACNA DUCT CONSTRUCTION STANDARDS (28 GAUGE OR LESS DEPENDING ON SIZE AND SHAPE). 30 GAUGE OR HIGHER SHEET METAL DUCT IS NOT ACCEPTABLE. c. FLEXIBLE DUCTWORK 	 ALL HOT WATER PIPING 1-1/4" AND SMA INSULATION. ALL HOT WATER PIPING 1-1/ INSULATION. ALL JOINTS SHALL BE SEALED ALL CHILLED WATER PIPING SHALL BE INS SUMMER DE MODESTED WITH ALL MUMINEMAND
C. FLEXIBLE DUCTWORK C.1. WHERE CONCEALED, FLEXIBLE DUCTWORK MAY BE USED IN LIEU OF SHEET METAL CONSTRUCTION FOR THE FINAL CONNECTION TO SUPPLY AND RETURN CEILING GRILLES.	SHALL BE JACKETED WITH ALUMINUM AND 7. EXTERIOR CHILLED WATER PIPING SHALL E
c.2. FLEXIBLE DUCT CONNECTIONS SHALL BE NO GREATER THAN 6 FT IN LENGTH.	FOOT OF PIPE. 8. ALL FITTINGS, JOINTS, ELBOWS, VALVES, E
C.3. FLEXIBLE DUCT SHALL BE INSTALLED AS STRAIGHT AS POSSIBLE IN ACCORDANCE WITH THE PLANS AND SHALL HAVE NO KINKS OR DRASTIC BENDS.	E. HOT AND CHILLED HYDRONIC WATER PIPING
 d. ALL ROUND SUPPLY BRANCH CONNECTIONS SHALL BE MADE AT 45°, WITH A BOOT TAP AND SQUARE (RECTANGULAR) TO ROUND TRANSITION, OR WITH A CONICAL CONNECTION. ALL SQUARE (RECTANGULAR) SUPPLY BRANCH CONNECTIONS SHALL BE MADE WITH BOOT TAPS. 90° STRAIGHT TAPS AND SQUARE (RECTANGULAR) TO ROUND TAPS ARE NOT ACCEPTABLE. e. ROUND MAIN DUCTS (601-2,000 FPM) 	 THE FOLLOWING MATERIALS ARE ACCEPTAE a. SCHEDULE 40 STEEL. MATCH EXISTING HOT AND CHILLED WATER PIPING, VALVES, RATED FOR 150 PSI PRESSURE CLASS MI
e 1 ALL ROUND FLIBOWS SHALL BE FULL RADIUS TYPE (THE CENTER LINE RADIUS OF DUCT	3. ALL ELBOWS SHALL BE LONG RADIUS TYP
SHALL BE 1.5 TIMES THE DIAMETER OF THE DUCT). 90° ELBOWS SHALL BE 5 GORE MINIMUM. 60° ELBOWS SHALL BE 4 GORE MINIMUM. 45° ELBOWS SHALL BE 3 GORE MINIMUM. 30° AND SMALLER ANGLE ELBOWS MAY BE 2 GORE. SMOOTH DIE STAMPED/PRESSED ELBOWS ARE ACCEPTABLE. PLEATED AND ADJUSTABLE ELBOWS ARE NOT	4. ALL PIPING CONNECTIONS AT MOTORIZED FLEXIBLE CONNECTIONS.F. VALVES

- OUND ELBOWS MAY BE SHORT RADIUS TYPE (THE CENTER LINE RADIUS OF DUCT SHALL E 1 TIME THE DIAMETER OF THE DUCT). 90° ELBOWS SHALL BE 4 GORE MINIMUM. 60° BOWS SHALL BE 3 GORE MINIMUM. 45° AND SMALLER ANGLE ELBOWS MAY BE 2 GORE. MOOTH DIE STAMPED/PRESSED ELBOWS ARE ACCEPTABLE IN CONCEALED AREAS AND/OR HEN THE DUCT IS EXTERNALLY INSULATED. PLEATED AND ADJUSTABLE ELBOWS ARE NOT CCEPTABLE.
- ALED AND/OR EXTERNALLY INSULATED ROUND SHEET METAL DUCT MAY BE SPIRAL OR UDINAL SEAM. BUTT WELD, LAP WELD, OR GROOVED SEAM PIPE LOCK/FLAT LOCK IS FABLE FOR LONGITUDINAL SEAMS. SNAPLOCK SEAMS SHALL ONLY BE USED FOR POSITIVE JRE DUCT. EXPOSED ROUND AND OVAL SHEET METAL DUCT SHALL BE SPIRAL SEAM. D ROUND AND OVAL SPIRAL SHEET METAL DUCT BRANCHES SHALL BE CONICAL TEES OR TINGS AS DESIGNED. TAKEOFFS ARE NOT ACCEPTABLE.
- TERNALLY INSULATED SHEET METAL DUCTWORK JOINTS SHALL BE SEALED AIRTIGHT WITH AND TAPED OVER WITH DUCT TAPE. ALL INTERNALLY INSULATED SHEET METAL DUCTWORK SHALL BE SEALED AIRTIGHT WITH MASTIC AND THE EXTERIOR SURFACE WIPED CLEAN TO A FINISHED APPEARANCE.
- QUARE AND RECTANGULAR VOLUME DAMPERS SHALL BE OPPOSED BLADE TYPE. DAMPERS SHALL BE INSTALLED IN ALL BRANCH DUCTWORK (DUCTWORK LEADING LY TO AN OUTLET) WHETHER THEY ARE SHOWN IN PLAN OR NOT AND REGARDLESS OF ER THE OUTLET GRILLE OR DIFFUSER IS SPECIFIED WITH A DAMPER. BRANCH VOLUME RS SHALL BE INSTALL A MINIMUM OF 3 DUCT DIAMETERS (OR 3 TIMES THE LARGEST DIMENSION) DOWNSTREAM OF THE NEAREST FITTING WHERE SPACE AND ACCESS ALLOWS.
- ALED DUCTWORK SHALL BE BRIGHT FINISH GALVANIZED STEEL. EXPOSED DUCTWORK SHALL NT GRIP FINISH GALVANIZED STEEL SUITABLE FOR FIELD PAINTING.
- OR DUCTWORK SHALL BE PAINTED WITH A RUST PREVENTATIVE PRIMER AND TWO ATS OF FINISH PAINT. ROOFTOP DUCTWORK SHALL BE PAINTED BRIGHT WHITE.
- RESSURE DUCTWORK (SUPPLY UPSTREAM OF ALL VAV BOXES)
- CTWORK UPSTREAM OF VAV BOXES SHALL BE CONSTRUCTED TO 4" WG PRESSURE CLASS RDS AND SHALL CONFORM TO THE LATEST EDITIONS OF THE SMACNA DUCT RUCTION STANDARDS.
- IPPLY DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTION. SHEET METAL SHALL BE AS PER SMACNA DUCT CONSTRUCTION STANDARDS (26 GAUGE OR LESS DING ON SIZE AND SHAPE). 28 GAUGE OR HIGHER SHEET METAL DUCT IS NOT
- OUND AND OVAL DUCT SHALL BE SPIRAL SEAM.
- AND OVAL SHEET METAL DUCT BRANCHES SHALL BE CONICAL TEES OR WYE FITTINGS AS ED. TAKEOFFS ARE NOT ACCEPTABLE.
- OUND AND OVAL ELBOWS SHALL BE FULL RADIUS TYPE (THE CENTER LINE RADIUS OF SHALL BE 1.5 TIMES THE DIAMETER OF THE DUCT) 90° FLBOWS SHALL BE 5 GORE JM. 60° ELBOWS SHALL BE 4 GORE MINIMUM. 45° ELBOWS SHALL BE 3 GORE MINIMUM. ID SMALLER ANGLE ELBOWS MAY BE 2 GORE. SMOOTH DIE STAMPED/PRESSED ELBOWS CEPTABLE. PLEATED AND ADJUSTABLE ELBOWS ARE NOT ACCEPTABLE.
- TERNALLY INSULATED SHEET METAL DUCTWORK JOINTS SHALL BE SEALED AIRTIGHT WITH AND TAPED OVER WITH DUCT TAPE. ALL INTERNALLY INSULATED SHEET METAL ORK JOINTS SHALL BE SEALED AIRTIGHT WITH MASTIC AND THE EXTERIOR SURFACE WIPED TO PROVIDE A FINISHED APPEARANCE.
- ALED DUCTWORK SHALL BE BRIGHT FINISH GALVANIZED STEEL. EXPOSED DUCTWORK SHALL NT GRIP FINISH GALVANIZED STEEL SUITABLE FOR FIELD PAINTING.
- METAL AND FLEXIBLE SUPPLY, RETURN, AND OUTDOOR AIR DUCTWORK SHALL BE
- OR AND EXTERIOR EXPOSED SUPPLY, RETURN, AND OUTDOOR AIR DUCTWORK SHALL BE AL CONSTRUCTION AND SHALL BE INTERNALLY INSULATED.
- ALED SHEET METAL AND FLEXIBLE SUPPLY, RETURN, AND OUTDOOR AIR DUCTWORK EXTERNALLY INSULATED, UNLESS INTERNALLY LINED.
- OUCT INSULATION INDICATED ON THE PLANS, SHEET METAL DUCTWORK SHALL BE INTERNALLY LINED WITH TION.
- INSTALLED IN FULLY CONDITIONED SPACES AND RETURN AIR PLENUMS WITHIN THE TED AND/OR CONDITIONED ENVELOPE, INTERNAL INSULATION SHALL BE 1" THICK UNLESS VISE SPECIFIED.
- INSTALLED IN UNCONDITIONED SPACES OUTSIDE OF THE INSULATED AND/OR CONDITIONED PPE, INTERNAL INSULATION SHALL BE 1-1/2" THICK UNLESS OTHERWISE SPECIFIED. INSTALLED EXTERIOR TO THE BUILDING ENVELOPE, INTERNAL INSULATION SHALL BE 2" UNLESS OTHERWISE SPECIFIED.
- RST 10'-0" OF RECTANGULAR/SQUARE SHEET METAL DUCT UPSTREAM OR DOWNSTREAM FAN SHALL BE INTERNALLY INSULATED WHETHER OR NOT INDICATED IN PLAN.
- RST 10'-0" OF RECTANGULAR/SQUARE SHEET METAL DUCT DOWNSTREAM OF ANY VAV HALL BE INTERNALLY INSULATED WHETHER OR NOT INDICATED IN PLAN. METAL AND FLEXIBLE SUPPLY, RETURN, AND OUTDOOR AIR DUCTWORK SHALL BE INSULATED WITH 2" THICK INSULATION (R-6.0), UNLESS INTERNALLY LINED, INCLUDING ID RETURN GRILLE COLLARS AND PANS. ALL JOINTS SHALL BE SEALED.
- INSATE PIPING WITHIN THE BUILDING ENVELOPE, INCLUDING PRIMARY AND SECONDARY LL BE INSULATED WITH 1/2" THICK PIPE INSULATION. ALL JOINTS SHALL BE SEALED. NT SUCTION PIPING LESS THAN 1-1/2" SHALL BE INSULATED WITH 1/2" THICK FLEXIBLE INSULATION. PIPING 1-1/2" OR LARGER SHALL BE INSULATED WITH 1" THICK INSULATION. SHALL BE SEALED. LIQUID LINES SHALL BE INSULATED WHEN INSTALLED WITHIN THE UNCONDITIONED SPACES OUTSIDE OF THE INSULATED AND/OR CONDITIONED ENVELOPE. EXTERIOR PIPE INSULATION SHALL BE JACKETED WITH ALUMINUM AND SEALED WEATHER
- PIPE INSULATION AT INTERIOR AREAS SHALL BE JACKETED WITH PVC INSULATION
- ATER PIPING 1-1/4" AND SMALLER SHALL BE INSULATED WITH 1-1/2" THICK PIPE ALL HOT WATER PIPING 1-1/2" AND LARGER SHALL BE INSULATED WITH 2" THICK PIPE ALL JOINTS SHALL BE SEALED.
- D WATER PIPING SHALL BE INSULATED WITH 1.5" THICK PIPE INSULATION. EXTERIOR PIPE JACKETED WITH ALUMINUM AND SEALED WEATHER TIGHT.
- CHILLED WATER PIPING SHALL BE HEAT TRACED WITH A MINIMUM OF 3 WATTS PER LINEAR PIPE
- GS, JOINTS, ELBOWS, VALVES, ETC. SHALL BE INSULATED.
- LED HYDRONIC WATER PIPING
- WING MATERIALS ARE ACCEPTABLE FOR ABOVE GROUND HOT AND CHILLED WATER PIPING: ULE 40 STEEL. MATCH EXISTING PIPE TYPE, JOINING, AND FITTING METHODS.
- CHILLED WATER PIPING, VALVES, FITTINGS, COMPONENTS, AND ACCESSORIES SHALL BE 150 PSI PRESSURE CLASS MINIMUM. VS SHALL BE LONG RADIUS TYPE.
- CONNECTIONS AT MOTORIZED EQUIPMENT SHALL HAVE BRAIDED STAINLESS STEEL CONNECTIONS.

- 1. ALL MANUAL ISOLATION VALVES SHALL BE FULL PORT BALL VALVES OR GATE VALVES FOR ALL LINE SIZES 4" OR SMALLER. BUTTERFLY VALVES MAY BE USED FOR LINES LARGER THAN 4".
- 2. ALL MODULATING, 2-WAY MOTORIZED CONTROL VALVES SHALL BE SHALL BE RATED FOR SPECIFIED FLOW AND SHALL BE NO MORE THAN ONE SIZE LESS THAN THE BRANCH LINE SIZE. VALVES SHALL HAVE INTEGRAL TEMPERATURE/PRESSURE PORTS WHEN AVAILABLE. INSTALL BALANCING VALVES AS
- DETAILED. 3. TRIPLE DUTY VALVES SHALL HAVE A MINIMUM PRESSURE DROP OF 3 FT OR LESS. G. REFRIGERANT PIPING
- 1. ALL REFRIGERANT PIPING 1-3/8" AND SMALLER SHALL BE TYPE L-ACR OR TYPE K-ACR HARD DRAWN OR SOFT (AS INDICATED) COPPER UL RATED FOR 700 PSI AT 250°F AND CONFORMING TO ASTM STANDARD B280.
- 2. ALL REFRIGERANT PIPING LARGER THAN 1-3/8" AND 2-5/8" OR LESS SHALL BE TYPE K-ACR HARD DRAWN OR SOFT (AS INDICATED) COPPER UL RATED TO 700 PSI AT 250°F AND CONFORMING TO ASTM STANDARD B280.
- 3. ALL REFRIGERANT PIPE FITTINGS SHALL BE WROT COPPER UL RATED TO 700 PSI AT 250°F AND SHALL MEET ANSI/ASME STANDARD B16.22 AND NSF 61G.
- 4. ALL STRAIGHT RUNS OF REFRIGERANT PIPING SHALL BE SLOPED 1/8" PER FOOT MIN IN THE DIRECTION OF FLOW.
- 5. IF SOFT COPPER TUBING IS USED, IT SHALL BE INSTALLED AS STRAIGHT AS POSSIBLE WITHOUT EXCESSIVE BENDS, KINKS, OR OTHER OBSTRUCTIONS.
- H. THERMOSTATS SHALL BE DIGITAL DISPLAY AND SHALL BE COMPATIBLE WITH THE CONTROL SYSTEM. LABEL ALL THERMOSTATS/WALL SENSORS TO THEIR ASSOCIATED VAV BOX.
- I. A CERTIFIED TEST AND BALANCE SHALL BE PERFORMED BY A CERTIFIED, 3RD PARTY TEST AND BALANCE COMPANY.
- 1. AIR SYSTEMS
- 1.1. INDIVIDUAL GRILLES, INLETS, AND OUTLETS SHALL BE BALANCED TO WITHIN 10% OF THE DESIGN AIR FLOWS AND UNITS AND FANS SHALL BE BALANCED TO WITHIN 5% OF THE DESIGN AIR FLOWS. THE TEST AND BALANCE SHALL INCLUDE ALL EXHAUST FANS, SUPPLY FANS, SUPPLY GRILLES, RETURN GRILLES, EXHAUST GRILLES, FAN COILS, PACKAGED ROOFTOP UNITS, AIR HANDLERS, OUTDOOR AIR INTAKES, ETC. BUILDING SHALL BE BALANCED POSITIVE OR NEUTRAL WITH ALL FANS OPERATING. NEGATIVE AIR BALANCE SHALL NOT BE ACCEPTABLE. THE TEST AND BALANCE REPORT SHALL BE PROVIDED TO THE OWNER AND THIS ENGINEER FOR REVIEW AND COMMENT
- 2. HYDRONIC SYSTEMS
- 2.1. ALL HYDRONIC SYSTEM COMPONENTS SHALL BE BALANCED TO SPECIFIED FLOWS 3. THE TEST AND BALANCE REPORT SHALL BE PROVIDED TO THE OWNER AND THIS ENGINEER FOR REVIEW AND COMMENT.
- ALL CONTROL COMPONENTS, ACCESSORIES, AND INTERCONNECTING WIRING SHALL BE PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR OR HIS CONTROLS SUBCONTRACTOR EXCEPT THAT ALL ASSOCIATED SMOKE AND FIRE ALARM WIRING SHALL BE PROVIDED AND INSTALLED BY THE FIRE ALARM CONTRACTOR. 120V POWER SHALL BE BROUGHT TO CONTROL COMPONENTS AS NECESSARY BY THE ELECTRICAL CONTRACTOR. COORDINATE ALL WORK WITH THE ELECTRICAL AND FIRE ALARM CONTRACTORS.
- K. ALL LINE VOLTAGE (120V, 240V, 460V, ETC.) CONTROLS (SWITCHES, TIME CLOCKS, ETC.), ACCESSORIES, AND INTERCONNECTING WIRING SHALL BE PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR EXCEPT THAT ALL DAMPER ACTUATORS SHALL BE PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR OR HIS CONTROLS SUBCONTRACTOR. ALL LOW VOLTAGE (24V, ETC.) CONTROLS (THERMOSTATS, ETC.), ACCESSORIES, AND INTERCONNECTING WIRING SHALL BE PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR EXCEPT THAT ALL ASSOCIATED SMOKE AND FIRE ALARM WIRING SHALL
- BE PROVIDED AND INSTALLED BY THE FIRE ALARM CONTRACTOR. COORDINATE ALL WORK WITH THE ELECTRICAL AND FIRE ALARM CONTRACTORS.
- REFRIGERANT SYSTEM TESTS
- 1. PRESSURE TEST
- a. INTERCONNECTING PIPING
- a.1. EVACUATE ALL REFRIGERANT FROM THE SYSTEM.
- a.2. ISOLATE THE COMPONENT INTERCONNECTING PIPING AND CHARGE WITH DRY, OXYGEN FREE
- LOCATE AND REPAIR LEAKS AND REPEAT TEST PROCEDURE. b. ENTIRE SYSTEM
- b.1. EVACUATE ALL REFRIGERANT FROM THE SYSTEM.
- b.2. CHARGE SYSTEM WITH DRY OFN TO THE MAXIMUM ALLOWABLE PRESSURE OF THE SYSTEM COMPONENTS. MAINTAIN PRESSURE FOR 12 HOURS. IF LOSS OF PRESSURE OCCURS, LOCATE AND REPAIR LEAKS AND REPEAT TEST PROCEDURE. 2. VACUUM TEST
- a. FOLLOWING SUCCESSFUL PRESSURE TESTING, EVACUATE THE SYSTEM TO 1500 MICRON. BREAK THE VACUUM WITH DRY OFN TO 1 BAR. REPEAT ONCE.
- b. CONTINUOUSLY EVACUATE THE SYSTEM TO BETWEEN 300 MICRON AND 500 MICRON FOR A MINIMUM OF 1 HOUR. INSPECT VACUUM PUMP FOR SIGNS OF MOISTURE DISCHARGE. CONTINUE EVACUATION AND INSPECT AT 1 HOUR INTERVALS UNTIL MOISTURE IS NOT PRESENT.
- c. MAINTAIN VACUUM FOR FOR 12 HOURS. IF LOSS OF VACUUM OCCURS, REPEAT TEST PROCEDURE. 3. FOLLOWING SUCCESSFUL PRESSURE AND VACUUM TESTING, CHARGE SYSTEM WITH NEW REFRIGERANT.
- RECOVERED, RECYCLED, OR RECLAIMED REFRIGERANT SHALL BE TREATED TO REMOVE MOISTURE, OIL, ACID, AND PARTICULATE MATTER PRIOR TO USE.
- 4. DOCUMENT TESTING AND PROVIDE TO OWNER. INSPECTION BY LOCAL AUTHORITY MAY BE REQUIRED. M. CONDENSATE PIPING
- 1. ALL CONDENSATE PIPING SHALL BE PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR. 2. MATERIAL
- a. INTERIOR CONDENSATE PIPING SHALL BE APPROVED, SCHEDULE 40 PVC WITH PVC FITTINGS AND SOLVENT CEMENT JOINTS UNLESS OTHERWISE NOTED.
- 3. SIZING-CONNECTED LOAD
- a. 2 TONS OR LESS=3/4"
- b. MORE THAN 2 TONS TO 5 TONS=1"
- c. MORE THAN 5 TONS TO 30 TONS=1-1/4"
- d. MORE THAN 30 TONS TO 50 TONS=1-1/2" e. MORE THAN 50 TONS TO 170 TONS=2"
- 4. MINIMUM SLOPE
- a. 2-1/2" OR LESS=1/4" PER FOOT
- N. DUCT ACCESS DOORS SHALL BE GASKETED.
- O. ALL PIPING SHALL BE LABELED IN ACCORDANCE WITH ASTM STANDARD A13.1. INSULATED PIPE AND DUCT SHALL BE LABELED. BARE OR PAINTED PIPE AND DUCT SHALL BE STENCILED. LABELS OR STENCILS SHALL INCLUDE SERVICE (REFRIGERANT SUCTION, REFRIGERANT LIQUID, CONDENSATE. OUTDOOR AIR, EXHAUST, SUPPLY AIR, CHILLED WATER SUPPLY, CHILLED WATER RETURN, HYDRONIC HOT WATER SUPPLY, HYDRONIC HOT WATER RETURN, ETC.), SIZE, AND DIRECTION OF FLOW.
- P. COORDINATE ALL REQUIRED WALL, FLOOR, CEILING, AND ROOF PENETRATION LOCATIONS AND SIZES WITH THE GC PRIOR TO CONSTRUCTION. GC SHALL PROVIDE ALL REQUIRED FRAMED OPENINGS, HEADERS, MASONRY OPENINGS, LINTELS, ETC. AS NECESSARY.
- Q. COORDINATE ALL DUCT LOCATIONS, SIZES, AND ROUTING WITH GC PRIOR TO CONSTRUCTION. GC SHALL PROVIDE A CLEAR PATH THROUGH FRAMING AND MASONRY COMPONENTS TO ACCOMMODATE DUCT ROUTING.

NITROGEN (OFN) TO 1.3 TIMES THE MAXIMUM ALLOWABLE PRESSURE OF THE SYSTEM COMPONENTS. MAINTAIN PRESSURE FOR 12 HOURS. IF LOSS OF PRESSURE OCCURS,

R. ALL VOLUME DAMPERS ABOVE INACCESSIBLE CEILINGS (GYPSUM, ETC.) SHALL BE YOUNG REGULATOR MODEL 5020CC (ROUND) OR MODEL 830 ACC (RECTANGULAR) WITH MODEL 270-315 CABLE CONTROLLER WITH CONCEALED CEILING REGULATOR WITH ADJUSTABLE COVER. REGULATOR SHALL BE CENTERED IN THE CEILING AND/OR ALIGNED WITH LIGHTS.

S. PIPE PRESSURE TESTING 1. HOT OR CHILLED WATER PIPING

- a. ALL SYSTEM PIPES AND JOINTS SHALL BE TESTED PRIOR TO INSULATION.
- b. ISOLATE PORTION OF SYSTEM TO BE TESTED WITH SHUTOFF VALVES AND/OR CAPS.
- c. FILL SYSTEM WITH AIR (FOR PIPE OTHER THAN PLASTIC) OR WATER (FOR PLASTIC PIPE) TO A PRESSURE OF 225 PSI. MAINTAIN PRESSURE FOR 12 HOURS.
- d. FOLLOW MANUFACTURER'S TEST PROCEDURE IF POLYPROPYLENE PIPE OR MANUFACTURED MECHANICAL FITTINGS ARE USED.
- e. IF LOSS OF PRESSURE OCCURS, LOCATE AND REPAIR LEAKS AND REPEAT TEST PROCEDURE.
- f. DOCUMENT TEST AND PROVIDE TO OWNER. INSPECTION BY LOCAL AUTHORITY MAY BE REQUIRED.
- WATER SYSTEMS SHALL BE FLUSHED WITH CLEAN POTABLE WATER PRIOR TO SYSTEM START UP. FOLLOWING SYSTEM START UP BUT PRIOR TO TESTING AND BALANCING, ALL STRAINERS AND FILTERS SHALL BE FLUSHED AND CLEANED SO THEY ARE FREE OF DEBRIS. ENSURE THAT ALL COILS, PUMPS, EQUIPMENT, ETC. HAVE HAD FULL WATER FLOW PRIOR TO STRAINER/FILTER BLOW DOWN.

U. A QUALIFIED WATER TREATMENT SPECIALIST SHALL TEST AND TREAT ALL CHILLED AND HEATING HOT WATER SYSTEMS PRIOR TO SYSTEM TURN OVER TO OWNER TO PREVENT SCALE, BIOLOGICAL CONTAMINANTS, ETC.. CHEMICALS AND CONCENTRATIONS USED SHALL BE COMPATIBLE WITH PIPING AND EQUIPMENT MATERIALS.

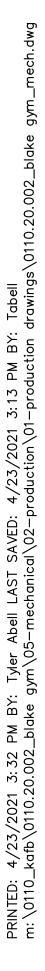
- V. ALL MOTOR OR COMPRESSOR DRIVEN EQUIPMENT SHALL BE MOUNTED ON OR FROM VIBRATION ISOLATION. EQUIPMENT MOUNTED DIRECTLY OR INDIRECTLY ON OR FROM THE GROUND FLOOR SLAB SHALL BE MOUNTED ON NEOPRENE IN SHEAR ISOLATION. ALL EQUIPMENT MOUNTED ABOVE THE GROUND FLOOR SLAB (I.E. CEILING/ROOF SUSPENDED, MOUNTED ON SECOND FLOOR, MOUNTED ON MEZZANINE, ETC.) SHALL BE MOUNTED ON OR FROM SPRING VIBRATION ISOLATION.
- W. LARGE EQUIPMENT SHALL BE SHIPPED FROM THE FACTORY IN SECTIONS SMALL ENOUGH TO FIT THROUGH ALL OPENINGS REQUIRED FOR INSTALLATION. BREAKDOWN OF EQUIPMENT ON SITE SHALL NOT BE PERMITTED. EQUIPMENT SHALL BE PROVIDED WITH DETAILED FACTORY PROVIDED INSTRUCTIONS FOR REASSEMBLY AND CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS, MATERIALS, WORKMANSHIP, ETC. COORDINATE WITH EQUIPMENT MANUFACTURERS, ARCHITECTURAL PLANS, AND WITH GC. REASSEMBLY OF EQUIPMENT SHALL BE PART OF THIS CONTRACT AND NO CHANGE ORDERS SHALL BE ALLOWED FOR FAILURE TO COMPLY WITH THIS SECTION.
- X. ALL DUCT AND EQUIPMENT SUPPORTS SHALL BE PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
- Y. EXTERIOR DUCTWORK SHALL BE PAINTED WITH A RUST PREVENTATIVE PRIMER AND TWO TOPCOATS OF FINISH PAINT. ROOFTOP DUCTWORK SHALL BE PAINTED BRIGHT WHITE.
- Z. EXTERIOR DUCTWORK SHALL BE SLOPED SO THAT WATER DOES NOT STAND ON DUCT.
- AA. PIPE SUPPORT SPACING
- 1. METAL PIPING
- a. PIPE SIZE: 1/2 INCHES TO 1-1/4 INCHES
- a.1. MAXIMUM SUPPORT SPACING: 6 FT
- a.2. HANGER ROD DIAMETER: 3/8 INCHES
- b. PIPE SIZE: 1-1/2 INCHES TO 2 INCHES
- b.1. MAXIMUM SUPPORT SPACING: 10 FT
- b.2. HANGER ROD DIAMETER: 3/8 INCH
- c. PIPE SIZE: 2-1/2 INCHES TO 3 INCHES
- c.1. MAXIMUM SUPPORT SPACING: 10 FT c.2. HANGER ROD DIAMETER: 1/2 INCH
- d. PIPE SIZE: 4 INCHES TO 6 INCHES
- d.1. MAXIMUM SUPPORT SPACING: 10 FT
- d.2. HANGER ROD DIAMETER: 5/8 INCH
- 2. PLASTIC PIPING
- a. ALL SIZES
- a.1. MAXIMUM SUPPORT SPACING: 6 FT
- a.2. HANGER ROD DIAMETER: 3/8 INCH
- AB. IF SUPPORTING MULTIPLE PIPES, THE SMALLEST PIPE/MOST STRINGENT PIPE SUPPORT SPACING SHALL BE USED FOR THE ENTIRE ASSEMBLY.
- AC. ALL VALVES SHALL SHALL BE FULL PORT
- AD. ALL PIPING, VALVES, ETC. INSTALLED IN WALLS OR IN AREAS NOT READILY ACCESSIBLE SHALL HAVE
- ACCESS PANELS FOR MAINTENANCE
- AE. ALL TAGS (VALVES, PIPES, ETC.) SHALL HAVE SOLID BRASS CHAINS. AF. ALL PIPE HANGERS. PIPE SUPPORTS, FLANGES, ETC. SHALL BE SECURED PER MANUFACTURERS TORQUE SPECIFICATIONS. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO VERIFY ALL ITEMS HAVE BEEN TIGHTENED PROPERLY.
- AG. ALL DUCTS SHALL BE SUPPORTED AT A MAXIMUM OF 12'-0" ON CENTER.

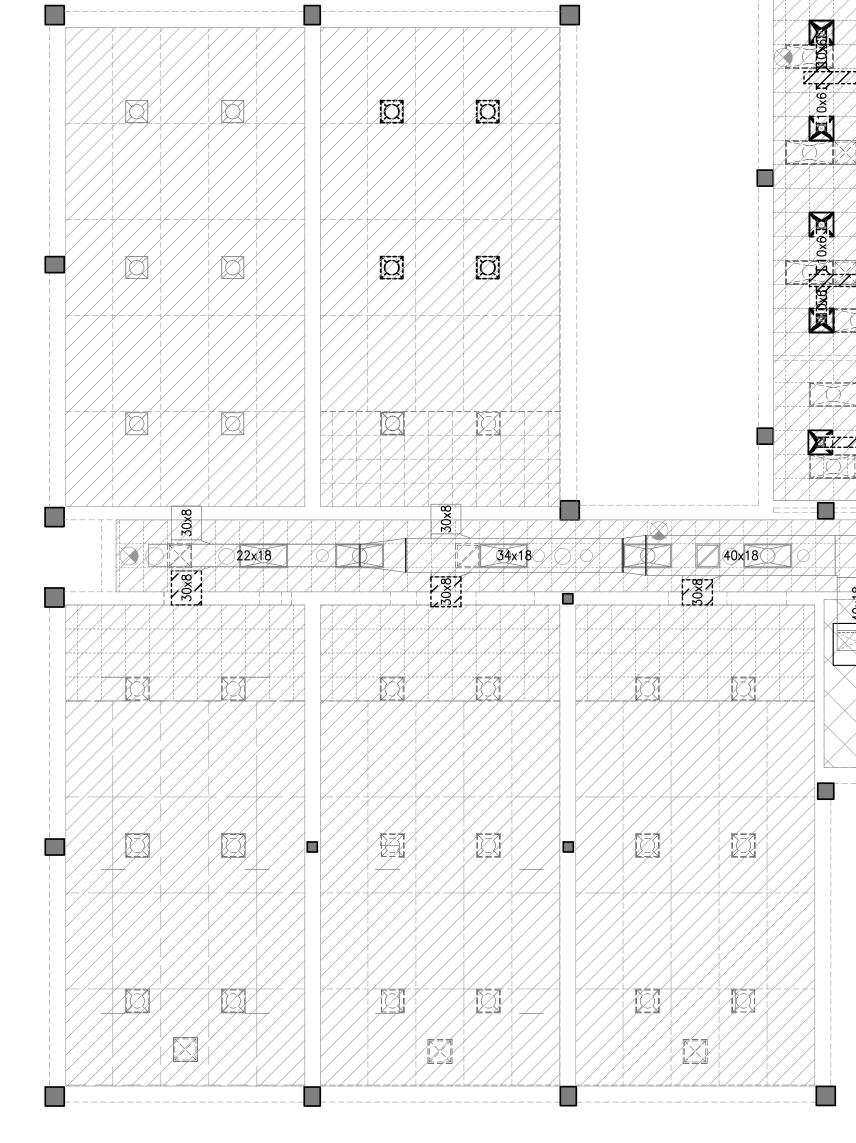


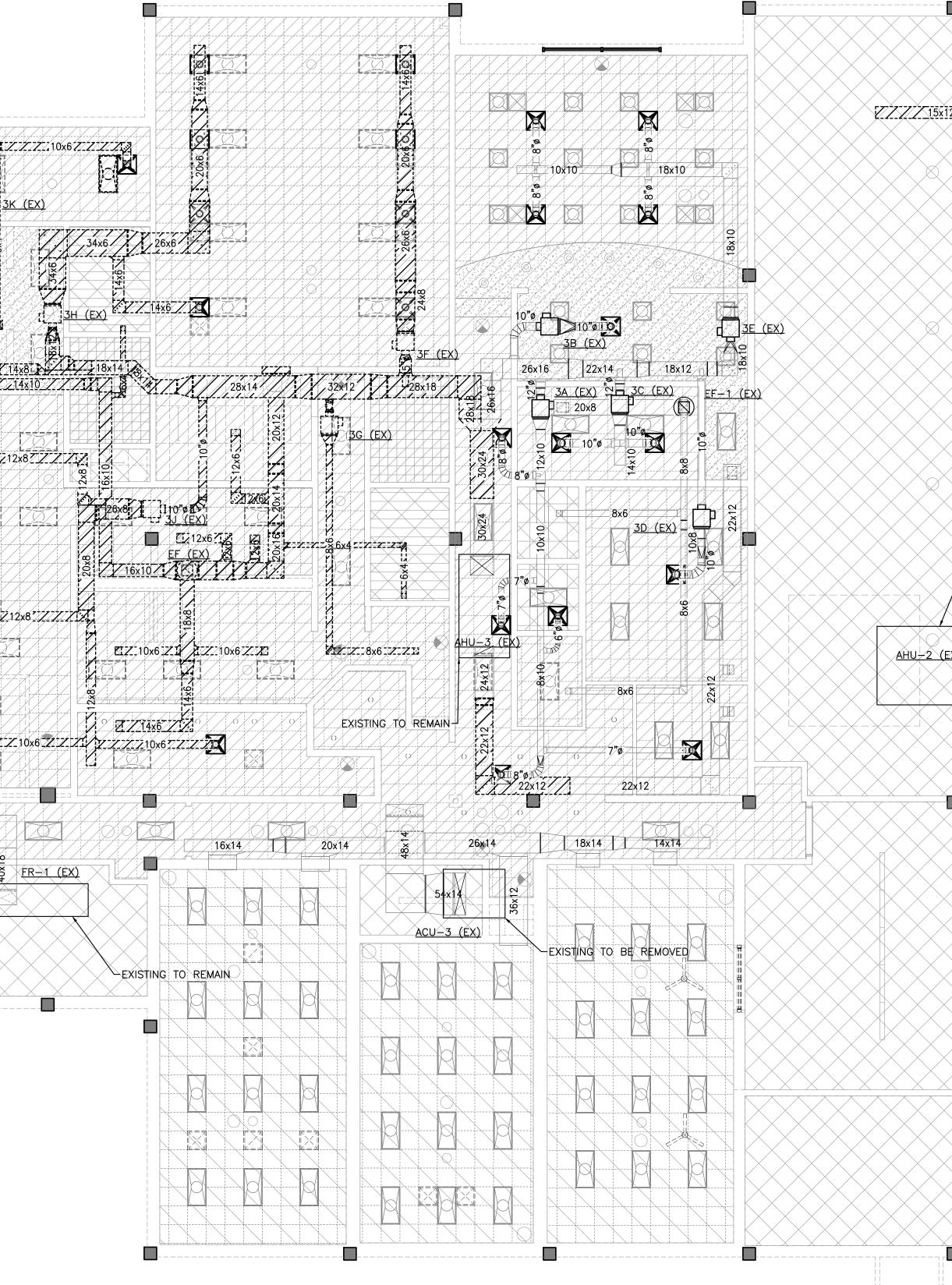
	HVAC. ARF	BREVIATIONS		
	Α			
Α	AMPS	LBS	c	POUNDS
A	AIR CONDITIONING			
AC	ABOVE FINISHED FLOOR			Μ
AHU	AIR HANDLING UNIT	MAX		IAXIMUM
All	ALUMINUM	MBH		DNE THOUSAND BRITISH THERMAL UNITS PER HOUR
		MC		IECHANICAL CONTRACTOR
	В	MCA		MINIMUM CIRCUIT AMPACITY
BDD	BACKDRAFT DAMPER	MD		NOTORIZED DAMPER
BOD	BOTTOM OF DUCT	MIN		ИІЛІМИМ
	С	MOCP	<u>'</u> N	AXIMUM OVERCURRENT PROTECTION
CEF	CEILING EXHAUST FAN			Ν
CFH	CUBIC FEET PER HOUR	NC/PC	א <u>כ</u>	NORMALLY CLOSED/POWERED OPEN
CFM	CUBIC FEET PER MINUTE	NIC		NOT IN CONTRACT
CHW	CHILLED WATER	NIS	N	NEOPRENE IN SHEAR
CHWR	CHILLED WATER RETURN	N0/PC	C N	NORMALLY OPEN/POWERED CLOSED
CHWS	CHILLED WATER SUPPLY	NTS	N	NOT TO SCALE
CU	CONDENSING UNIT		I	0
CW	CONDENSER WATER	AO	C	DUTDOOR AIR
CWS	CONDENSER WATER SUPPLY	00		DN CENTER
CWR	CONDENSER WATER RETURN			P
	D		r	
DC	DIRECT CURRENT	PC		PLUMBING CONTRACTOR
	E	PH	P	PHASE
E	EXISTING			R
EA	EXHAUST AIR	RA		RETURN AIR
EC	ELECTRICAL CONTRACTOR	RGS		RIGID SEALED
EF	EXHAUST FAN	RIS		RUBBER IN SHEAR
ESP	EXTERNAL STATIC PRESSURE	RPM	R	REVOLUTIONS PER MINUTE
	F			S
FC	FAN COIL	SA		SUPPLY AIR
FD	FIRE DAMPER	SQFT	S	SQUARE FEET
FSD	COMBINATION FIRE/SMOKE DAMPER			Т
FT	FOOT/FEET	TSP	Т	FOTAL STATIC PRESSURE
	G	TYP	T	TYPICAL
GA	GAUGE			U
GA	GAUGE GENERAL CONTRACTOR	UC		JNDERCUT DOOR
GC	GLASS FABRIC AND MASTIC	UL		INDERWRITERS LABORATORIES
			I	V
		V	\	V /OLTAGE
HP	HORSEPOWER OR HEAT PUMP	VD		/OLUME DAMPER
HW	HOT WATER	VIF		/ERIFY IN FIELD
HWR HWS	HOT WATER RETURN HOT WATER SUPPLY			W
		W		VV NATT
	K	VV I	V	
KW	KILOWATT	WC	14	NATER COLUMN

	HVAC SYMBOLS
	SQUARE/RECTANGULAR SUPPLY DOWN
	SQUARE/RECTANGULAR SUPPLY UP
	ROUND SUPPLY DOWN
	ROUND SUPPLY UP
	SQUARE/RECTANGULAR RETURN DOWN
	SQUARE/RECTANGULAR RETURN UP
	ROUND RETURN DOWN
	ROUND RETURN UP
	SQUARE/RECTANGULAR EXHAUST DOWN
	SQUARE/RECTANGULAR EXHAUST UP
	ROUND EXHAUST DOWN
	ROUND EXHAUST UP
	SQUARE/RECTANGULAR ELBOW
	SQUARE/RECTANGULAR ELBOW WITH TURNING VANES
	ROUND MAIN WITH CONICAL TAKEOFF
	ROUND MAIN WITH CONICAL TEE
	SQUARE/RECTANGULAR MAIN WITH CONICAL TEE
	ROUND MAIN WITH 45° LATERAL WYE
	SQUARE/RECTANGULAR MAIN WITH 45° LEAD IN TAKEOFF
	ROUND ELBOW
	EXISTING DUCT TO BE REMOVED
	EXISTING DUCT TO REMAIN
	MANUAL VOLUME DAMPER
	SQUARE/RECTANGULAR TO ROUND TRANSITION
	CONCENTRIC TRANSITION
	ECCENTRIC TRANSITION
	ROUND NECK CEILING AIR TERMINAL
	SQUARE/RECTANGULAR NECK CEILING AIR TERMINAL
	TRANSFER AIR PATH
Ç	TIMECLOCK
ф	THERMOSTAT
\$	TEMPERATURE SENSOR
(F)	HUMIDITY SENSOR
sd	DUCT SMOKE DETECTOR
	CONNECT TO EXISTING
\$	SWITCH
MD	MOTORIZED DAMPER
FD	FIRE DAMPER
FSD	COMBINATION FIRE/SMOKE DAMPER
SD	SMOKE DAMPER
BDD	BACKDRAFT DAMPER
	CAP AND SEAL
	FLEXIBLE CONNECTION
	1









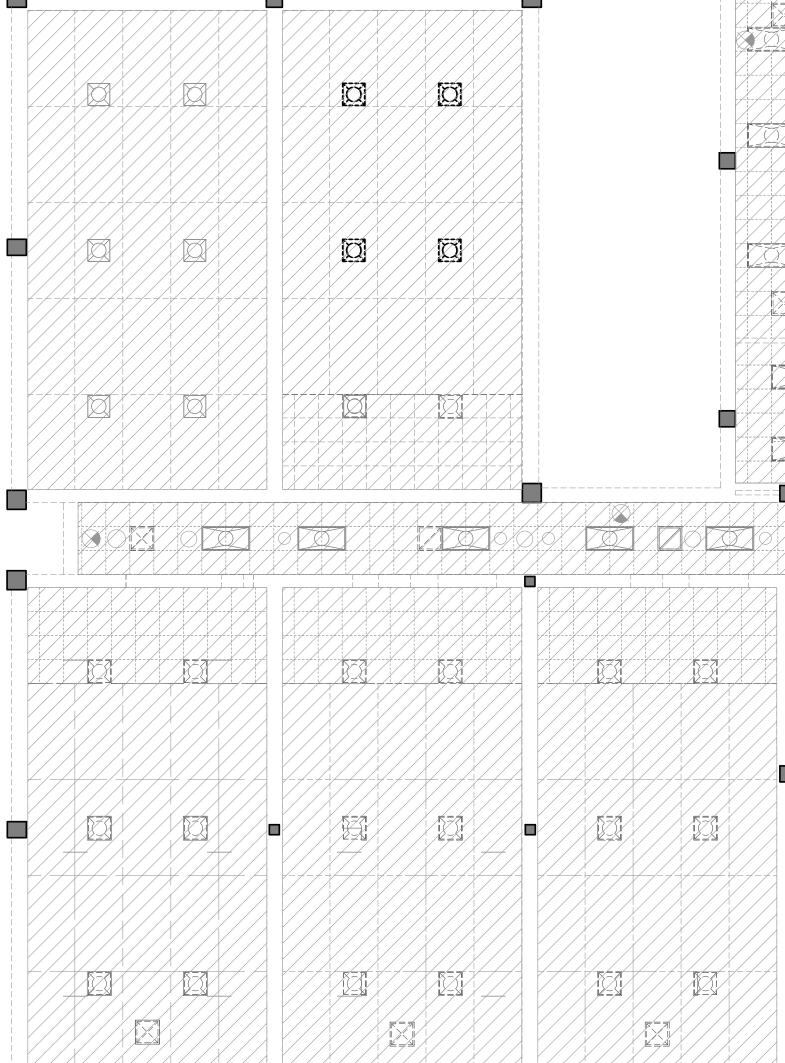
1 MECHANICAL HVAC DEMOLITION PLAN SCALE: 1/8"=1-0"

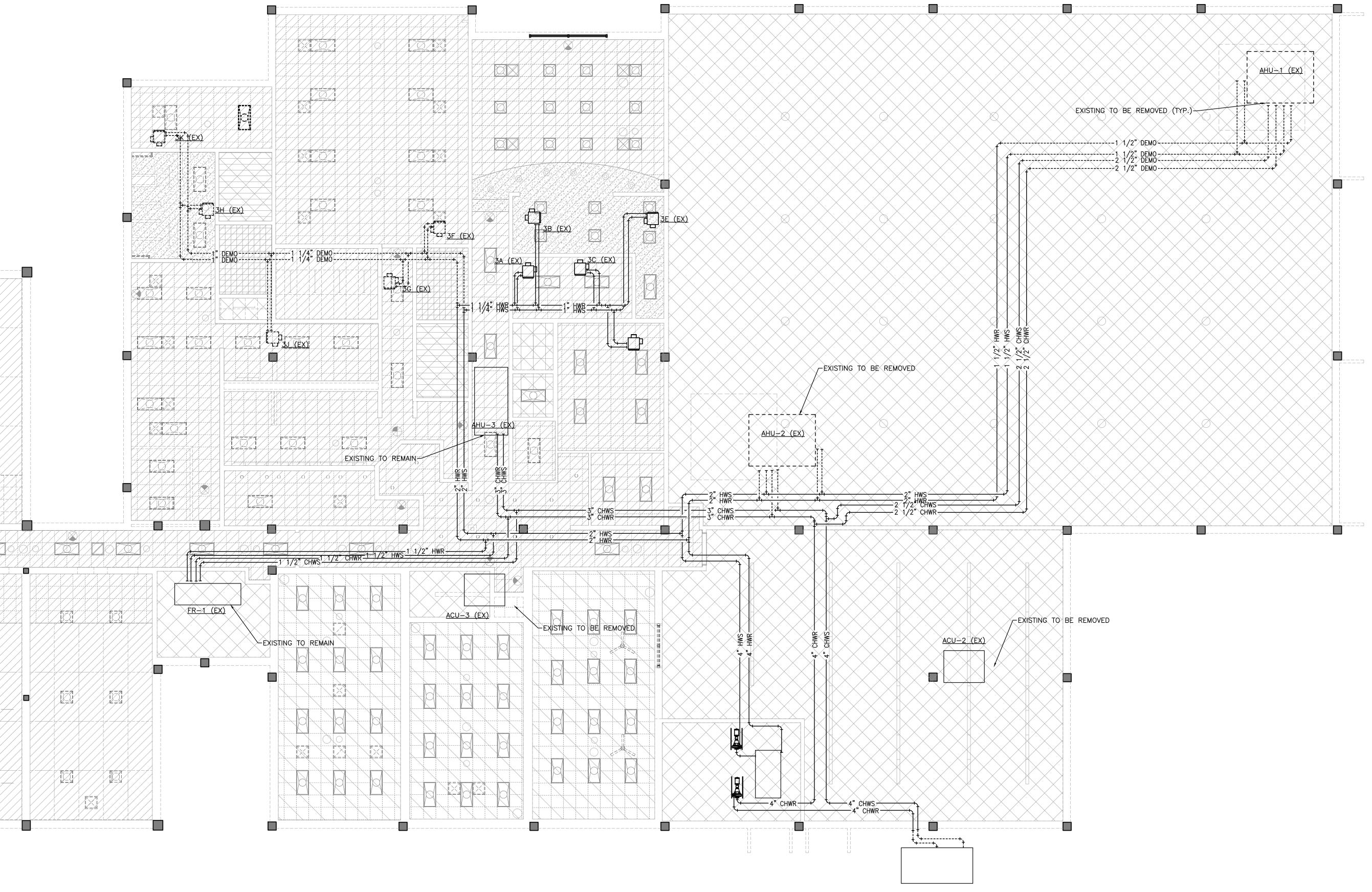
<u>AHU-2</u>

5x12//	<u>TYX////////////////////////////////////</u>
	EXISTING TO BE REMOVED (TYP.)
	VISTING TO BE REMOVED
(EX)	AHU LOCATED ON PLATFORM (TYP.) 40x16 32x16 30x14 22x14 15x12
	-EXISTING TO REMAIN (TYP.)
	-EXISTING TO BE REMOVED



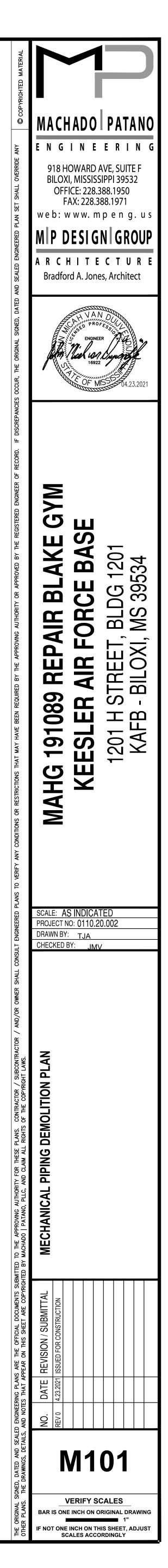


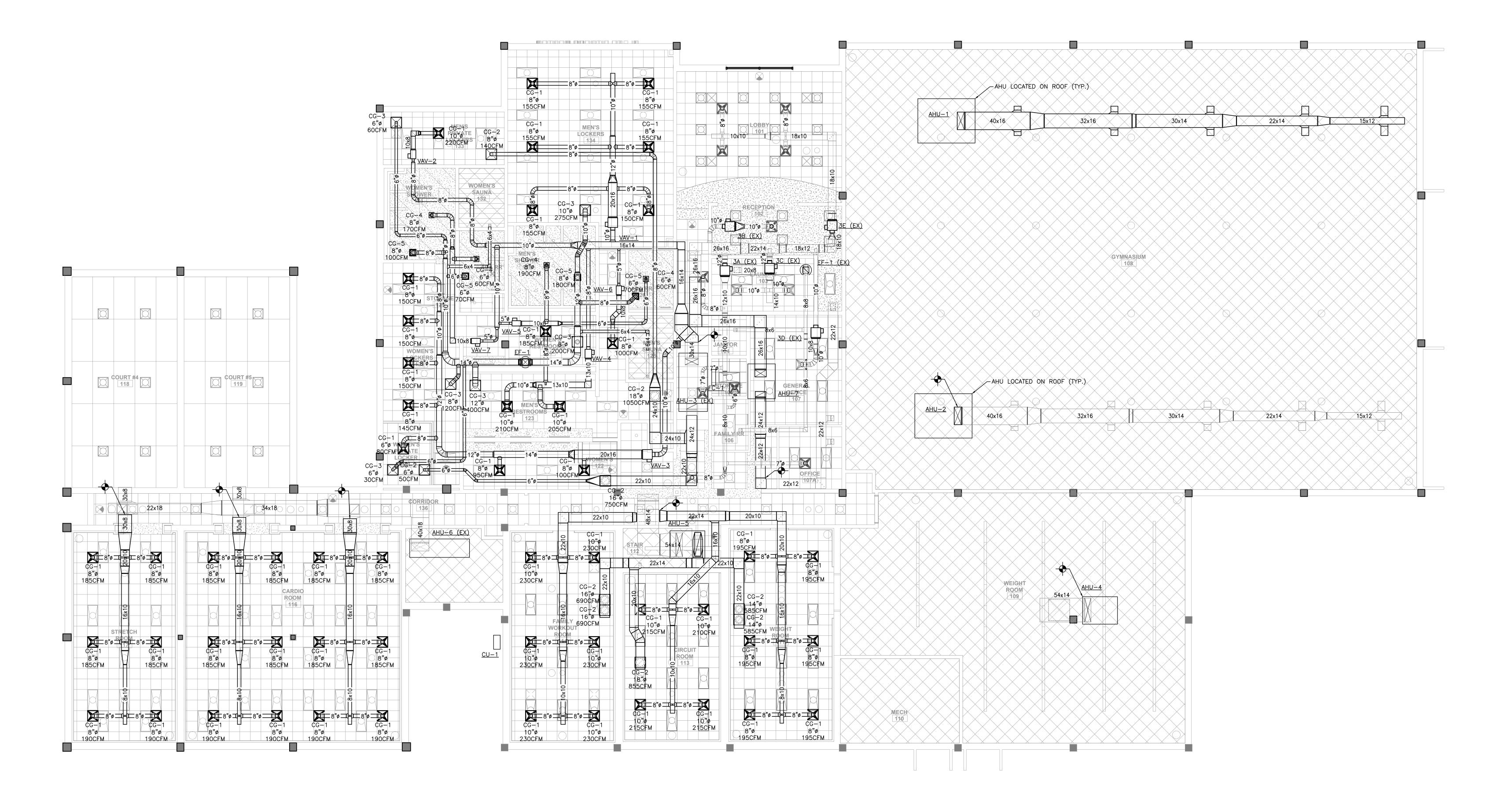




1 MECHANICAL PIPING DEMOLITION PLAN SCALE: 1/8"=1'-0"





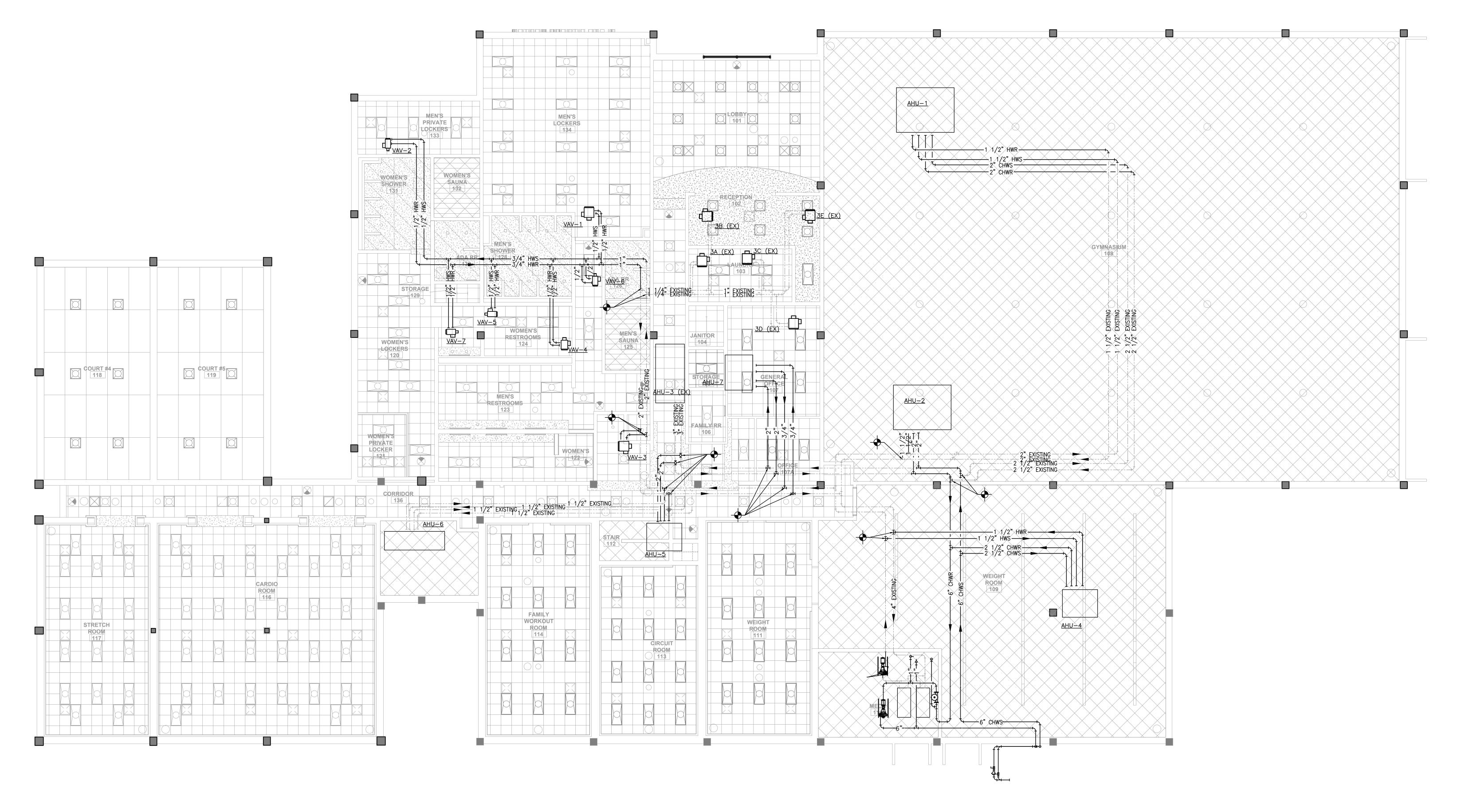


1 MECHANICAL HVAC PLAN SCALE: 1/8"=1'-0"

AN

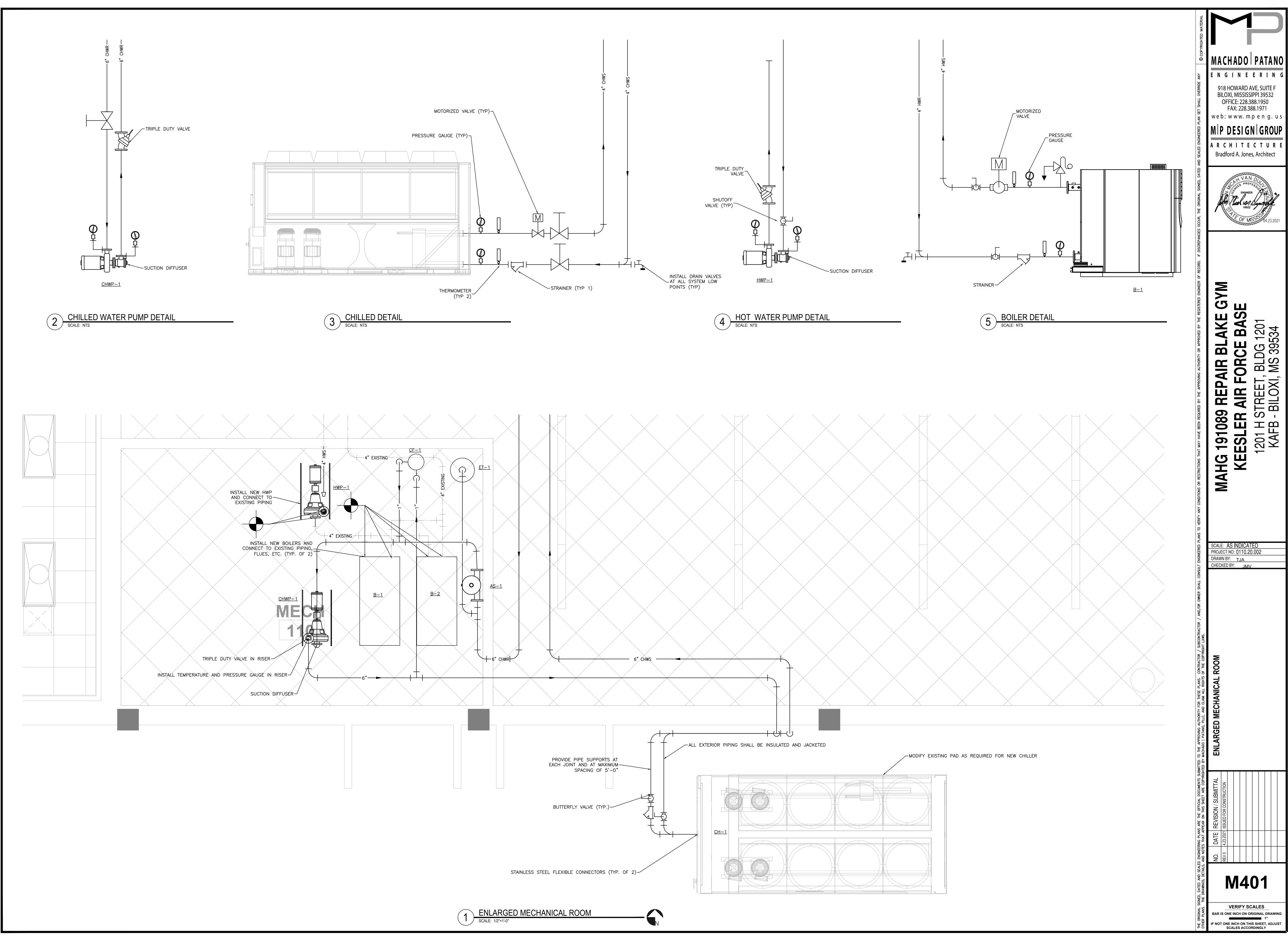
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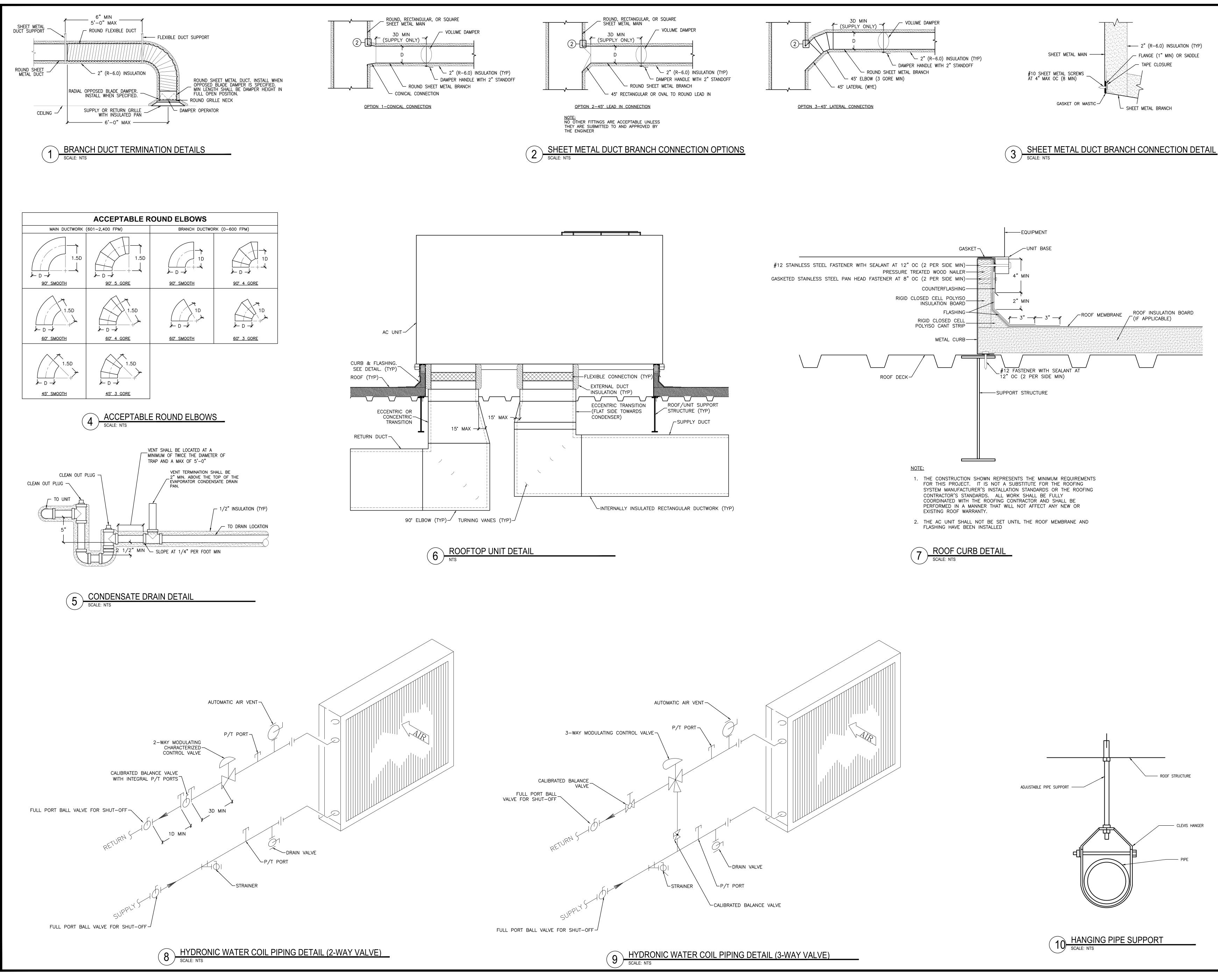




1 MECHANICAL PIPING PLAN SCALE: 1/8"=1'-0"









							CHIL	LER SCHEDU	LE							
TAG	MAKE	MODEL	TONNAGE	EWT (°F)	LWT (°F)	DESIGN GPM	MIN FLOW	PD (FT)	V/PH	FAN FLA	COMPRESSOR RLA	COMPRESSOR LRA	MCA	MOCP	LBS	NOTE
CH-1	TRANE	RTAC-155	155	54	44	366.2	193.0	13.3	460/3	(9) 2.7	139 & 118	878 & 774	318	400	11150	1,3,4,5,6,7,8,9
1 1	WITH LOW AMBIENT (CONTROLS FOR OPERATION TO	0°F							2	WITH FACTORY MOUNTED ACROSS TH	IF LINE STARTER			<u> </u>	

I WITH LOW AMBIENT CONTROLS FOR OPERATION TO OF

3 WITH SINGLE POINT ELECTRICAL CONNECTION

5 WITH 5 YEAR PARTS AND LABOR WARRANTY

7 WITH SEMI-HERMETIC SCREW COMPRESSORS (TOTAL TWO COMPRESSORS)

9 COIL SHALL BE MADE OF 9153 ALUMINUM ALLOY

11 SYSTEM SHALL HAVE WEATHERPROOF CONTROL PANEL. CONTROL PANEL SHALL FULLY INTEGRATE INTO CONTROL SYSTEM.

													AIR HAND	LING UNIT	SCHEE	DULE																		
		AIRFLOW	OA	ESP				CHILLED WATER COIL								PRE-HEAT COIL				RE-HEAT WATER COIL														
TAG MAKE	MODEL	(CFM)	(CFM)	(INWC)	RPM	TOTAL (MBH)			EWB (°F)		EWT (°F)	LWT (°F)	WPD (FTWC)	VELOCITY (FPS)	FPI	TOTAL (MBH)	FLOW (GPM)	EDB LI (°F) (°		T LWT T) (°F) (DB EW F) (°F		V EWT I) (°F)	LWT (°F)	WPD (FTWC)	VELOCITY (FPS)	FPI	V/PH	HP FL	_A MCA	MOCP	LBS	NOTES
AHU-1 TRANE	UCCAG10C1F0RMB32000000FE878BA0000D000BD0	5100	600	4.181	2337	188.27	121.98	74.7	65.2	37.23	44	54	4.04	2.86	12	-	_	-		-	221.24	55 95	23.37	180	161	6.48	5.39	12	460/3	7.5 1	11 13.75	20	2475 1	2,3,4,5,6,7,8,9,10,11,12,13
AHU-2 TRANE	UCCAG10C1F0RMB32000000FE878BA0000D000BD0	5100	600	4.181	2337	188.27	121.98	74.7	65.2	37.23	44	54	4.04	2.86	12	-	_	-		-	221.24	55 95	23.37	180	161	6.48	5.39	12	460/3	7.5 11	11 13.75	20	2475 1	2,3,4,5,6,7,8,9,10,11,12,13
AHU-3 (EX) TEMTROL	ITF-RDH18	6730	5000	3.7	-	481.834	186.6	87.7	75.1	96.4	45	55	-	-	-	101.54	10.2	41.5 5	5.5 180	160	-	- -	-	_	-	-	_	_	460/3	30 E	ў —	-	-	-
AHU-4 TRANE	UCCAG10C1F0RLB32000000EE865BA0000D000BD0	4000	295	3.287	1946	135.59	90.75	73.6	64.2	30.11	44	54	2.77	2.32	9	_	_	-		-	173.52	55 95	10.77	180	147	1.52	2.48	12	460/3	5 7.6	.6 9.5	15	1675 1,	2,3,4,5,6,7,8,9,10,11,12,13
AHU-5 TRANE	UCCAG10C1F0RLB32000000EE865BA0000D000BD0	4000	395	3.293	1948	143.62	93.44	74.2	64.8	31.84	44	54	3.06	2.45	9	-	-	-		-	173.52	55 95	10.77	180	147	1.52	2.48	12	460/3	5 7.6	.6 9.5	15	1675 1,	2,3,4,5,6,7,8,9,10,11,12,13
AHU–6 (EX) YORK	XTI-036X063-BAHA046A	5600	_	-	_	202	137	-	_	40	44	54	-	_	-	-	_	-		-	-		_	_	-	-	_	_	460/3	5 7	/ _	-	-	-
AHU-7 TRANE	UCCAJ08C1F0RAM3200000DDY00BA0000DD00BD0	2940	960	3.347	1555	151.24	85.85	79.4	69.3	31.76	44	54	2.6	2.44	12	63.77000000	2.13	45 (65 180	160	-		-	-	-	-	_	-	460/3	3 5.0	.02 6.22	15	1385 1	2,3,4,5,6,7,8,9,10,11,12,13
1 WITH 2" DO	, OUBLE WALL, FOAM INJECTED (R-13), THERMALLY BROKEN, GALVANIZED C	CASING PANELS		1	I		1		11		I	2	WITH 2.5" INTE	GRAL BASE FRAME			1	1 1		I I		1	1				1				I	<u> </u>	I	

ED (R-13), IF

3 WITH 2" MERV 8 FILTERS

5 WITH VERTICAL CONFIGURATION

7 WITH INVERTER DUTY MOTOR WITH SHAFT GROUNDING

9 WITH TOP SUPPLY

11 MOUNT ON NIS VIBRATION ISOLATION. FAN SHALL BE SPRING ISOLATED.

13 WITH ROOF CURB

								VAV SO	CHEDUL	E													EXPANS		IK SCHEDU	ILE		
T 1 0					INLET	TOTAL PD	MIN/HEATING					HOT WATE	ER COIL						TAG	MAK	(E	MODEL	TANK	(GAL)	ACCEPTA	NCE (GAL)	LBS	NOTES
TAG	MAKE	MODEL	INLET SIZE	MAX CFM	PRESSURE (IN WC)	(IN)	CFM	1	ROWS	GPM E	RANCH (IN)	EAT (°F)	LAT (°F)	EWT (°F)	LWT (°F)	WPD (FT)	LBS	NOTES	ET-1	WESSE	ELS	NTA-20		11	8	3.8	55	1,2,3
VAV-1	TRANE	VCWF	10	925	1.0	0.18	275	19.95	1	1.27	3/4	55	95	180	160	4.65	30	1,2,3,4,5,7,8		1 TANK SHAI	LL BE FULLY	INSULATED				2	PROVIDED AND INS	TALLED BY MC
VAV-2	TRANE	VCWF	5	220	1.0	0.070	115	6.41	1	0.50	1/2	55	108.73	180	160	0.50	20	1,2,3,4,5,6,8		3 125 PSI R	RATING							
VAV-3	TRANE	VCWF	10	850	1.0	0.16	195	11.14	1	0.5	1/2	55	107.68	180	160	0.92	30	1,2,3,4,5,6,8										
VAV-4	TRANE	VCWF	8	600	1.0	0.38	600	26.03	2	1.49	3/4	55	95	180	160	0.19	25	1,2,3,4,5,6,8										
VAV-5	TRANE	VCWF	5	250	1.0	0.08	250	10.85	1	1.18	3/4	55	95	180	160	2.23	20	1,2,3,4,5,6,8		1			AIR SE	PARATO	DR SCHEDI	JLE		
VAV-6	TRANE	VCWF	4	100	1.0	0.03	50	4.44	1	0.50	1/2	55	136.9	180	160	0.49	20	1,2,3,4,5,6,8	TAG	MAK	(E	MODEL	CONNE	CTIONS	GPM PD (FT) WE	EIGHT (LBS)	NOT
VAV-7	TRANE	VCWF	5	230	1.0	0.07	170	7.69	1	0.50	1/2	55	96.73	180	160	0.5	20	1,2,3,4,5,6,8	AS-1	TACC	o l	ACT06-125	6,	"	366 0.3		185	1,2
VAV-3A (EX)	-	-	9	590	-	0.50	-	16.44	-	1.6	3/4	55	80	180	160	-	-	-		1 WITH AUTC)MATIC AIR VE	ENT				2 WITH FLUSH	I VALVE	
VAV-3B (EX)	-	-	7	360	-	0.50	_	10.03	-	1.0	1/2	55	80	180	160	_	-	-		3 125 PSI R	RATING							
VAV-3C (EX)	-	-	10	700	-	0.50	-	19.5	-	2.0	3/4	55	80	180	160	_	-	-										
VAV-3D (EX)	-	-	6	290	-	0.50	_	8.08	-	0.8	1/2	55	80	180	160	-	-	-										
VAV-3E (EX)	-	-	12	1000	-	0.50	_	29.4	-	2.9	1/2	55	81.4	180	160	_	-	-		I	CH	HEMICAL			JLE			
	1 WITH 1" INSUL						_			ITH HOT WATER									TAG	MAK	Έ	MODEL	TANK	(GAL)	LBS	NOTES		
			JATOR SHALL BE PRO								APACITY COILS AND/C								CF-1	WESSE	ELS	CPFT-5		5	35	1		
) INSTALLED PIPING P.	,	,		DETAILS				ARACTERIZED CONTRO									1 125PSI RA	TING							
	' WITH 3-WAY (CONTROL VALVE	PROVIDED BY CONTR	OLS CONTRACTOR A	ND FACTORY INSTAL	LED			8 C	OORDINATE RIG	IT OR LEFT HAND PI	PING/CONTROLS V	WITH INSTALLATION	AND AVAILABLE ACC	CESS SPACE/CLEAF	ANCE												
GRILLE SCHEDULE									CONDENSING BOILER SCHEDULE																			
AG		TY	/PE				BORDER MOL) UIF/N	JOMINAI	FACE SI	ZE NOTE				MBH	MAX ME												
	360° PLAQUE FA		ICTION T-BAR CEILIN			D HI-VCR7	31		24x24		1,2,7	· ·	tag Make	E MODEL	(INPUT)	(OUTPU) ((1IN MBH EV OUTPUT) (°I	F) (°F) GF	AX MIN PM GPM	PD (FT) V	//ph tot. AMF		LBS	NOTES	,)		
			EILING RETURN/EXHA			D-C-SR-ø	F		24x24		3,4,5,6,	78																
			EILING RETURN/EXHA			D-C-SR-ø	F		12x12		3,4,5,6,	7.8	B-1 LOCHINV			1684				34 25		120/1 10		2458	1,2,3,4,5,6			
CG-4			CE MOUNT CEILING [PD-VCR7	31		12x12		1,7		B-2 LOCHINV			1684		67.360 10		34 25		120/1 10	0 13	2458	1,2,3,4,5,6	5		
			EILING RETURN/EXHA			DAL-C-SR-ø	F		12x12		3,4,5,6,7			NDENSATE NEUTRAL						H BACNET BMS								
	RADIAL OPPOSE						ITH INSULATED BACKPA	AN .						FORIZED ISOLATION						H 125 PSI ASM								
	CONCEALED FAS						ITH OPPOSED BLADE D						5 WITH FAC	TORY START-UP A	ND TRAINING				6 WITI	H 1-1/2", 2 F	PSI TO 11″ W	VC GAS PRESSUR	RE REGULATOR (MAXITROL 325	-9L)			
	SQUARE TO ROL						O SCREWHOLES											PUMP SCI	HEDULE									
7 WITH	VHITE POWDER	COAT FINISH ((B12)			8 W	ITH FULL FACED LOUVE	ER OR GRI	D (NO PANEL	MOUNTING)						MAX	MIN				EF							
9 ALUMI	IUM CONSTRUC	TION											TAG	MAKE	MODEL	GPM	GPM	HEAD (FT)	HP	RPM	@10	1. 20% V	//PH	NOTES				
										_			CHWP-1	ТАСО	FI3009D	366	193	70	10	1760	8	31 4	460/3	1,2,3,4				
			EXH	AUST FAN	SCHEDULE	Ē							HWP-1	TACO		204	25	80	7.5	1760	7		460/3	1,2,3,4				
			TOTAL					NOT							NIS VIBRATION IS					2	WITH OD		,					
TAG M	AKE MO	DEL CI	FM ESP (IN WC)	HP	RPM	V/PH	LBS	NOT	ES					I MOUNT UN	NIS VIBRATION IS	ULATION AND BU	JLI TU CUN	ICREIE PAD		2	WIIH UD	MUTUR						
-1 (EX)	_	- 9	60 0.50	1/4	_	115/1	_	_						3 125 PSI PF	RESSURE CLASS					4	WITH VF[D						
EF-2 GRE	ENHECK G-1	130–A 16	535 1.24	3/4	1725	115/1	65	1,2,4,	5,6			Г					F	AN COIL SC							ר			
1 WITH	DIRECT DRIVE	MOTOR				TH VIBRATION ISO	LATION					-	TAG M	AKE	MODEL		CFM		AN FLA	MCA		LBS	N	OTES	-			
3 NOT	USED				4 WI	TH ROOF CURB C	OMPATIBLE WITH METAL G CONTRACTOR AND G	ROOF. CO	OORDINATE					SUBISHI	РКА-А12НА7		425	208/1	0.33	1.0		30		1,2,3,4	-			
5 WITH	HIGH WIND/HU	JRRICANE RATIN	٩G			TH METAL ROOFIN		U.				-		CONDENSATE PUM					MOUNTED						_			
	,													WALL THERMOSTAT					RED BY LOW VOLT	AGE WIRE FRO	MOUTDOOR	UNIT BY MC						
													5 W ith	WALL MILINIOSTAT				+ + OWL		AGE WIRE THO	W COLDOOK							
												Γ						С	ONDENSIN		SCHEDI	ULE]
													TAG	MAKE	MO	DEL	TON	NAGE	LIQUID	SUCTI	ON	V/PH	RLA I	LRA M	CA MOCP	LBS	NOTES	1
													CU-1	MITSUBISHI	PUY-A12	NKA7-BS		1.0	1/4"	1/2"	,	208/1	7	12 1	1 28	92	1,2,3,4	1
													1 SEC	URE TO WALL WITH	H WALL BRACKET,	COORDINATE SU	JPPORT STR	UCTURE WITH GC.		1	2 COO	LING ONLY	1		I	I		1
													3 WITH	H CORROSION PRO	TECTION COATING						4 COO	RDINATE REFRIGE	ERANT LINE SET	LENGTHS & S	SIZES WITH MANUFA	ACTURER'S SPECIFIC	ATION	

	VAV SCHEDULE											EXPANSION TANK SCHEDULE				
			WATER COIL					TAG	MAKE	1	TANK (GAL)	ACCEPTANCE (GAL)	LBS NO ⁻	TES		
TAG MAKE MODEL INLET SIZE MAX CFM PRES	WC) (IN) CFM MBH ROWS		(°F) LAT (°F)	EWT (°F)	LWT (°F)	WPD (FT)	BS NOTES	ET-1	WESSELS	NTA-20	11	8.8		2,3		
	.0 0.18 275 19.95 1		55 95	180	160	4.65 3	0 1,2,3,4,5,7,8		1 TANK SHALL BE	FULLY INSULATED			2 PROVIDED AND INSTALLED BY	Y MC		
VAV-2 TRANE VCWF 5 220 1.	.0 0.070 115 6.41 1	0.50 1/2	55 108.73	180	160	0.50 2	0 1,2,3,4,5,6,8		3 125 PSI RATING							
VAV-3 TRANE VCWF 10 850 1.	.0 0.16 195 11.14 1	0.5 1/2	55 107.68	180	160	0.92 3	0 1,2,3,4,5,6,8									
VAV-4 TRANE VCWF 8 600 1.	.0 0.38 600 26.03 2	1.49 3/4	55 95	180	160	0.19 2	5 1,2,3,4,5,6,8									
VAV-5 TRANE VCWF 5 250 1.	.0 0.08 250 10.85 1	1.18 3/4	55 95	180	160	2.23 2	0 1,2,3,4,5,6,8		1	ļ	AIR SEPARATO	DR SCHEDULE				
VAV-6 TRANE VCWF 4 100 1.	.0 0.03 50 4.44 1	0.50 1/2	55 136.9	180	160	0.49 2	0 1,2,3,4,5,6,8	TAG	MAKE	MODEL C	ONNECTIONS (GPM PD (FT) W	EIGHT (LBS)	NOTES		
VAV-7 TRANE VCWF 5 230 1.	.0 0.07 170 7.69 1	0.50 1/2	55 96.73	180	160	0.5 2	0 1,2,3,4,5,6,8	AS-1	TACO	ACT06-125	6"	366 0.3	185	1,2,3		
VAV-3A (EX) 9 590 -	- 0.50 - 16.44 -		55 80	180	160	_			1 WITH AUTOMATIC	AIR VENT		2 WITH FLUS	H VALVE			
VAV-3B (EX) 7 360 -	- 0.50 - 10.03 -	,	55 80	180	160	_			3 125 PSI RATING							
VAV-3C (EX) - - 10 700 - VAV-3D (EX) - - 6 290 -	- 0.50 - 19.5 -	, , , , , , , , , , , , , , , , , , , ,	55 80 55 80	180	160											
VAV-3D (EX) - - 6 290 - VAV-3E (EX) - - 12 1000 -	- 0.50 - 8.08 - - 0.50 - 29.4 -		55 80 55 81.4	180	160 160	_										
1 WITH 1" INSULATION LINER		2 WITH HOT WATER REHEAT COIL		100	100											
3 CONTROL PACKAGE AND ACTUATOR SHALL BE PROVIDED BY CONTROLS CONTRACT		4 PROVIDE HIGH CAPACITY COILS AND/OR OVER	RSIZED CASINGS AS REQUIRED	D TO MEET PERFORM	MANCE			TAG	MAKE	MODEL	TANK (GAL)	LBS NOTES				
5 WITH FACTORY PROVIDED AND INSTALLED PIPING PACKAGE (INCLUDING VALVE) TO) MATCH HOT WATER COIL DETAILS	6 WITH 2-WAY CHARACTERIZED CONTROL VALVE	PROVIDED BY CONTROLS CO	ONTRACTOR AND FAC	CTORY INSTALLED			CF-1	WESSELS	CPFT-5	5	35 1				
7 WITH 3-WAY CONTROL VALVE PROVIDED BY CONTROLS CONTRACTOR AND FACTOR		B COORDINATE RIGHT OR LEFT HAND PIPING/CC				NCF			1 125PSI RATING							
		,,,,,,,,,,,,,,,,,,,,,,,,,			,,											
GRIL	LE SCHEDULE						CONDENSI	NG BOILER S	SCHEDULE		1					
TAG TYPE MAKE	MODEL BORDER MODULE/NOMINA	L FACE SIZE NOTES			MBH	MAX MBH	MIN MBH E	WT LWT MA	X MIN PD	V/PH TOTAL		NOTEC				
CG-1 360° PLAQUE FACE HIGH INDUCTION T-BAR CEILING DIFFUSER PRICE	SPD HI-VCR7 31 24x24	1,2,7	— TAG MAKE		(INPUT)	(OUTPUT)	(OUTPUT) ((°F) (°F) GP	M GPM (FT) ^{V/PH} AMPS	MCA LBS	NOTES				
CG-2 LOUVERED SURFACE MOUNT CEILING RETURN/EXHAUST GRILLE PRICE	530D-C-SR-ø F 24x24	3,4,5,6,7,8	B-1 LOCHINVA	AR FBN-1751	1750	1684	67.360	100 140 84	25 8.1	120/1 10	13 2458	1,2,3,4,5,6				
CG-3 LOUVERED SURFACE MOUNT CEILING RETURN/EXHAUST GRILLE PRICE	530D-C-SR-ø F 12x12	2 3,4,5,6,7,8	B-2 LOCHINVA	AR FBN-1751	1750	1684	67.360	100 140 84	25 8.1	120/1 10	13 2458	1,2,3,4,5,6				
CG-4 360° PLAQUE FACE SURFACE MOUNT CEILING DIFFUSER PRICE	SPD-VCR7 31 12x12	2 1,7	1 WITH CON	IDENSATE NEUTRALI	ZATION KIT			2 WITH	BACNET BMS GATE	 VAY						
CG-5 LOUVERED SURFACE MOUNT CEILING RETURN/EXHAUST GRILLE PRICE	630DAL-C-SR-ø F 12x12	3,4,5,6,7,8,9	3 WITH MOT	ORIZED ISOLATION	VALVE			4 WITH	125 PSI ASME REL	IEF VALVE						
1 WITH RADIAL OPPOSED BLADE DAMPER	2 WITH INSULATED BACKPAN		5 WITH FACT	TORY START-UP AN	ND TRAINING			6 WITH	1-1/2", 2 PSI TO	11" WC GAS PRESSURE REG	GULATOR (MAXITROL 325	-9L)				
3 WITH CONCEALED FASTENING	4 WITH OPPOSED BLADE DAMPER															
5 WITH SQUARE TO ROUND ADAPTER	6 NO SCREWHOLES						PUMP SC									
7 WITH WHITE POWDER COAT FINISH (B12)	8 WITH FULL FACED LOUVER OR GRID (NO PA	NEL MOUNTING)	TAG	MAKE	MODEL		IN HEAD (FT) HP	RPM	EFF. V/PH @100%	I NOTES					
9 ALUMINUM CONSTRUCTION			┛													
EXHAUST FAN SCHE	DULE		CHWP-1	TACO	FI3009D		93 70	10	1760	81 460/3						
TOTAL		—	HWP-1	TACO	FI2009D	204 2	5 80	7.5	1760	76 460/3	1,2,3,4					
TAG MAKE MODEL CFM ESP HP RPM	I V/PH LBS NOTES			1 MOUNT ON I	NIS VIBRATION ISC	LATION AND BOLT TO	CONCRETE PAD		2 WI	ITH ODP MOTOR						
EF-1 (EX) 960 0.50 1/4 -	115/1 – –			3 125 PSI PRI	ESSURE CLASS				4 WI	ITH VFD						
EF-1 (EX) - - 960 0.50 1/4 - EF-2 GREENHECK G-130-A 1635 1.24 3/4 1725												ר				
1 WITH DIRECT DRIVE MOTOR	2 WITH VIBRATION ISOLATION		TAG M/	AKE	MODEL	CFM		FAN FLA	МСА	LBS	NOTES	-				
3 NOT USED	, WITH ROOF CURB COMPATIBLE WITH METAL ROOF. COORDINATE					425	208/1	0.33	1.0	30	1,2,3,4	-				
5 WITH HIGH WIND/HURRICANE RATING	⁴ WITH METAL ROOFING CONTRACTOR AND GC.6 WITH STAINLESS STEEL FASTENERS			CONDENSATE PUMP		423		L MOUNTED	1.0	50	1,2,0,7	-				
				WALL THERMOSTAT				/ERED BY LOW VOLTA		DOOR UNIT BY MC						
										DOOK ONT DI MC						
			CONDENSING UNIT SCHEDULE													
			TAG	MAKE	MOD	EL	TONNAGE	LIQUID	SUCTION	V/PH RI	A LRA MO	CA MOCP LBS	NOTES			
			CU-1	MITSUBISHI	PUY-A12N	KA7–BS	1.0	1/4"	1/2"	208/1	' 12 1	1 28 92	1,2,3,4			
			1 SECU	URE TO WALL WITH	WALL BRACKET,	COORDINATE SUPPORT	STRUCTURE WITH GC.			2 COOLING ONLY	I	I I				
		3 WITH	ECTION COATING			4 COORDINATE REFRIGERANT LINE SET LENGTHS & SIZES WITH MANUFACTURER'S SPECIFICATION										

VAV SCHEDULE																		EXPANSION TANK SCHEDULE								
					INLET	τοται ρη	MIN/HEATI				HOT \	VATER COIL						TAG	MAKE	MOD		TANK (GAL)		ANCE (GAL)	LBS	NOTES
TAG	MAKE	MODEL	INLET SIZE	E MAX CFM	PRESSURE (IN WC)	(IN)	CFM		ROWS G	PM BRANCH			EWT (°F)	LWT (°F)	WPD (FT)	- LBS	NOTES	ET-1	WESSELS	NTA-		11	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	8.8	55	1,2,3
VAV-1	TRANE	VCWF	10	925	1.0	0.18	275	19.95	1 1	.27 3/4	55	95	180	160	4.65	30	1,2,3,4,5,7,8		1 TANK SHALL BE	FULLY INSULAT	ΓED				PROVIDED AND IN	STALLED BY MC
VAV-2	TRANE	VCWF	5	220	1.0	0.070	115	6.41	1 0	.50 1/2	55	108.73	180	160	0.50	20	1,2,3,4,5,6,8		3 125 PSI RATING							
VAV-3	TRANE	VCWF	10	850	1.0	0.16	195	11.14	1 ().5 1/2	55	107.68	180	160	0.92	30	1,2,3,4,5,6,8									
VAV-4	TRANE	VCWF	8	600	1.0	0.38	600	26.03	2 1	.49 3/4	55	95	180	160	0.19	25	1,2,3,4,5,6,8									
VAV-5	TRANE	VCWF	5	250	1.0	0.08	250	10.85	1 1	.18 3/4	55	95	180	160	2.23	20	1,2,3,4,5,6,8			1		IR SEPARAT				
VAV-6	TRANE	VCWF	4	100	1.0	0.03	50	4.44	1 0	.50 1/2	55	136.9	180	160	0.49	20	1,2,3,4,5,6,8	TAG	MAKE	MOD	DEL CO	ONNECTIONS	GPM PD	(FT) WE	EIGHT (LBS)	NOTE
VAV-7	TRANE	VCWF	5	230	1.0	0.07	170	7.69		.50 1/2	55	96.73	180	160	0.5	20	1,2,3,4,5,6,8	AS-1	TACO	ACT06-	-125	6"	366 0	.3	185	1,2,3
VAV-3A (EX)	-	_	9	590	-	0.50	-	16.44		.6 3/4			180	160	-	-	-		1 WITH AUTOMATIC	AIR VENT				2 WITH FLUSH	VALVE	
VAV-3B (EX)	-	_	7	360	-	0.50	-	10.03		.0 1/2	55	80	180	160	-	-	-		3 125 PSI RATING							
VAV-3C (EX)	-		10	290	-	0.50	-	8.08		2.0 3/4 0.8 1/2	55	80	180	160	-	-	-									
VAV-3D (EX)			12	1000	_	0.50		29.4		2.9 1/2	55	81.4	180	160	_	-	_									
	WITH 1" I	NSULATION LINE				0.00		20.1		HOT WATER REHEAT CO				100										NOTEO		
				ROVIDED BY CONTROLS	CONTRACTOR AND F	ACTORY INSTALL	FD					ED CASINGS AS REQUIRE	ED TO MEET PERFO	RMANCE				TAG	MAKE	MOD		TANK (GAL)	LBS	NOTES		
				PACKAGE (INCLUDING							·	OVIDED BY CONTROLS C						CF-1	WESSELS	CPFT	-5	5	35	1		
				NTROLS CONTRACTOR A								ROLS WITH INSTALLATION							1 125PSI RATING							
	GRILLE SCHEDULE								CONDENSING BOILER SCHEDULE																	
TAG			TYPE		MAKE M	ODEL	BORDER	MODULE/	NOMINAL FA	ACE SIZE	NOTES			MBH	MAX ME	3H MI	IN MBH E	WT LWT M	AX MIN PC		TOTAL					
CG-1	60° PLAQU	E FACE HIGH I	IDUCTION T-BAR CEI	ILING DIFFUSER	PRICE SPD	HI-VCR7	31		24x24		1,2,7	TAG MAKE	E MODEL	(INPUT)	(OUTPU ⁻				PM GPM (FT		AMPS	MCA LBS	NOTE	S		
CG-2 I	OUVERED S	SURFACE MOUN	CEILING RETURN/EX	XHAUST GRILLE	PRICE 530E)–C–SR–ø	F		24x24		3,4,5,6,7,8	B-1 LOCHINV	/AR FBN-1751	1750	1684		67.360 1	100 140 8	34 25 8.1	120/1	10	13 2458	1,2,3,4,5	5,6		
CG-3 I	OUVERED S	SURFACE MOUN	CEILING RETURN/EX	XHAUST GRILLE	PRICE 530E)–C–SR–ø	F		12x12		3,4,5,6,7,8	B-2 LOCHINV	/AR FBN-1751	1750	1684				34 25 8.1	120/1	10	13 2458	1,2,3,4,5	5,6		
CG-4	360° PLA	AQUE FACE SU	FACE MOUNT CEILING	G DIFFUSER	PRICE SF	PD-VCR7	31		12x12		1,7	1 WITH CON	NDENSATE NEUTRA	LIZATION KIT					H BACNET BMS GATE	WAY						
CG-5 I	OUVERED S	SURFACE MOUN	CEILING RETURN/EX	XHAUST GRILLE	PRICE 630DA	AL-C-SR-ø	F		12x12		3,4,5,6,7,8,9	3 WITH MOT	TORIZED ISOLATION	N VALVE				4 WIT	H 125 PSI ASME REL	IEF VALVE						
1 WITH F	ADIAL OPP	OSED BLADE D	MPER			2 V	WITH INSULATED BA	CKPAN				5 WITH FAC	CTORY START-UP	AND TRAINING				6 WIT	H 1-1/2", 2 PSI TO	11" WC GAS	PRESSURE REG	ULATOR (MAXITROL 32	5–9L)			
3 WITH (ONCEALED	FASTENING				4 V	WITH OPPOSED BLA	DE DAMPER																		
5 WITH S	QUARE TO	ROUND ADAPT	R			6 N	NO SCREWHOLES										PUMP SC	HEDULE	1 1							
7 WITH V	HITE POWE	DER COAT FINIS	H (B12)			8 V	WITH FULL FACED I	_OUVER OR GR	ND (NO PANEL MO	UNTING)		TAG	MAKE	E MODEL	MAX	MIN	HEAD (FT)) HP	RPM	EFF.	V/PH	NOTES	2			
9 ALUMII	IUM CONST	RUCTION										IAO			GPM	GPM				@100%	v/111					
												CHWP-1	TACO	FI3009D	366	193	70	10	1760	81	460/3	1,2,3,4				
				HAUST FAN								HWP-1	TACO	FI2009D	204	25	80	7.5	1760	76	460/3	1,2,3,4				
TAG M	4KE	MODEL	CFM ESP	- HP	RPM	V/PH	LBS	NO	TES				1 MOUNT ON	I NIS VIBRATION IS	OLATION AND BO	LT TO CONC	CRETE PAD		2 W	ITH ODP MOTO	R					
			(IN WO	C)									3 125 PSI P	RESSURE CLASS					4 W	ITH VFD						
EF-1 (EX)	-	-	960 0.50	1/4	-	115/1	-	-	-																	
EF-2 GRE	ENHECK	G-130-A	1635 1.24	3/4	1725	115/1	65	1,2,4	-,5,6							FA	AN COIL SC	CHEDULE								
1 WITH	DIRECT DR	RIVE MOTOR				h vibration isc						TAG M	IAKE	MODEL	С	FM	V	FAN FLA	MCA	LE	3S	NOTES				
3 NOT	USED				4 WITH 4 WITH	H ROOF CURB (H METAL ROOFIN	COMPATIBLE WITH N NG CONTRACTOR AN	METAL ROOF. (ND GC.	COORDINATE			FC-1 MIT	ISUBISHI	PKA-A12HA7	4	-25	208/1	0.33	1.0	3	0	1,2,3,4				
5 WITH	HIGH WIND)/HURRICANE F	ATING		6 WITH	H STAINLESS ST	EEL FASTENERS					1 WITH CONDENSATE PUMP 2 WALL MOUNTED														
												3 WITH	WALL THERMOSTA	Г			4 POW	ERED BY LOW VOLT	AGE WIRE FROM OUT	DOOR UNIT BY	MC					
																					1					
												CONDENSING UNIT SCHEDULE TAG MAKE MODEL TONNAGE LIQUID SUCTION V/PH RLA MCA MOCP LBS NOTES							-							
													MITSUBISHI					1/4"	1/2"	208/		A LƘA M 12	11 28	92	1,2,3,4	-
												CU-1 MITSUBISHI PUY-A12NKA7-BS 1.0 1 SECURE TO WALL WITH WALL BRACKET, COORDINATE SUPPORT STRUCTURE WITH GC.											·,~,~, , , , , ,	-		
														DTECTION COATING								LINE SET LENGTHS &	SIZES WITH MANU			
													I CONTOSION PRO	STECTION COATING							. NEFRIGERANI	LINE JEI LENGIHS &	JIZEJ WITH MANU	AUTUNER 3 SPECIFIC		

2 WITH FACTORY MOUNTED ACROSS THE LINE STARTER

4 UNIT CASING SHALL BE FABRICATED OF PRE-PAINTED OR GALVANIZED STEEL. ALL MEMBERS SHALL MEET 1000-HOUR SALT S 6 WITH NIS ISOLATOR KIT

8 WITH FACTORY START-UP

10 CONDENSER COILS SHALL HAVE ELECTROFIN BAKED EPOXY COATING PROVIDING 5000+ HOURS OF SALTSPRAY RESISTANCE FAC APPLIED TO BOTH THE COIL AND COIL FRAMES.

12 WITH BACNET COMMUNICATION CARD

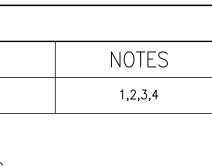
4 WITH HINGED ACCESS PANEL FOR FAN, FILTERS, UPSTREAM OF COIL, AND DOWNSTREAM OF COIL

6 WITH STAINLESS STEEL DRAIN PAN

8 WITH RETURN/OUTDOOR AIR MIXING BOX WITH DAMPERS (TOP AND REAR) 10 INSTALL BIPOLAR ION GENERATOR AND POWER THROUGH/INTERLOCK WITH SUPPLY FAN. PROVIDE TRANSFORMER AS NECESSARY. COORDINATE WITH CONTROLS CONTRACTOR.

12 MOUNT ON SPRING VIBRATION ISOLATION. FAN SHALL BE NIS ISOLATED.

			BIPOLAR ION GENERATOR SCHEDULE										
	TAG	MAKE	MODEL	SERVING	LENGTH	CFM	ELECTRODE PAIRS	V	VA	mA	NOTES		
DTES	IG-1	PLASMA AIR	PB-030	AHU-1	30"	5100	5	24	3.60	150	1,2,3,4,5		
7,8,9,10,11,12	IG-2	PLASMA AIR	PB-030	AHU-2	30"	5100	5	24	3.60	150	1,2,3,4,5		
	IG-3	PLASMA AIR	PB-036	AHU-3	36"	6730	6	24	4.30	180	1,2,3,4,5		
	IG-4	PLASMA AIR	PB-024	AHU-4	24"	4000	4	24	2.90	120	1,2,3,4,5		
SPRAY TEST.	IG-5	PLASMA AIR	PB-024	AHU-5	24"	4000	4	24	2.90	120	1,2,3,4,5		
	IG-6	PLASMA AIR	PB-030	AHU-6	30"	5600	5	24	3.60	150	1,2,3,4,5		
	IG-7	PLASMA AIR	PB-018	AHU-7	18"	2940	3	24	2.20	90	1,2,3,4,5		
ACTORY	1	WITH INTEGRAL \	ARIABLE OUTPU	T WITH AIRFLOW	•	· · · ·		2 WITH UL 867 LISTING					
	3	POWER THROUGH	I AIR HANDLER	FAN CONTROL PO	WER BY MC			4	WITH AUTO	MATIC FAULT	RESET		
	5	WITH RECESSED	ION GENERATIN	G NEEDLES									





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	HVAC CONTROLS AND INSTRUMENTATION NOTES	┨
	NTROLS SCOPE OF WORK	GENERAL
1.	THE HVAC CONTROLS PORTION OF THIS PROJECT SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR OR HIS CONTROLS SUBCONTRACTOR. JOHNSON CONTROLS SHALL BE UTILIZED. THIS INCLUDES BUT IS NOT LIMITED TO ALL PROGRAMMING, SOFTWARE, GRAPHICS, HARDWARE, SENSORS, CONTROLLERS, DRIVES, STARTERS, LOW VOLTAGE (LESS THAN 120V) CONTROL WIRING, AND TERMINATIONS.	ALL CONTROL WHETHER OR USED TO IMF ALL NECESSA SHALL PROVI
2.	THE CONTROLS CONTRACTOR SHALL PROVIDE AND INSTALL ALL LOW VOLTAGE EQUIPMENT, COMPONENTS, AND WIRING.	CHWP-1
3.	120V POWER SHALL BE BROUGHT TO CONTROL COMPONENTS AS NECESSARY BY THE ELECTRICAL CONTRACTOR. COORDINATE ALL WORK WITH THE ELECTRICAL AND FIRE ALARM CONTRACTORS.	THE PUMP S
4.	THE CONTROLS CONTRACTOR SHALL PROVIDE ALL MATERIAL AND LABOR NECESSARY TO FACILITATE THE SPECIFIED SEQUENCE OF OPERATION.	THERMOSTAT, PRESSURE SI PIPING. THE PRE-SET DIF
5.	VARIABLE FREQUENCY DRIVES (VFDs) SHALL BE PROVIDED BY THE CONTROLS CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. VARIABLE FREQUENCY DRIVES SHALL BE PROVIDED FOR EQUIPMENT MOTORS AS SPECIFIED. ALL VFDs INDICATED SHALL BE PROVIDED BY THE CONTROLS CONTRACTOR AND SHALL NOT COME WITH EQUIPMENT. ALL VFDs SHALL HAVE BYPASS.	IF THE PUMP INTERFACE. OFF. A PRES CONDITION (1 SIGNALED AT
6.	MOTOR STARTERS SHALL BE PROVIDED BY THE CONTROLS CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED. MOTOR STARTERS SHALL BE PROVIDED FOR ALL MOTORS REQUIRING A START/STOP SIGNAL FROM THE HVAC CONTROL SYSTEM.	SHALL BE MA THE VFD SHA CH-1
7.	LOW VOLTAGE CONTROL WIRING CONDUIT/RACEWAYS SHALL BE PROVIDED AND INSTALLED BY THE CONTROLS CONTRACTOR. ALL LOW VOLTAGE CONTROL WIRING IN EXPOSED AREAS (MECHANICAL ROOMS, ETC.) SHALL BE INSTALLED IN CONDUIT. ALL LOW VOLTAGE CONTROL WIRING IN CONCEALED AREAS (ABOVE CEILINGS, ETC.) SHALL BE PROPERLY SUPPORTED FROM STRUCTURE WITH J-HOOKS.	THE CHILLER SHALL MONIT UPON A CALL
8.	AIR DAMPER ACTUATORS SHALL BE PROVIDED AND INSTALLED BY THE CONTROLS CONTRACTOR. AIR DAMPERS SHALL BE PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR.	SENSOR IN T SWITCH, THE TEMPERATURE
9.	ALL CONTROL VALVES AND VALVE ACTUATORS SHALL BE PROVIDED BY THE CONTROLS CONTRACTOR AND INSTALLED BY THE MECHANICAL CONTRACTOR. CONTROL WIRING TO ALL VALVES SHALL BE BY THE CONTROLS CONTRACTOR. VALVES SHALL HAVE INTEGRAL TEMPERATURE/PRESSURE PORTS WHEN AVAILABLE.	AT THE BAS CHILLER SHA FOR THE CHI
10.	ALL PIPE PRESSURE, TEMPERATURE, FLOW, ETC. SENSOR PORTS SHALL BE PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR. ALL PIPE PRESSURE, TEMPERATURE, FLOW, ETC. SENSORS SHALL BE PROVIDED AND INSTALLED BY THE CONTROLS CONTRACTOR.	HWP-1 THE PUMP S TEMPERATURE
11.	ALL DUCT PRESSURE, TEMPERATURE, HUMIDITY, ETC. SENSORS AND PORTS SHALL BE PROVIDED AND INSTALLED BY THE CONTROLS CONTRACTOR.	BOTH THE HO MINIMUM FLO HOT WATER S
12.	ALL NECESSARY 120V TO LOW VOLTAGE TRANSFORMERS SHALL BE PROVIDED AND INSTALLED BY THE CONTROLS CONTRACTOR.	ALARM COND RE-HEAT IN
13.	ION GENERATORS SHALL BE PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR. THEY SHALL BE WIRED BY THE CONTROLS CONTRACTOR.	DOWNSTREAM A HIGH HOT AND MAXIMUN STANDARDS A
14.	CONDENSATE OVERFLOW SWITCHES SHALL BE PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR. THEY SHALL BE WIRED BY THE CONTROLS CONTRACTOR.	<u>B-1 & B-2</u>
15.	DUCT SMOKE DETECTORS SHALL BE PROVIDED AND INSTALLED BY THE CONTROLS CONTRACTOR. ALL UNITS OVER 2000 CFM SHALL HAVE RETURN DUCT MOUNTED SMOKE DETECTORS. CONTROLS CONTRACTOR SHALL VERIFY ALL RETURN DUCT SMOKE DETECTORS ARE COMPATIBLE WITH THE FIRE ALARM SYSTEM. SMOKE DETECTORS SHALL BE ADDRESSABLE AND ABLE TO BE MONITORED BY THE FIRE ALARM SYSTEM. WIRING FOR SIGNAL TO THE FIRE ALARM PANEL SHALL BE PROVIDED AND INSTALLED BY THE FIRE ALARM CONTRACTOR. COORDINATE WITH FIRE ALARM CONTRACTOR.	EACH BOILER SHALL MONIT NORMALLY OF WATER PIPING VALVE SHALL
16.	THE CHILLERS AND BOILERS HAVE FACTORY PROVIDED CONTROLLERS. THE CONTROLS CONTRACTOR SHALL PROVIDE AND INSTALL INTEGRATION OF THESE CONTROLLERS INTO THE BAS. COORDINATE WITH THE MANUFACTURERS.	BE SIGNALED VALVE SHALL THE BOILER. THE BOILERS
17.	ALL WORK SHALL BE CAREFULLY COORDINATED BETWEEN THE CONTROLS CONTRACTOR, MECHANICAL CONTRACTOR, ELECTRICAL CONTRACTOR, FIRE ALARM CONTRACTOR, TEST AND BALANCE CONTRACTOR, AND ALL WORK DEPICTED ON THE DRAWINGS AND SPECIFICATIONS.	SYSTEM AND TO MAINTAIN OPERATING B SUNDAY AFTE
18.	A PRE-INSTALLATION MEETING SHALL BE HELD AT LEAST ONE WEEK PRIOR TO STARTING THE CONTROLS PORTION OF WORK. ATTENDANCE SHALL BE MANDATORY FOR THE CONTROLS CONTRACTOR, MECHANICAL CONTRACTOR, ELECTRICAL CONTRACTOR, FIRE ALARM CONTRACTOR, AND TEST AND BALANCE CONTRACTOR.	NON-OPERAT ALARM COND CALL FOR HE BY ONE BOIL
19.	A PRE-INSTALLATION MEETING SHALL BE HELD AT LEAST ONE WEEK PRIOR TO STARTING THE TEST AND BALANCE PORTION OF WORK. ATTENDANCE SHALL BE MANDATORY FOR THE CONTROLS CONTRACTOR, MECHANICAL CONTRACTOR, AND TEST AND BALANCE CONTRACTOR.	BOTH BOILER OPERATION, 1 PUMP/VALVE
20.	THE CONTROLS CONTRACTOR SHALL BE COPIED ON ALL EQUIPMENT SUBMITTALS RELATIVE TO THEIR WORK (VALVE ACTUATORS, CONTROL DAMPERS, PIPE PORTS, FANS, PUMPS, CHILLERS, BOILERS, ETC.) FOR REVIEW AND COMMENT. COORDINATE WITH MECHANICAL CONTRACTOR.	UPON A CALI SECOND, AND SHUTDOWN.
21.	THE BAS SHALL BE CONTROLLABLE FROM THE CUSTOMERS EXISTING JOHNSON CONTROL SYSTEM. ALL POINTS SHALL BE INTEGRATED INTO THE EXISTING SYSTEM AND NEW USER—FRIENDLY GRAPHIC DISPLAY INTERFACE SHALL BE PROGRAMMED FOR ALL SYSTEMS.	<u>AUTOMATIC D</u> CHILLED
22.	THE CONTROLS CONTRACTOR SHALL PROVIDE SITE-SPECIFIC, ON-SITE TRAINING FOR BAS OPERATION. THIS INCLUDES, BUT IS NOT LIMITED TO SYSTEM ARCHITECTURE, CONTROLLER OPERATION, CONTROL DRAWINGS, DEVICE REPLACEMENT, PRODUCT OVERVIEW, DEMONSTRATIONS, LOG ON/LOG OFF, SYSTEM PASSWORDS, SCREEN LAYOUT, SOFTWARE TOOLBARS/MENUS, GRAPHIC PAGE NAVIGATION/USE, SCHEDULING (REGULAR, TEMPORARY, AND SPECIAL), BASIC TROUBLESHOOTING, ETC. CONTROLS CONTRACTOR SHALL INCLUDE A MINIMUM OF 40 HOURS OF ON SITE DEDICATED INSTRUCTOR TIME FOR SYSTEM PLANT, EQUIPMENT, AND CONTROLS OPERATION.	A NORMA BETWEEN WATER DI MODULATE SUPPLY A VALVE SH AT IT'S D
23.	OWNER REQUIRES THE FOLLOWING TO PROVIDE UNIFORMITY IN END USER CONTROL SYSTEM OPERATION, GRAPHICS, PROGRAMMING, PERSONNEL TRAINING, ETC. THROUGHOUT ITS FACILITIES: CONTROL SYSTEM SHALL BE JOHNSON CONTROLS. NO SUBSTITUTIONS.	hot wate A norma
24.	ALL MANUFACTURERS RECOMMENDED CONTROL POINT LOADING AND SHALL BE FOLLOWED FOR ALL CONTROLLERS AND DEVICES.	BETWEEN DIFFEREN OPEN TO THE HOT
25.	ALL CONTROLLER AND CONTROLLER PANELS SHALL HAVE 25% MINIMUM SPARE PHYSICAL CAPACITY ONCE FULLY LOADED AND INTEGRATED INTO THE SYSTEM (i.e. 25% SPARE CONTROLLER POINT CONNECTIONS FOR FUTURE EXPANSION, 25% SPARE PANEL SPACE AVAILABLE FOR FUTURE CONTROLLERS, ETC.).	CLOSED. DESIGNAT DETERMINATIO
26.	WHEN THE SEQUENCE OF OPERATION, DRAWINGS, DIAGRAMS, POINTS LISTS, AND/OR SPECIFICATIONS DIFFER FROM ONE ANOTHER, THE MORE STRINGENT REQUIREMENT SHALL BE PROVIDED. IF A COMPONENT, POINT, PROGRAM, ETC. IS LISTED IN ONE DOCUMENT BUT NOT ANOTHER. OR IF IT IS NECESSARY FOR THE OPERATION. IT SHALL BE PROVIDED.	OCCUPIED AN PROGRAMMAB

UTHER, OR IF IT IS NECESSART FOR THE OPERATION, IT SHALL B 27. COMPLETE SHOP DRAWINGS, CONTROL DIAGRAMS, PRODUCT SUBMITTALS, AND SEQUENCE OF OPERATION SHALL BE PREPARED BY THE CONTROLS CONTRACTOR AND SHALL BE SUBMITTED TO THIS ENGINEER FOR REVIEW AND COMMENT PRIOR TO MATERIAL ORDER AND INSTALLATION.

HOT WATER SYSTEM:

CHILLED WATER COIL OPERATION: MODULATE OPEN.

CONTROL SEQUENCE OF OPERATION

ALL CONTROL POINTS LISTED ON THE CONTROL DIAGRAMS SHALL BE INSTALLED AND INTEGRATED INTO THE BAS WHETHER OR NOT THEY ARE SPECIFICALLY DETAILED IN THE SEQUENCE OF OPERATION. CONTROL POINTS NOT USED TO IMPLEMENT THE SEQUENCE SHALL BE USED FOR MONITORING PURPOSES. DRAWINGS MAY NOT SHOW ALL NECESSARY CONTROL POINTS TO IMPLEMENT THE SEQUENCE OF OPERATION. THE CONTROLS CONTRACTOR SHALL PROVIDE ALL NECESSARY POINTS WHETHER OR NOT SHOWN ON THE CONTRACT DOCUMENTS.

THE PUMP SHALL BE EQUIPPED WITH A VFD. UPON A CALL FOR COOLING OR DEHUMIDIFICATION AT ANY THERMOSTAT, TEMPERATURE SENSOR, OR HUMIDITY SENSOR IN THE SYSTEM, THE PUMP SHALL START. A PRESSURE SENSOR SHALL BE INSTALLED IN BOTH THE CHILLED WATER SUPPLY AND THE CHILLED WATER RETURN PIPING. THE PUMP SHALL VARY SPEED FROM MINIMUM FLOW TO MAXIMUM FLOW TO MAINTAIN A CONSTANT, PRE-SET DIFFERENTIAL PRESSURE BETWEEN THE CHILLED WATER SUPPLY AND CHILLED WATER RETURN PIPING. IF THE PUMP FAILS TO START UPON SIGNAL, A PUMP ALARM CONDITION SHALL BE SIGNALED AT THE BAS INTERFACE. WHEN THERE IS NO CALL FOR COOLING OR DEHUMIDIFICATION IN THE SYSTEM, THE PUMP SHALL BE OFF. A PRESSURE SENSOR SHALL BE INSTALLED DIRECTLY DOWNSTREAM OF THE PUMP. UPON A HIGH PRESSURE CONDITION (150 PSIG), THE PUMP SHALL TURN OFF AND A HIGH CHILLED WATER PRESSURE ALARM SHALL BE SIGNALED AT THE BAS INTERFACE. MINIMUM MOTOR RUN TIME AND MAXIMUM NUMBER OF STARTS PER HOUR SHALL BE MAINTAINED FOR THE PUMP BASED UPON NEMA STANDARDS AND MANUFACTURER'S RECOMMENDATIONS. THE VFD SHALL LIMIT PUMP FLOW RATE CHANGE TO 10% PER MINUTE BETWEEN MINIMUM AND MAXIMUM FLOW.

THE CHILLER SHALL HAVE IT'S OWN OPERATIONAL CONTROLLER THAT COMMUNICATES WITH THE BAS. THE BAS SHALL MONITOR/CONTROL ALL AVAILABLE POINTS FROM THE FACTORY CONTROLLER.

UPON A CALL FOR COOLING OR DEHUMIDIFICATION AT ANY THERMOSTAT, TEMPERATURE SENSOR, OR HUMIDITY SENSOR IN THE SYSTEM, THE CHILLER'S CONTROL VALVE SHALL OPEN. WHEN FLOW IS PROVEN AT IT'S FLOW SWITCH, THE CHILLER SHALL START. THE CHILLER SHALL OPERATE TO MAINTAIN 42" F LEAVING WATER TEMPERATURE. IF THE CHILLER FAILS TO START UPON SIGNAL A CHILLER ALARM CONDITION SHALL BE SIGNALED AT THE BAS INTERFACE. WHEN THERE IS NO CALL FOR COOLING OR DEHUMIDIFICATION IN THE SYSTEM, THE CHILLER SHALL BE OFF. MINIMUM RUN TIME AND MAXIMUM NUMBER OF STARTS PER HOUR SHALL BE MAINTAINED FOR THE CHILLER BASED UPON NEMA STANDARDS AND MANUFACTURER'S RECOMMENDATIONS.

THE PUMP SHALL BE EQUIPPED WITH A VFD. UPON A CALL FOR HEATING OR RE-HEAT AT ANY THERMOSTAT OR TEMPERATURE SENSOR IN THE SYSTEM, THE PUMP SHALL START. A PRESSURE SENSOR SHALL BE INSTALLED IN BOTH THE HOT WATER SUPPLY AND THE HOT WATER RETURN PIPING. THE PUMP SHALL VARY SPEED FROM MINIMUM FLOW TO MAXIMUM FLOW TO MAINTAIN A CONSTANT, PRE-SET DIFFERENTIAL PRESSURE BETWEEN THE HOT WATER SUPPLY AND HOT WATER RETURN PIPING. IF THE PUMP FAILS TO START UPON SIGNAL, A PUMP ALARM CONDITION SHALL BE SIGNALED AT THE BAS INTERFACE. WHEN THERE IS NO CALL FOR HEATING OR RE-HEAT IN THE SYSTEM, THE PUMP SHALL BE OFF. A PRESSURE SENSOR SHALL BE INSTALLED DIRECTLY DOWNSTREAM OF THE PUMP. UPON A HIGH PRESSURE CONDITION (150 PSIG), THE PUMP SHALL TURN OFF AND A HIGH HOT WATER PRESSURE ALARM SHALL BE SIGNALED AT THE BAS INTERFACE. MINIMUM MOTOR RUN TIME AND MAXIMUM NUMBER OF STARTS PER HOUR SHALL BE MAINTAINED FOR THE PUMP BASED UPON NEMA STANDARDS AND MANUFACTURER'S RECOMMENDATIONS.

EACH BOILER SHALL HAVE IT'S OWN OPERATIONAL CONTROLLER THAT COMMUNICATES WITH THE BAS. THE BAS SHALL MONITOR/CONTROL ALL AVAILABLE POINTS FROM THE FACTORY CONTROLLER. A FACTORY PROVIDED, NORMALLY OPEN/POWERED CLOSE, 2-POSITION, MOTORIZED CONTROL VALVE SHALL BE INSTALLED IN THE HOT WATER PIPING DIRECTLY DOWNSTREAM OF EACH BOILER. WHEN A BOILER IS OFF, IT'S RESPECTIVE CONTROL VALVE SHALL BE CLOSED. IF A VALVE IS NOT AT IT'S DESIGNATED POSITION, A VALVE ALARM CONDITION SHALL BE SIGNALED AT THE BAS INTERFACE. WHEN A BOILER IS SIGNALED TO OPERATE, IT'S RESPECTIVE CONTROL VALVE SHALL OPEN TO PROVE FLOW. AN INTERNAL, FACTORY MOUNTED FLOW SWITCH SHALL BE INSTALLED AT THE BOILER. A FACTORY SUPPLIED LEAVING WATER TEMPERATURE SENSOR SHALL BE INSTALLED DOWNSTREAM OF THE BOILERS. UPON A CALL FOR HEATING OR RE-HEAT AT ANY THERMOSTAT OR TEMPERATURE SENSOR IN THE SYSTEM AND FLOW IS PROVEN AT IT'S FLOW SWITCH, ONE BOILER SHALL START. THE BOILER SHALL OPERATE TO MAINTAIN 140'F LEAVING WATER TEMPERATURE. THE SECOND BOILER SHALL REMAIN OFF. THE DESIGNATED OPERATING BOILER SHALL AUTOMATICALLY SWITCH BETWEEN B-1 AND B-2 ONCE PER WEEK AT 2:00 PM ON SUNDAY AFTERNOONS. IF THE DESIGNATED OPERATING BOILER FAILS TO START UPON SIGNAL, THE NON-OPERATIONAL BOILER SHALL BE AUTOMATICALLY SWITCHED TO BE THE OPERATIONAL BOILER AND A BOILER ALARM CONDITION FOR THE FAILED BOILER SHALL BE SIGNALED AT THE BAS INTERFACE. WHEN THERE IS NO CALL FOR HEATING OR RE-HEAT IN THE SYSTEM, BOTH BOILERS SHALL BE OFF. IF 140°F CANNOT BE MAINTAINED BY ONE BOILER OVER A 5 MINUTE PERIOD, THE CONTROL VALVE FOR THE REMAINING BOILER SHALL OPEN AND BOTH BOILERS SHALL OPERATE TO MAINTAIN 140°F LEAVING WATER TEMPERATURE. AFTER ONE HOUR OF OPERATION, THE SECOND BOILER SHALL TURN OFF AND IT'S CONTROL VALVE SHALL CLOSE.

PUMP/VALVE/EQUIPMENT SEQUENCE

UPON A CALL FOR SYSTEM OPERATION THE ISOLATION VALVES SHALL OPEN FIRST, THE PUMPS SHALL START SECOND, AND THE EQUIPMENT SHALL START THIRD. THIS SEQUENCE SHALL BE REVERSED FOR SYSTEM

AUTOMATIC DIFFERENTIAL PRESSURE BYPASS VALVES

CHILLED WATER SYSTEM:

A NORMALLY OPEN/POWERED CLOSE, MODULATING, 2-WAY MOTORIZED CONTROL VALVE SHALL BE INSTALLED BETWEEN THE CHILLED WATER SUPPLY AND THE CHILLED WATER RETURN PIPING. UPON A RISE IN CHILLED WATER DIFFERENTIAL PRESSURE WHEN THE CHILLED WATER PUMP IS AT MINIMUM FLOW, THE VALVE SHALL MODULATE OPEN TO MAINTAIN A CONSTANT, PRE-SET DIFFERENTIAL PRESSURE BETWEEN THE CHILLED WATER SUPPLY AND CHILLED WATER RETURN PIPING. IF THE CHILLED WATER PUMP IS NOT AT MINIMUM FLOW, THE VALVE SHALL BE CLOSED. THE VALVE SHALL COMMUNICATE IT'S POSITION TO THE BAS. IF A VALVE IS NOT AT IT'S DESIGNATED POSITION, A VALVE ALARM CONDITION SHALL BE SIGNALED AT THE BAS INTERFACE.

A NORMALLY OPEN/POWERED CLOSE, MODULATING, 2-WAY MOTORIZED CONTROL VALVE SHALL BE INSTALLED BETWEEN THE HOT WATER SUPPLY AND THE HOT WATER RETURN PIPING. UPON A RISE IN HOT WATER DIFFERENTIAL PRESSURE WHEN THE HOT WATER PUMP IS AT MINIMUM FLOW, THE VALVE SHALL MODULATE OPEN TO MAINTAIN A CONSTANT, PRE-SET DIFFERENTIAL PRESSURE BETWEEN THE HOT WATER SUPPLY AND THE HOT WATER RETURN PIPING. IF THE HOT WATER PUMP IS NOT AT MINIMUM FLOW, THE VALVE SHALL BE CLOSED. THE VALVE SHALL COMMUNICATE IT'S POSITION TO THE BAS. IF A VALVE IS NOT AT IT'S DESIGNATED POSITION, A VALVE ALARM CONDITION SHALL BE SIGNALED AT THE BAS INTERFACE.

DETERMINATION OF OCCUPIED & UNOCCUPIED HOURS

OCCUPIED AND UNOCCUPIED HOURS SHALL BE PROGRAMMABLE AT THE BAS BASED ON A 24 HOUR, 365 DAY PROGRAMMABLE SCHEDULE. INITIAL OCCUPIED HOURS SHALL BE 5:00 AM TO 4:00 PM (PROGRAMMABLE AT THE BAS), MONDAY THROUGH FRIDAY. ALL OTHER HOURS SHALL BE UNOCCUPIED. INGALLS HOLIDAY CALENDAR SHALL BE PROGRAMMED AND THOSE FULL DAYS SHALL BE CONSIDERED UNOCCUPIED AS WELL.

A DUCT AIR TEMPERATURE SENSOR SHALL BE INSTALLED DIRECTLY DOWNSTREAM OF THE UNIT. WALL

TEMPERATURE HUMIDITY SENSORS SHALL BE INSTALLED FOR EACH VAV BOX SERVED BY UNIT. THE UNIT FAN SHALL BE EQUIPPED WITH A VFD. A DUCT PRESSURE SENSOR SHALL BE INSTALLED IN THE SUPPLY DUCTWORK, UPSTREAM OF THE VAV BOXES. A BUILDING PRESSURE SENSOR SHALL BE INSTALLED IN EACH ZONE. AN OWNER PROVIDED/CONTRACTOR INSTALLED DUCT SMOKE DETECTOR SHALL BE INSTALLED IN THE RETURN AIR STREAM. A FILTER PRESSURE SENSOR SHALL BE INSTALLED ACROSS THE FILTER. A CONDENSATE OVERFLOW SENSOR SHALL BE INSTALLED IN THE CONDENSATE LINE.

UPON A CALL FOR HEATING, COOLING, OR DEHUMIDIFICATION FROM IT'S ZONE, THE FAN SHALL BE ON. THE FAN SHALL ALSO BE ON IF THE ZONE BUILDING PRESSURE FALLS BELOW NEUTRAL. OTHERWISE, THE FAN SHALL BE OFF. THE FAN SHALL MODULATE TO MAINTAIN A CONSTANT SUPPLY PRESSURE IN THE SYSTEM. UPON DETECTION OF SMOKE, THE FAN SHALL TURN OFF AND AN ALARM SHALL BE SIGNALED AT THE BAS AND AT THE FIRE ALARM SYSTEM.

A NORMALLY OPEN/POWERED CLOSE, MODULATING, 2-WAY MOTORIZED CONTROL VALVE SHALL BE INSTALLED IN THE CHILLED WATER PIPING DIRECTLY DOWNSTREAM OF THE CHILLED WATER COIL. UPON A CALL FOR COOLING OR DEHUMIDIFICATION, BASED ON THE ASSOCIATED ZONE SPACE TEMPERATURE AND HUMIDITY SET POINTS, THE VALVE SHALL MODULATE OPEN TO MAINTAIN 55°F SUPPLY AIR TEMPERATURE. OTHERWISE, IT SHALL REMAIN CLOSED. VALVE POSITION SHALL MAINTAIN BOTH COOLING SUPPLY TEMPERATURE AND SPACE DEHUMIDIFICATION SET POINTS. IF ONE IS SATISFIED BUT NOT THE OTHER, THE VALVE SHALL CONTINUE TO

HOT WATER PRE-HEAT COIL OPERATION:

A NORMALLY CLOSED/POWERED OPEN, MODULATING, 2-WAY MOTORIZED CONTROL VALVE SHALL BE INSTALLED IN THE HOT WATER PIPING DIRECTLY DOWNSTREAM OF THE HOT WATER COIL. IF THE SUPPLY AIR TEMPERATURE FALLS BELOW 55°F, THE VALVE SHALL MODULATE OPEN TO MAINTAIN 55°F SUPPLY AIR TEMPERATURE. OTHERWISE, IT SHALL REMAIN CLOSED.

OUTDOOR & RETURN AIR DAMPERS:

A NORMALLY CLOSED/POWERED OPEN, MODULATING, MOTORIZED VOLUME DAMPER SHALL BE INSTALLED IN THE OUTDOOR AIR DUCTS CONNECTED TO EACH UNIT. A NORMALLY OPEN/POWERED CLOSE, MODULATING, MOTORIZED VOLUME DAMPER SHALL BE INSTALLED IN THE RETURN AIR DUCTS CONNECTED TO EACH UNIT. AT THE MINIMUM FAN SPEED, THE OUTDOOR AIR DAMPER SHALL BE AT A MAXIMUM POSITION AND THE RETURN AIR DAMPER SHALL BE AT A MINIMUM POSITION. AT THE MAXIMUM FAN SPEED, THE OUTDOOR AIR DAMPER SHALL BE AT A MINIMUM POSITION AND THE RETURN AIR DAMPER SHALL BE AT A MAXIMUM POSITION. THE DAMPERS SHALL MODULATE LINEARLY BETWEEN MINIMUM AND MAXIMUM POSITION IN RESPONSE TO THE FAN SPEED. THE OUTDOOR AIR DAMPER SHALL BE CLOSED WHEN THE FAN IS OFF. IF THE ZONE PRESSURE FALLS BELOW NEUTRAL, THE OUTDOOR AIR DAMPER SHALL MODULATE OPEN TO MAINTAIN NEUTRAL OR SLIGHTLY POSITIVE PRESSURE, REGARDLESS OF FAN SPEED.

A FILTER ALARM SHALL SIGNAL AT THE BAS WHEN THE FILTER PRESSURE DROP IS 2 TIMES (ADJUSTABLE) THE INITIAL, CLEAN, PRESSURE DROP. A CONDENSATE ALARM SHALL SIGNAL AT THE BAS WHEN THE OVERFLOW SENSOR IS ACTIVATED.

CONSTANT VOLUME AIR HANDLING UNITS

SENSORS: A DUCT AIR TEMPERATURE SENSOR SHALL BE INSTALLED DIRECTLY DOWNSTREAM OF THE UNIT. WALL TEMPERATURE/HUMIDITY SENSORS SHALL BE INSTALLED THE ZONE SERVED BY UNIT. A BUILDING PRESSURE SENSOR SHALL BE INSTALLED IN EACH ZONE. AN OWNER PROVIDED/CONTRACTOR INSTALLED DUCT SMOKE DETECTOR SHALL BE INSTALLED IN THE RETURN AIR STREAM. A FILTER PRESSURE SENSOR SHALL BE INSTALLED ACROSS THE FILTER. A CONDENSATE OVERFLOW SENSOR SHALL BE INSTALLED IN THE CONDENSATE LINE.

UPON A CALL FOR HEATING, COOLING, OR DEHUMIDIFICATION FROM IT'S ZONE, THE FAN SHALL BE ON. THE FAN SHALL ALSO BE ON IF THE ZONE BUILDING PRESSURE FALLS BELOW NEUTRAL. THE FAN SHALL ALSO BE ON DURING OCCUPIED HOURS. OTHERWISE, THE FAN SHALL BE OFF. UPON DETECTION OF SMOKE, THE FAN SHALL TURN OFF AND AN ALARM SHALL BE SIGNALED AT THE BAS AND AT THE FIRE ALARM SYSTEM. CHILLED WATER COIL OPERATION:

A NORMALLY OPEN/POWERED CLOSE, MODULATING, 2-WAY MOTORIZED CONTROL VALVE SHALL BE INSTALLED IN THE CHILLED WATER PIPING DIRECTLY DOWNSTREAM OF THE CHILLED WATER COIL. UPON A CALL FOR COOLING, BASED ON THE ASSOCIATED ZONE SPACE TEMPERATURE SET POINT, THE VALVE SHALL MODULATE TO MAINTAIN THE SPACE SET POINT TEMPERATURE. UPON A CALL FOR DEHUMIDIFICATION, BASED ON THE ASSOCIATED ZONE SPACE HUMIDITY SET POINTS, THE VALVE SHALL MODULATE OPEN TO MAINTAIN 55°F SUPPLY AIR TEMPERATURE. OTHERWISE, IT SHALL REMAIN CLOSED. VALVE POSITION SHALL MAINTAIN BOTH COOLING SUPPLY TEMPERATURE AND SPACE DEHUMIDIFICATION SET POINTS. IF ONE IS SATISFIED BUT NOT THE OTHER, THE VALVE SHALL CONTINUE TO MODULATE OPEN.

HOT WATER PRE-HEAT COIL OPERATION: A NORMALLY CLOSED/POWERED OPEN, MODULATING, 2-WAY MOTORIZED CONTROL VALVE SHALL BE INSTALLED IN THE HOT WATER PIPING DIRECTLY DOWNSTREAM OF THE HOT WATER COIL. IF THE SUPPLY AIR TEMPERATURE FALLS BELOW 55°F, THE VALVE SHALL MODULATE OPEN TO MAINTAIN 55°F SUPPLY AIR TEMPERATURE. OTHERWISE, IT SHALL REMAIN CLOSED.

HOT WATER RE-HEAT COIL OPERATION: A NORMALLY CLOSED/POWERED OPEN, MODULATING, 2-WAY MOTORIZED CONTROL VALVE SHALL BE INSTALLED IN THE HOT WATER PIPING DIRECTLY DOWNSTREAM OF THE HOT WATER COIL. IF THE COOLING SET POINT IS SATISFIED BUT THE SPACE HUMIDITY IS NOT, THE VALVE SHALL MODULATE OPEN TO MAINTAIN 70°F SUPPLY AIR TEMPERATURE. UPON A CALL FOR HEATING, THE VALVE SHALL MODULATE OPEN TO MAINTAIN THE SPACE TEMPERATURE SET POINT. OTHERWISE, IT SHALL REMAIN CLOSED.

OUTDOOR & RETURN AIR DAMPERS: A NORMALLY CLOSED/POWERED OPEN, MODULATING, MOTORIZED VOLUME DAMPER SHALL BE INSTALLED IN THE OUTDOOR AIR DUCTS CONNECTED TO EACH UNIT. A NORMALLY OPEN/POWERED CLOSE, MODULATING, MOTORIZED VOLUME DAMPER SHALL BE INSTALLED IN THE RETURN AIR DUCTS CONNECTED TO EACH UNIT. THE OUTDOOR AIR DAMPER SHALL BE CLOSED WHEN THE FAN IS OFF. IF THE ZONE PRESSURE FALLS BELOW NEUTRAL, THE OUTDOOR AIR DAMPER SHALL MODULATE OPEN TO MAINTAIN NEUTRAL OR SLIGHTLY POSITIVE PRESSURE. ALARMS:

A FILTER ALARM SHALL SIGNAL AT THE BAS WHEN THE FILTER PRESSURE DROP IS 2 TIMES (ADJUSTABLE) THE INITIAL, CLEAN, PRESSURE DROP. A CONDENSATE ALARM SHALL SIGNAL AT THE BAS WHEN THE OVERFLOW SENSOR IS ACTIVATED.

ALL VAV BOXES SENSORS:

SET POINTS:

A WALL MOUNTED, COMBINATION SPACE TEMPERATURE/HUMIDITY SENSOR SHALL BE INSTALLED FOR EACH UNIT. THE COMBINATION TEMPERATURE/HUMIDITY SENSOR SHALL HAVE A DIGITAL DISPLAY AND MANUAL TEMPERATURE OVERRIDE. THE MAIN SCREEN SHALL DISPLAY THE CURRENT TEMPERATURE, THE COOLING TEMPERATURE SET POINT, AND THE HEATING TEMPERATURE SET POINT. A SUPPLY AIR TEMPERATURE SENSOR SHALL BE INSTALLED DIRECTLY DOWNSTREAM OF EACH UNIT.

SET POINTS SHALL BE MADE AT THE BAS INTERFACE. DURING OCCUPIED HOURS, THE COOLING TEMPERATURE SHALL BE SET TO 75°F AND THE HEATING TEMPERATURE SHALL BE SET TO 68°F. DURING UNOCCUPIED HOURS, THE COOLING TEMPERATURE SHALL BE SET TO 85F AND THE HEATING TEMPERATURE SHALL BE SET TO 62°F. A 3°F MANUAL COOLING OVERRIDE AND A 4°F MANUAL HEATING OVERRIDE SHALL BE ACCESSIBLE BY THE USER AT THE THERMOSTAT DISPLAY. THE MANUAL OVERRIDE SHALL BE ACTIVE FOR A 3 HOUR PERIOD UNLESS THE ZONE BECOMES UNOCCUPIED. THE RELATIVE HUMIDITY SHALL BE SET TO 60% DURING ALL HOURS.

AIR VALVE: UPON A CALL FOR COOLING OR DEHUMIDIFICATION, BASED ON THE ZONE TEMPERATURE AND HUMIDITY SET POINTS, THE AIR VALVE SHALL MODULATE OPEN FROM MINIMUM TO MAXIMUM POSITION TO MAINTAIN SET POINT. VALVE POSITION SHALL MAINTAIN BOTH SPACE COOLING AND SPACE DEHUMIDIFICATION SET POINTS. IF ONE IS SATISFIED BUT NOT THE OTHER, THE VALVE SHALL CONTINUE TO MODULATE OPEN. UPON A CALL FOR HEATING, THE VALVE SHALL MODULATE OPEN FROM MINIMUM TO THE HEATING POSITION. OTHERWISE, IT SHALL REMAIN AT MINIMUM POSITION. VALVE SHALL REMAIN CLOSED DURING UNOCCUPIED HOURS.

HOT WATER RE-HEAT COIL OPERATION: A NORMALLY CLOSED/POWERED OPEN, MODULATING, MOTORIZED CONTROL VALVE SHALL BE INSTALLED IN THE HOT WATER PIPING DIRECTLY DOWNSTREAM OF THE HOT WATER COIL. UPON A CALL FOR HEATING, BASED ON THE ZONE TEMPERATURE SET POINT, THE VALVE SHALL MODULATE OPEN TO MAINTAIN SET POINT. IF THE HEATING OR COOLING SET POINT IS SATISFIED BUT THE HUMIDITY SET POINT IS NOT, THE VALVE SHALL MODULATE OPEN TO MAINTAIN A 70°F SUPPLY AIR TEMPERATURE. OTHERWISE, IT SHALL REMAIN CLOSED.

EXHAUST FANS

EACH EXHAUST FAN SHALL BE STARTED AND STOPPED BY A STARTER SWITCH. THE FANS SHALL OPERATE DURING ALL OCCUPIED HOURS. OTHERWISE, THEY SHALL BE OFF. UPON ACTIVATION, ITS RESPECTIVE EXHAUST AIR DAMPER AND OUTDOOR AIR DAMPER SHALL OPEN. OTHERWISE, THE DAMPERS SHALL BE CLOSED. FAN COIL & CONDENSING UNIT

UNIT SHALL HAVE A FACTORY WALL THERMOSTAT/CONTROLLER. THE BAS SHALL MONITOR/CONTROL ALL AVAILABLE POINTS FROM THE FACTORY CONTROLLER. <u>ALL IG UNITS</u>

ALL ION GENERATOR UNITS SHALL ACTIVATE WITH IT'S RESPECTIVE SUPPLY FAN. OTHERWISE THEY SHALL BE OFF.

CHILLED WATER TEMPERATURE RESET

THE CHILLED WATER SUPPLY TEMPERATURE SET POINT SHALL BE RESET AT A CONTROL INTERVAL OF 5 MINUTES (ADJUSTABLE) AS FOLLOWS:

1. WHEN ALL CHILLED WATER VALVES AT THE AIRSIDE EQUIPMENT SERVED BY THE SYSTEM ARE LESS THAN 75% (ADJUSTABLE) OPEN, THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT SHALL BE RESET UP 0.5°F (ADJUSTABLE). MAXIMUM OF 48°F (ADJUSTABLE). 2. WHEN ANY CHILLED WATER VALVE AT THE AIRSIDE EQUIPMENT SERVED BY THE SYSTEM IS GREATER THAN 90% (ADJUSTABLE) OPEN, THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT SHALL BE RESET TO 42°F.

HOT WATER TEMPERATURE RESET

THE HOT WATER SUPPLY TEMPERATURE SETPOINT SHALL BE RESET AT A CONTROL INTERVAL OF 5 MINUTES (ADJUSTABLE) AS FOLLOWS: 1. WHEN ALL HOT WATER VALVES AT THE EQUIPMENT SERVED BY THE SYSTEM ARE LESS THAN 75%

(ADJUSTABLE) OPEN, THE HOT WATER SUPPLY TEMPERATURE SETPOINT SHALL BE RESET DOWN 0.5°F ADJUSTABLE). MINIMUM OF 125°F. 2. WHEN ANY HOT WATER VALVE AT THE AIRSIDE EQUIPMENT SERVED BY THE SYSTEM IS GREATER THAN 90% (ADJUSTABLE) OPEN, THE HOT WATER SUPPLY TEMPERATURE SETPOINT SHALL BE RESET TO 140°F.

SUPPLY AIR PRESSURE RESET

THE SUPPLY AIR PRESSURE SET POINT SHALL BE RESET AT A CONTROL INTERVAL OF 5 MINUTES (ADJUSTABLE) AS FOLLOWS:

1. WHEN ALL VAV AIR VALVES SERVED BY AN AIR HANDLER ARE LESS THAN 75% (ADJUSTABLE) OPEN, THE AIR PRESSURE SET POINT FOR THAT AIR HANDLER SHALL BE RESET DOWN 0.10 INWG (ADJUSTABLE). 2. WHEN ANY VAV AIR VALVE SERVED BY AN AIR HANDLER IS GREATER THAN 90% (ADJUSTABLE) OPEN, THE

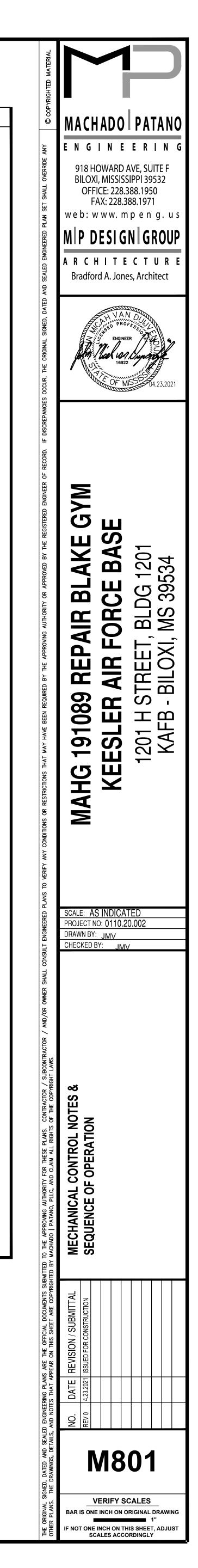
AIR PRESSURE SET POINT FOR THAT AIR HANDLER SHALL BE RESET TO ORIGINAL BALANCE CONDITION. RETURN DUCT MOUNTED SMOKE DETECTORS

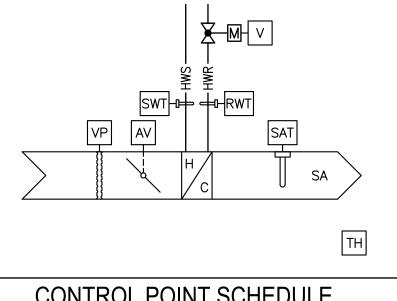
ALL UNITS OVER 2000 CFM SHALL HAVE RETURN DUCT MOUNTED SMOKE DETECTORS PROVIDED BY OWNER AND INSTALLED BY THE CONTROLS CONTRACTOR. CONTROLS CONTRACTOR SHALL VERIFY ALL RETURN DUCT SMOKE DETECTORS ARE COMPATIBLE WITH FIRE ALARM SYSTEM. SMOKE DETECTORS SHALL BE ADDRESSABLE AND ABLE TO BE MONITORED BY FIRE ALARM CONTRACTOR. COORDINATE WITH FIRE ALARM CONTRACTOR AND OWNER. BOILER ROOM AIR QUALITY

A DIGITAL DISPLAY, WALL MOUNTED CARBON MONOXIDE MONITOR SHALL BE INSTALLED IN THE BOILER ROOM (146.1). AN ADJACENT WALL MOUNTED HORN STROBE SHALL BE INSTALLED. THE BAS SHALL MONITOR THE CARBON MONOXIDE LEVEL. THE BAS SHALL SIGNAL AN ALARM, ACTIVATE THE HORN STROBE, AND TURN OFF THE OPERATING BOILER UPON A HIGH CARBON MONOXIDE LEVEL.

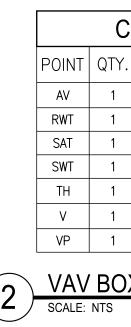
HEAT TRACING (LOCAL CONTROL ONLY)

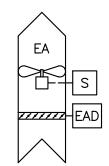
PIPE HEAT TRACING SHALL BE PROVIDED AND INSTALLED FOR THE ABOVE GRADE CHILLED WATER LINES OUTSIDE THE BUILDING (SPECIFICALLY AT THE CHILLERS). HEAT TRACING SHALL PROVIDE 3 WATTS PER LINEAR FOOT OF PIPE. HEAT TRACING SHALL BE PROVIDED WITH FACTORY CONTROLS.





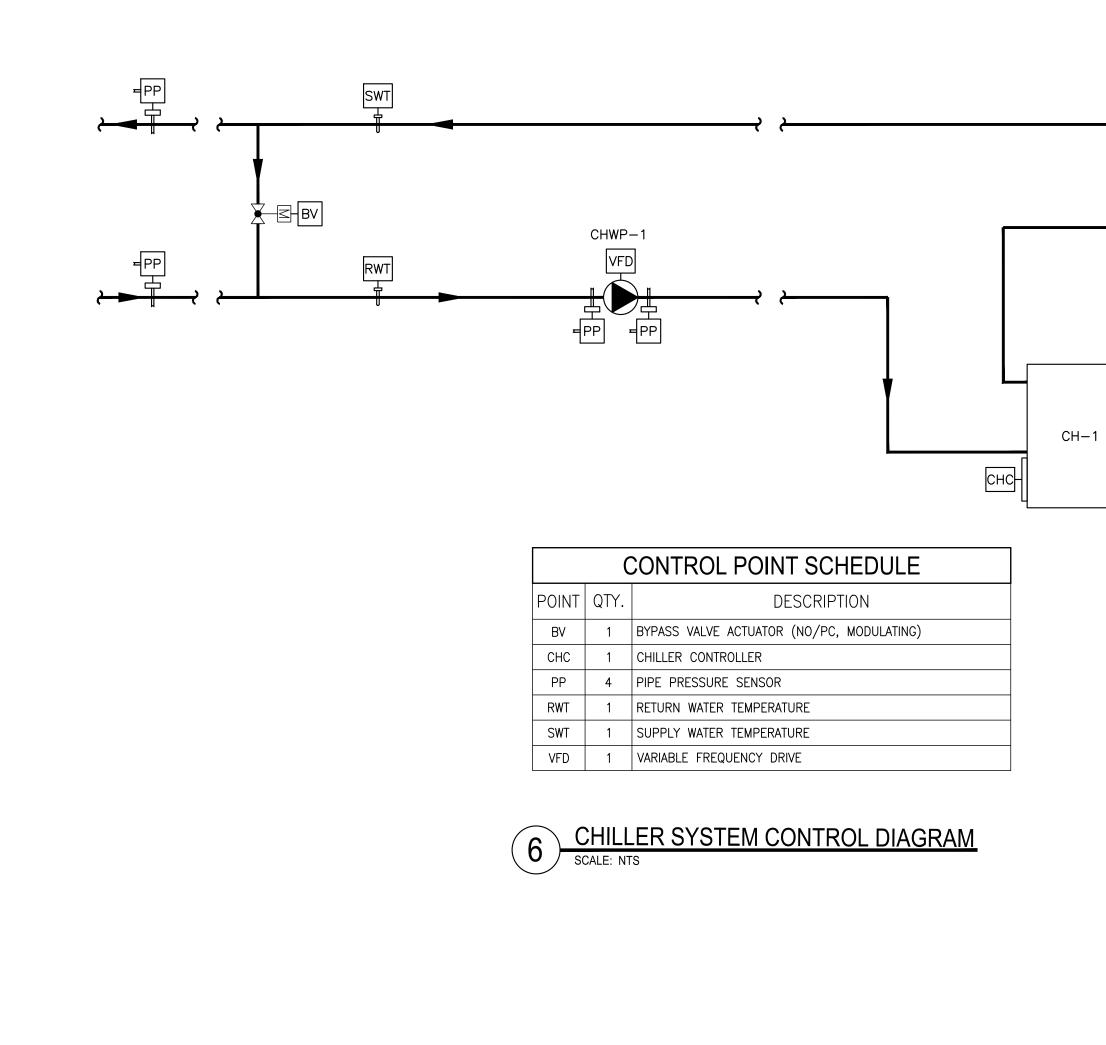
			JNTROL POINT SCHEDULE
	POINT	QTY.	DESCRIPTION
	AV	1	AIR VALVE ACTUATOR (NO/PC, MODULATING)
	RWT	1	RETURN WATER TEMPERATURE SENSOR
	SAT	1	SUPPLY AIR TEMPERATURE SENSOR
	SWT	1	SUPPLY WATER TEMPERATURE SENSOR
	TH	1	SPACE COMBINATION TEMPERATURE/HUMIDITY THERMOSTAT
	V	1	VALVE ACTUATOR (NC/PO, MODULATING)
	VP	1	VELOCITY PRESSURE SENSOR
(1)	VAV SCALE:		CONTROL DIAGRAM (2-WAY VALVE
\smile	SUALE:	0110	

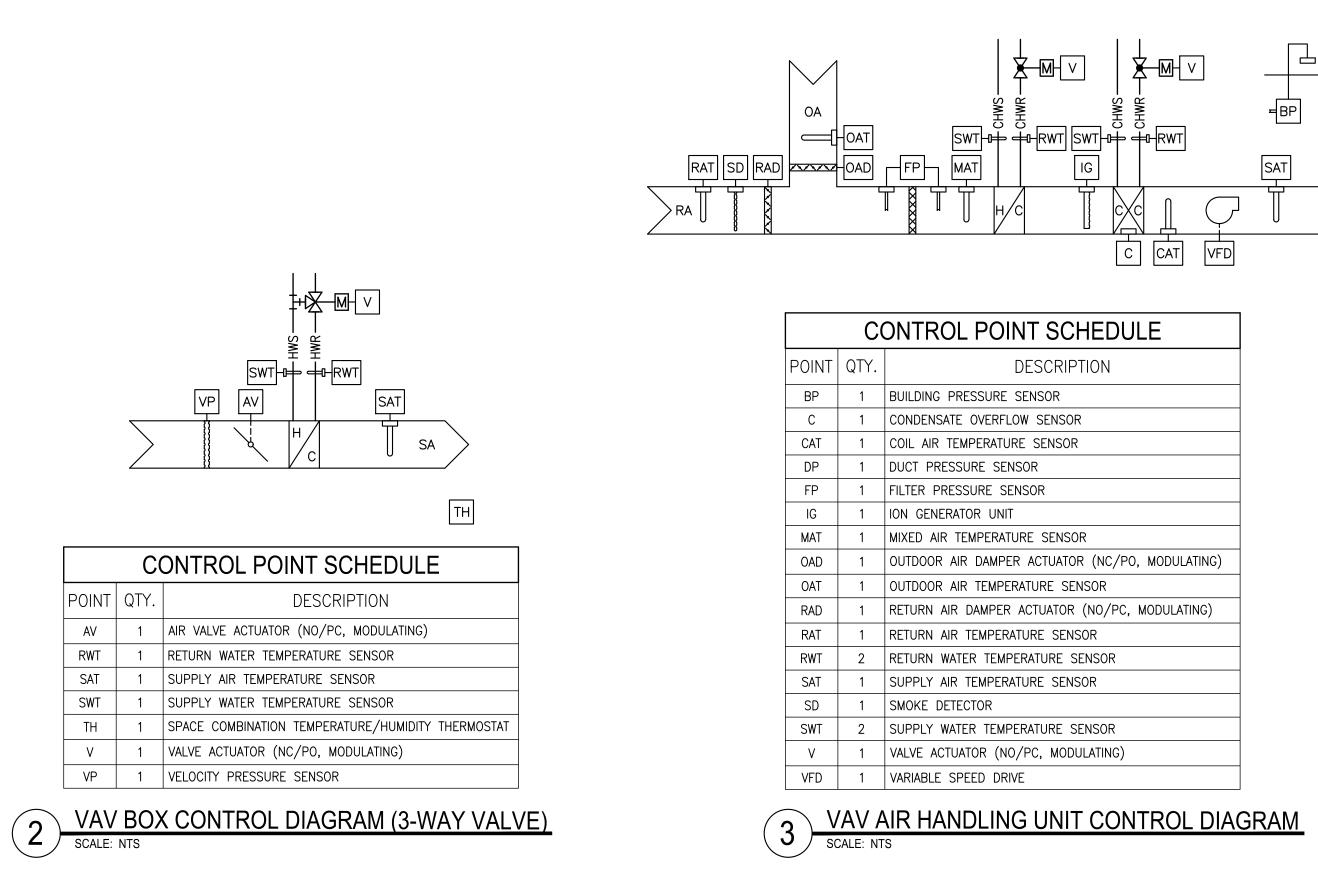


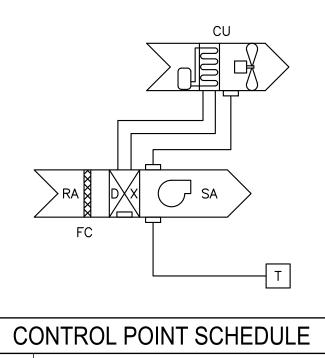


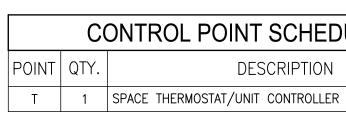
	(CONTROL POINT SCHEDULE
POINT	QTY.	DESCRIPTION
EAD	1	EXHAUST AIR DAMPER ACTUATOR (NO/PC, 2 POSITION)
S	1	STARTER





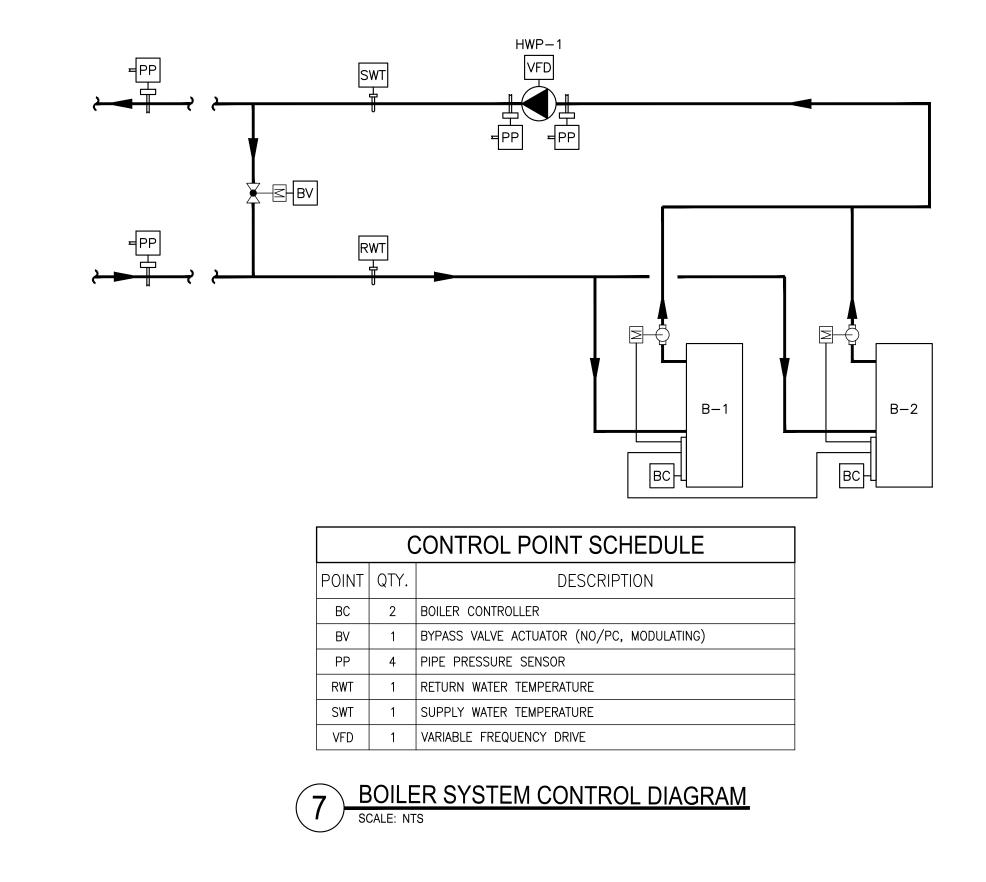




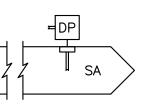


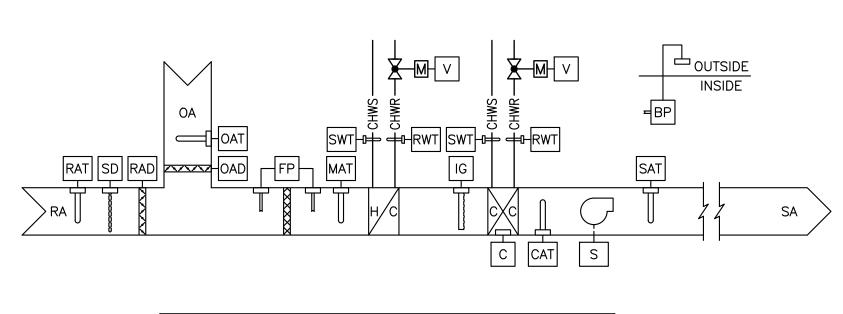
5 FAN COIL & CONDENSING UNIT CONTROL DIAGRAM SCALE: NTS











	CONTROL POINT SCHEDULE								
POINT	QTY.	DESCRIPTION							
BP	1	BUILDING PRESSURE SENSOR							
С	1	CONDENSATE OVERFLOW SENSOR							
CAT	1	COIL AIR TEMPERATURE SENSOR							
FP	1	FILTER PRESSURE SENSOR							
IG	1	ION GENERATOR UNIT							
MAT	1	MIXED AIR TEMPERATURE SENSOR							
OAD	1	OUTDOOR AIR DAMPER ACTUATOR (NC/PO, MODULATING)							
OAT	1	OUTDOOR AIR TEMPERATURE SENSOR							
RAD	1	RETURN AIR DAMPER ACTUATOR (NO/PC, MODULATING)							
RAT	1	RETURN AIR TEMPERATURE SENSOR							
RWT	2	RETURN WATER TEMPERATURE SENSOR							
S	1	STARTER							
SAT	1	SUPPLY AIR TEMPERATURE SENSOR							
SD	1	SMOKE DETECTOR							
SWT	2	SUPPLY WATER TEMPERATURE SENSOR							
V	1	VALVE ACTUATOR (NO/PC, MODULATING)							
		•							



DESCRIPTION

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CONTROL POINT SCHEDULE									
POINT	QTY.	DESCRIPTION							
HS	1	HORN STROBE							
СОМ	1	CARBON MONOXIDE MONITOR							

8 BOILER ROOM AIR QUALITY CONTROL DIAGRAM SCALE: NTS



				LIGHTING SYMBOLS	
C	EILING	;	WALL	DESCRIPTION	
				LED, FLUORESCENT OR H.I.D. LIGHT FIXTURE. LETTER DENOTES FIXTURE TYPE. SEE LUMINARE SCHEDULE.	
			<u> </u>	LED OR FLUORESCENT STRIP LIGHT FIXTURE. LETTER DENOTES FIXTURE TYPE. SEE LUMINARE SCHEDULE	
С)	(\sum	LED OR FLUORESCENT LIGHT FIXTURE. LETTER DENOTES FIXTURE TYPE. SEE LUMINARE SCHEDULE.	
	5	($\overline{\Diamond}$	"EXIT" LIGHT FIXTURE. DIRECTIONAL ARROWS AS INDICATED. SHADED QUADRANT INDICATE FACE(S). SEE LUMINARE SCHEDULE.	
4	<u>}</u>	4		EMERGENCY BATTERY PACK FIXTURE. LETTER DENOTES FIXTURE TYPE. SEE LUMINARE SCHEDULE.	>>
	 			H.I.D.FLOODLIGHT FIXTURE. LETTER DENOTES FIXTURE TYPE. SEE LUMINARE SCHEDULE.	L:1,3
				POWER SYMBOLS	Ē
FLOOR	WALL C	CEIL.	COUNTR	DESCRIPTION	<u>(</u>)
	φ	\bigcirc		DUPLEX OUTLET; GFCI=GFCI PROTECTION, WP=WEATHER PROOF COVER, IG=ISOLATED GROUND.	-
		\bigcirc	•	SPECIAL OUTLET	\$
				480/277V PANELBOARD	\$2
				208/120V PANELBOARD	\$3
]AS/# #	P NR	DISCONNECT SWITCH, AS=FRAME SIZE, AT-FUSE SETTING (NF=NON FUSED), $\#P=NUMBER$ POLES, NR=NEMA ENCLOSURE RATING (NEMA 1	\$ _D
	4] <u>MP/</u> # 	[₽] PNR	UNLESS OTHERWISE NOTED) COMBINATION STARTER/DISCONNECT SWITCH, MP=MAX PROTECTION RATING, SS=STARTER SIZE, #P=NUMBER POLES, NR=NEMA ENCLOSURE	\$ _M
		INR ISS		RATING. MAGNETIC MOTOR STARTER. SS=STARTER SIZE, NR=NEMA ENCLOSURE RATING (NEMA 1 UNLESS OTHERWISE NOTED	\$ _{MS}
	(HF	 _/		MOTOR, SINGLE-PHASE. HP=DENOTES HORSEPOWER	PC
	/			MOTOR, THREE-PHASE. HP=DENOTES HORSEPOWER	-0
 [/ (J)	JUNCTION BOX	
				JUNCTION BOX, WALL MOUNTED	
				TRANSFORMER	ı
FLOOR	R WA	LL	CEIL.	SYSTEM DEVICES DESCRIPTION	
				TELEPHONE OUTLET, FLUSH MOUNTED	
				COMBINATION DATA/TELEPHONE OUTLET, FLUSH MOUNTED	
		7	\bigcirc	CABLE TELEVISION OUTLET, FLUSH MOUNTED	$ \begin{array}{c} $
	Н		(H)	FIRE ALARM, COMBINATION AUDIO/VISUAL ANNUNCIATION UNIT. CANDELA AS INDICATED. WALL MOUNTED 7'-6" AFF UNLESS OTHERWISE NOTED,	
	S	7	S	CEILING MOUNTED. STROBE, WALL MOUNTED 7'-6" AFF UNLESS OTHERWISE NOTED. CEILING MOUNTED CANDELA AS INDICATED.	
	 [P		<u> </u>	FIRE ALARM PULL STATION. WALL MOUNTED 48" AFF.	
				HEAT DETECTOR CEILING MOUNTED.	SP
	(2	_/		SMOKE DETECTOR CEILING MOUNTED.	MC
	DS			DUCT SMOKE DETECTOR, WITH SAMPLING TUBE MOUNTED IN HVAC DUCT.	Sv
	F			FLOW SWITCH	DC
		_		CONTROL MODULE	GB
	 [TS			TAMPER SWITCH	MS
	FA			FIRE ALARM CONTROL PANEL (FACP)	SEC
	(T)			TRANSCEIVER	KP
	AN	IN		FIRE ALARM REMOTE ANNUNCIATOR PANEL.	PRO
	VF	D		VARIABLE FREQUENCY DRIVE	DSP
	ТВ	BB		TELEPHONE BACK BOARD PANEL	L
				LIGHTING CONTROLS	
		_		DESCRIPTION	
	nC 9	P)		OS1 NCM PDT 9 LOW VOLTAGE CEILING MOUNT SENSOR, PASSIVE DUAL TECHNOLOGY, SMALL MOTION/STANDARD RANGE 360° LENS	
	(nC 10	P		OS2 NCM PDT 10 LOW VOLTAGE CEILING MOUNT SENSOR, PASSIVE DUAL TECHNOLOGY, LARGE MOTION/EXTENDED RANGE 360° LENS	
	nCl 10			OS3 NCM 10 LOW VOLTAGE CEILING MOUNT SENSOR, LARGE MOTION/EXTENDED RANGE 360° LENS	
	nF 16))		PP1 NPP16EFP POWER/RELAY PACK, EXTERNAL FAULT PROTECTION	
	\$X PDT			SO1 WSX PDT XX WALL SWITCH SENSOR, PASSIVE DUAL TECHNOLOGY	

NPDOM XX

nPOE

LOW VOLTAGE PUSH BUTTON WALLPOD

WIRING SYMBOLS		ONE-LINE SYMBOLS
DESCRIPTION		DESCRIPTION
WIRING (IN CONDUIT) CONCEALED IN CEILING OR WALL	M	METER ENCLOSURE
WIRING (IN CONDUIT) RUN EXPOSED	M	METER
WIRING UNDERGROUND (SITE WORK)	<u> </u>	CIRCUIT BREAKER
TELECOMMUNICATION RACEWAY (SITE WORK)	0~0	SWITCH, SINGLE POLE-SINGLE THROW
HOMERUN TO PANELBOARD WITH NOMENCLATURE (LETTERS), CIRCUIT NUMBERS (NUMBERS), NUMBER OF CIRCUITS (NUMBER OF ARROWS), EACH CIRCUIT TO HAVE GROUND.		FUSE
	-~-	FUSE
ELECTRICAL MANHOLE	0-11-0	FUSED SWITCH
		FUSED SWITCH
GROUND CONNECTION SINGLE-POLE TOGGLE SWITCH.		DRY TYPE TRANSFORMER
DOUBLE-POLE TOGGLE SWITCH.	PANEL	PANELBOARD
THREE-WAY TOGGLE SWITCH.		
SLIDE DIMMER FLUORESCENT.	3	CURRENT TRANSFORMER
	\mathbb{A}	POTENTIAL TRANSFORMER
SWITCH, MOTOR RATED	LC	LIGHTING CONTACTOR
SWITCH, MOTION SENSOR	GFM	GROUND FAULT MONITORING
PHOTO CELL	К	KIRK-KEY MECHANICAL INTER-LOCK
CONDUIT TURNED UP	۲	GROUND SYSTEM TEST WELL WITH GROUND ROD CONNECTION
CONDUIT STUBBED OUT	- -	EXOTHERMIC WELD GROUND ROD CONNECTION
GROUNDING CONNECTION BAR	•	EXOTHERMIC WELD CONNECTION
10' 3/4" COPPER CLAD GROUND ROD.	1. 1. 1. 1.	4-WAY SF ₆ SWITCH
REFERENCE SYMBOLS	[<u>/. /. /. /. /.</u>]	6-WAY SF ₆ SWITCH
DESCRIPTION		TYPICAL DUAL CIRCUIT AIR BREAK TRANSFORMER DESIGN
SPECIFIC NOTE REFERENCE.	(400A)	TRANSFORMER STATION NUMBER BUILDING NUMBER OR LOCATION
FEEDER REFERENCE.	400A 4400	
DETAIL/SECTION REFERENCE: "1" DENOTES DETAIL "A" DENOTES SECTION "E1" DENOTES DRAWING NUMBER WHERE DETAIL/SECTION IS TAKEN "E2" DENOTES DRAWING NUMBER WHERE DETAIL/SECTION IS DRAWN		LOAD BREAK SF ₆ SWITCH
SPECIAL SYSTEMS		MOTOR STARTER (NUMBER INDICATES NEMA SIZE)
DESCRIPTION	(27)	UNDERVOLTAGE RELAY
SPEAKER. CEILING MOUNT.	V	VOLT METER
FLOOR MOUNTED MICROPHONE OUTLET ACE BACKSTAGE HALF STAGE POCKET OR EQUAL.	A	AMMETER
WALL MOUNTED VOLUME CONTROL 70 VOLT.	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
MAGNETIC DOOR CONTACT. SECURITY SYSTEM		
GLASS BREAK SENSOR. SECURITY SYSTEM		
MOTION DETECTOR. SECURITY SYSTEM.		
SECURITY SYSTEM PANEL.		
KEYPAD SECURITY SYSTEM.		
OVERHEAD PROJECTOR		

OVERHEAD PROJECTOR

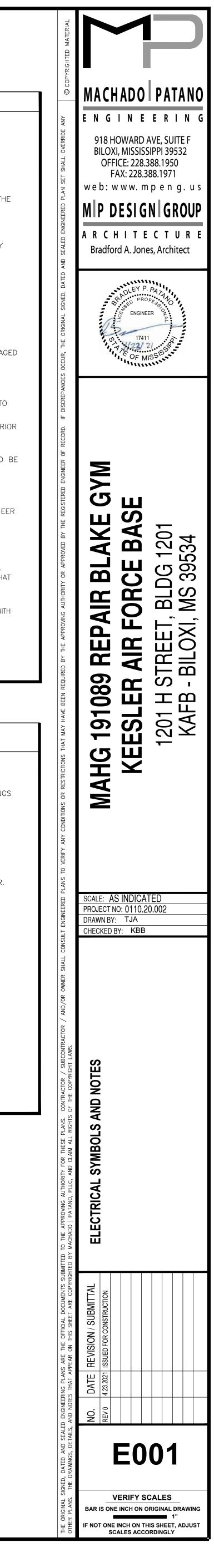
BIAMP RED 1

GENERAL NOTES

- PROVIDE A PERMANENT SIGN ON THE MAIN ELECTRICAL ROOM DOOR TO THE BUILDING STATING THAT THE MAIN SERVICE DISCONNECT(S) ARE LOCATED INSIDE.
- . PLACE SIGNS AT THE MAIN DISCONNECT EQUIPMENT INDICATING TYPE AND LOCATION 3. EQUIPMENT SHALL BE MOUNTED ON MATERIALS SUITABLE FOR THE ENVIRONMENT WHICH IT IS INSTALLED WITH THE APPROPRIATE NEMA ENCLOSURE RATING.
- 4. WORKING CLEARANCES FOR ELECTRICAL EQUIPMENT SHALL BE IN COMPLIANCE WITH NEC ARTICLE 110 AND 408.
- 5. THE DEDICATED ELECTRICAL SPACE EXTENDED FROM THE FLOOR TO THE STRUCTURAL CEILING WITH THE WIDTH AND DEPTH OF THE PANEL-BOARD OR SWITCHBOARD, MUST BE CLEAR OF ALL PIPING, DUCTS, EQUIPMENT FOREIGN TO THE ELECTRICAL OR ARCHITECTURAL APPURTENANCES IN ACCORDANCE WITH THE NEC 110 & 408. COORDINATE INSTALLATION OF ELECTRICAL EQUIPMENT WITH OTHER TRADES PRIOR TO ROUGHING IN EQUIPMENT.
- ALL ELECTRICAL EQUIPMENT AND THE RESULTANT INSTALLATION OF SUCH EQUIPMENT, DEVICES, ETC., SHALL BE IN STRICT COMPLIANCE WITH THE NATIONAL ELECTRIC CODE, NFPA 70, ALL APPLICABLE LOCAL, STATE AND FEDERAL CODES AND THE STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE NFPA 70E.
- DRAWINGS AND SPECIFICATIONS FORM A COMPLETE SET OF DOCUMENTS FOR THE WORK IN THIS PROJECT. NEITHER IS COMPLETE WITHOUT THE OTHER. ANY ITEM MENTIONED IN ONE SHALL BE BINDING AS MENTIONED IN BOTH. CONTRACTOR SHALL TAKE RESPONSIBILITY FOR FIELD VERIFICATION OF ALL DIMENSIONS AND LOCATIONS OF EXISTING, RELOCATED AND NEW EQUIPMENT AND
- SHALL BE RESPONSIBLE FOR COORDINATION WITH THE WORK OF OTHER TRADES NECESSARY TO THE PROJECT. 9. THESE DRAWINGS ARE INTENDED TO OUTLINE THE SCOPE OF WORK REQUIRED TO PROVIDE A COMPLETE AND OPERABLE PROJECT CONCLUSION. ALL MISCELLANEOUS COMPONENTS, PARTS, FASTENERS, SPLICES AND OTHER INCIDENTAL ITEMS NECESSARY TO PROVIDE A COMPLETED PROJECT SHALL BE PROVIDED WHETHER OR NOT SPECIFICALLY NOTED.
- 10. CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY CONFLICTS ARISING FROM DISCOVERED CONDITIONS AT ANY PHASE OF THE PROJECT.
- 11. CONTRACTOR SHALL NOTIFY KAFB CONTRACTING OFFICER TO DETERMINE THE LOCATION AND DEPTH OF UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
- 12. AT ANY LOCATION WHERE EXCAVATION OR ASSOCIATED WORK CAUSES DAMAGE TO EXISTING UNDERGROUND UTILITIES, CONTRACTOR SHALL RESTORE THE DAMAGED SYSTEM TO LIKE-NEW STATE. 13. ALL BRANCH CIRCUITS SHALL HAVE A SEPARATE NEUTRAL AND GROUND.
- 14. ALL ABOVE GROUND EXPOSED CONDUIT SHALL BE RIGID GALVANIZED STEEL.
- 15. LOCATIONS OF OTHER EQUIPMENT SPECIFIED BY OTHER TRADES OR PROVIDED BY OWNER ARE APPROXIMATE. COORDINATE EXACT LOCATION IN FIELD PRIOR TO ROUGHING IN AND ROUTING CONDUIT.
- 16. SEE ARCHITECTURAL REFLECTED CEILING PLANS AND ELEVATIONS FOR EXACT LOCATIONS FOR LIGHT FIXTURES IN LAY-IN OR DRYWALL CEILINGS, AND ON INTERIOR OR EXTERIOR WALLS.
- 7. CONDUITS ARE NOT NECESSARILY SHOWN ON PLAN DRAWINGS FOR SAKE OF CLARITY. PROVIDE CONDUITS BETWEEN DEVICES AND TO PANELS PER REQUIREMENTS LISTED IN DIVISION 26 SPECIFICATIONS. INDICATE EXACT ROUTING OF CONDUIT ON PLAN DRAWINGS AS PART OF AS BUILD DOCUMENTATION TO BE SUBMITTED AFTER FINAL COMPLETION.
- 18. FINAL CONNECTION TO ALL MOTORS SHALL BE WITH FLEXIBLE CONDUIT CONNECTION.
- 19. ALL EXIT, NIGHT LIGHT, AND EMERGENCY FIXTURES SHALL BE CONNECTED TO LIGHT CIRCUIT AHEAD OF LOCAL SWITCH.
- 20. GENERAL CONTRACTOR SHALL FIELD-VERIFY ALL EXISTING CONDITIONS PRIOR TO BEGINNING ANY WORK AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCIES. FAILURE TO DO SO INDICATES THAT THE CONTRACTOR ACCEPTS THE CONDITIONS AS THEY EXIST, AND SHALL PERFORM THE WORK REQUIRED AS SHOWN AND SPECIFIED.
- 21. ELECTRICAL CONTRACTOR SHALL REVIEW MECHANICAL DRAWINGS AND SPECIFICATION TO OBTAIN LOCATIONS, WIRING REQUIREMENTS, CONTROL WIRING SCHEMES, INTERLOCK WIRING AND THERMOSTAT LOCATIONS.
- 22. ALL DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO QUANTIFY THE MATERIALS SPECIFIED AND INDICATED THEIR INTENDED RELATIONSHIP TO EACH OTHER. THE DRAWINGS ARE NOT TO BE SCALED. THE VARIOUS SCALES USED ON THE DRAWINGS MAY NOT ALLOW FOR ALL FITTINGS, OFFSETS, AND ACCESSORIES THAT MAY BE REQUIRED TO COMPLETE THE WORK. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE CONDITIONS THAT WOULD AFFECT THE WORK TO BE PERFORMED AND SHALL ARRANGE SUCH WORK AS NECESSARY TO COMPLY WITH THE INTENT OF THE CONSTRUCTION DOCUMENTS.
- 23. ALL OPERABLE WALL MOUNTED DEVICES (SWITCHES, PULL STATIONS, ETC.) SHALL BE INSTALLED SO THAT THE OPERABLE COMPONENT IS A MAXIMUM OF 48" AFF AND IN ACCORDANCE WITH ADA AND ABA STANDARDS.

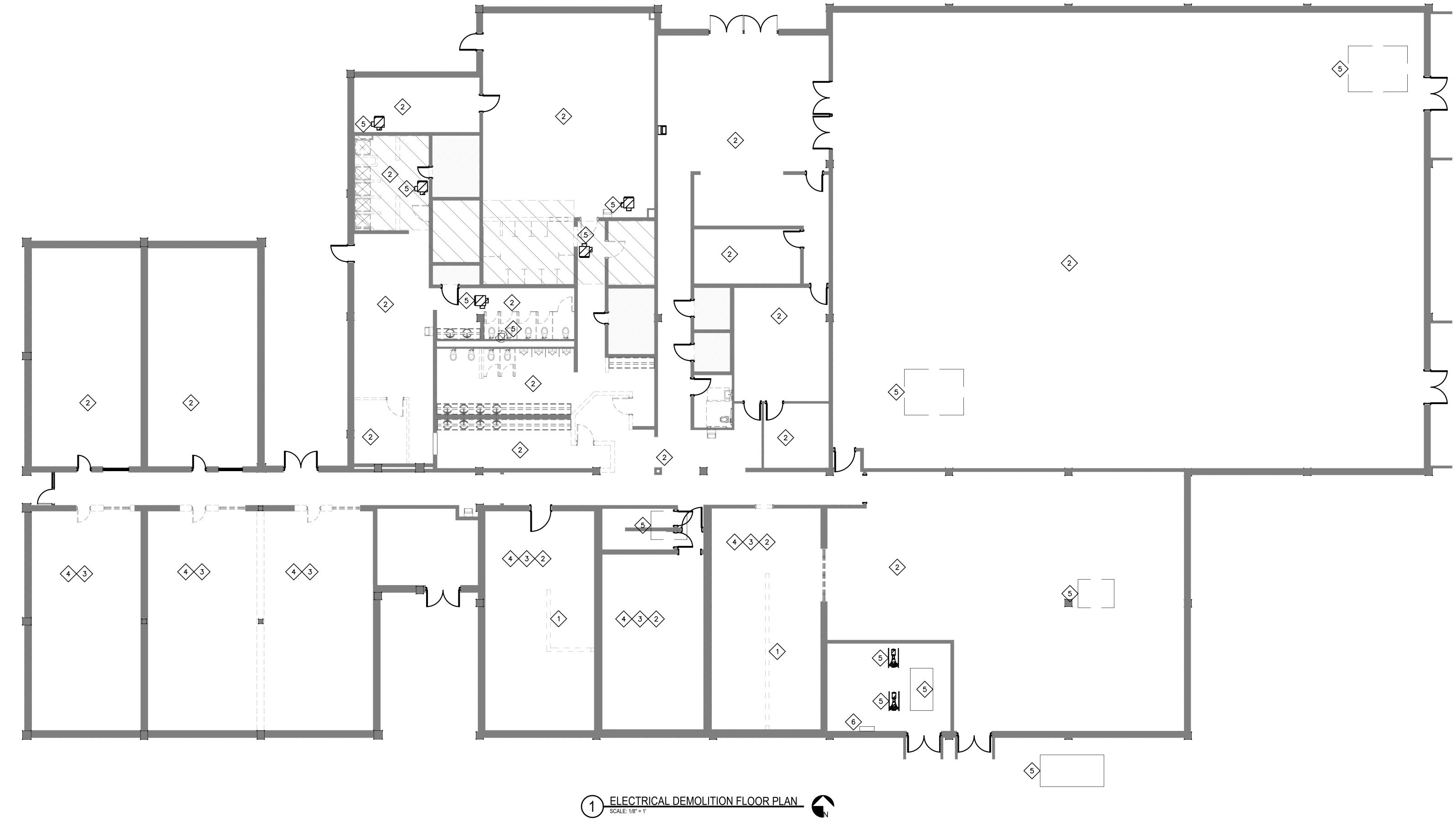
GENERAL FIRE ALARM NOTES

- . THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MATERIALS, EQUIPMENT, SOFTWARE AND PROGRAMMING NECESSARY FOR A COMPLETE AND FUNCTIONAL ADDRESSABLE FIRE ALARM SYSTEM. 2. ALL WORK SHALL COMPLY WITH THE CURRENT EDITIONS OF NFPA 70, 70E, 72, 90A, 101. FIRE ALARM SYSTEM IS A DELEGATED DESIGN ITEM. THESE DRAWINGS
- SHOW GENERAL INTENT. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL DEVICES REQUIRED FOR A CODE COMPLIANT SYSTEM WHETHER SHOWN ON THESE DRAWINGS OR NOT.
- 3. ALL CABLES SHALL BE IDENTIFIED WITH A PERMANENT LABEL AT THE DEVICE AND INSIDE THE FIRE ALARM PANEL.
- 4. ALL WIRING SHALL BE CONTINUOUS AND UNBROKEN FROM THE PANEL TO THE FIRST DEVICE AND FROM DEVICE TO DEVICE. 5. ALL DETECTOR AND CONTROL DEVICE WIRING SHALL BE FPLP OR EQUAL AND 16 AWG MINIMUM.
- 6. ALL WIRING SHALL BE RUN IN MINIMUM 3/4" RED EMT. ALL EMT AND JUNCTION BOXES SHALL BE FACTORY PAINTED RED.
- 7. SUBMITTED SHOP DRAWINGS SHALL SHOW THE ACTUAL PROGRAMMING ADDRESS. THE ADDRESS SHALL IDENTIFY THE LOOP NUMBER AND THE DEVICE NUMBER. EACH DEVICE SHALL HAVE ITS ADDRESS PLACED ON THE BODY OF THE DEVICE VIA PRINTED LABEL WITH CHARACTERS 1/8" HIGH MINIMUM. 8. ALL STROBES SHALL BE SYNCHRONIZED IN ACCORDANCE WITH THE NATIONAL FIRE ALARM CODE, NFPA 72.
- 9. UNLESS OTHERWISE NOTED ALL HORNS SHALL BE SET TO PROVIDE A MINIMUM OF 95 DB @ 10 FEET. STROBES SHALL BE SET AS NOTED. THE HORN/STROBES SHALL BE WALL MOUNTED AT 80" TO 96" AFF OR 6" BELOW THE CEILING, WHICHEVER IS LOWER OR AS INDICATED ON THE DRAWINGS.
- 10. MOUNTING HEIGHTS SHALL BE COORDINATED WITH OTHER DISCIPLINES, AVOID BLOCKING DEVICES WITH OTHER EQUIPMENT.
- 11. ADDRESSABLE LOOPS SHALL BE PROGRAMMED TO 80% MAXIMUM.
- 12. NAC CIRCUITS SHALL BE WIRED CLASS A. SEPARATE NAC CIRCUITS ARE REQUIRED FOR AUDIBLE AND VISIBLE DEVICES. 13. PROVIDE VISIBLE NOTIFICATION DEVICES IN ALL MECHANICAL ROOMS WITH HIGH AMBIENT NOISE CONDITIONS.
- 14. NO "T" TAPPING WILL BE ALLOWED.
- 15. PROVIDE DUCT DETECTORS IN ALL AIR HANDLING UNITS PER NFPA 72. DUCT DETECTORS THAT ARE NOT READILY ACCESSIBLE SHALL BE PROVIDED WITH A REMOTE INDICATOR AND TEST SWITCH. READILY ACCESSIBLE SHALL BE DEFINED AS A LOCATION THAT DOES NOT REQUIRE A LADDER OR SPECIAL LIFTING EQUIPMENT FOR ACCESS TO THE DEVICE. DUCT DETECTORS REQUIRING SPECIAL LIFTING EQUIPMENT FOR ACCESS AND MAINTENANCE SHALL BE SPECIFICALLY AVOIDED.
- 22. REFERENCE MECHANICAL HVAC DRAWINGS. PROVIDE SMOKE DUCT DETECTOR WITHIN 5' OF EACH SMOKE OR FIRE/SMOKE DAMPER.
- 23. REFERENCE MECHANICAL HVAC DRAWINGS. ELECTRICAL CONTRACTOR SHALL PROVIDE 120V POWER TO ALL SMOKE DAMPERS.
- 24. COORDINATE WITH OTHER TRADES. MAINTAIN 3' SEPARATION BETWEEN SMOKE DETECTORS AND HVAC DIFFUSERS.



						LUMINARE	SCHEDULE <			
		ABBREVIATIONS		ר	TAG NOTES DESCRIPTION	CATALOG	VOLTAGE	LAMP	CATALOG NUMBER	
A	F			-	F1 1.2 2'X4' LED TROFFER	LITHONIA LIGHTING 2BLT4 SERIES	120	LED 38W	2BLT4 48L ADP MVOLT GZ10 LP835 USPOM	
A AMPERE(S) AC ALTERNATING CURRENT	EEB ELECTRICAL EQUIPMENT BUILDING	KCMILTHOUSAND CIRCULAR MILSØPHASEKVKILOVOLTPNLPANELKVAKILOVOLT.AMPERESPRPAIR	UG UNDERGROUND UL UNDERWRITER'S LABORATORIES		6" ROUND LED DOWN LIGHT	LITHONIA LIGHTING	120	LED 6W	LDN6 35/05 LO6AR LSS MVOLT GZ10	
A/CAIR CONDITIONINGAFAMPERE FRAMEAFFABOVE FINISHED FLOORAFGABOVE FINISHED GRADE	EL ELEVATION EM EMERGENCY ESD EMERGENCY SHUTDOWN	KW KILOWATT PE PHOTO ELECTRIC L PRI PRIMARY PIR PASSIVE INFRAR			F2 1,2	LDN6 SERIES				
AIG ADOVE THISTIED GRADE AIC AMPERES INTERRUPTING CAPACITY ALUM ALUMINUM AT AMPERE TRIP	EWC ELECTRIC WATER COOLER EXIST EXISTING	LBS.POUNDSPTPOTENTIAL TRANLEVLEVELPTPOLYVINYL CHLCLTG.LIGHTINGPVCPOLYVINYL CHLCLVLOW VOLTAGEPWRPOWER	SFORMER VAC VOLTAGE, ALTERNATING CURRENT		F3 1,2 2'X4' LED TROFFER	LITHONIA LIGHTING 2GTL SERIES	120	LED 23.3W	2GTL 4 30L A19 MVOLT GZ10 LP835 USPOM	
AWG AMERICAN WIRE GAGE AHU AIR HANDLING UNIT	F FC FOOT CANDLE FF FINISHED FLOOR FLA FULL LOAD AMPS	MCB MAIN CIRCUIT BREAKER REC RECEPTACLE	W WATTS, WIRE, WIDTH WP WEATHERPROOF		F4 1,2 4' VANITY LIGHT	LITHONIA LIGHTING VANITY LED SERIES	120	LED 18.7W	WL4 22L GZ10 LP835 EL7L USPOM	
C CONDUIT CB CIRCUIT BREAKER CKT CIRCUIT	FL FLUORESCENT FREQ. FREQUENCY FT. FOOT; FEET	MISCMISCELLANEOUSREQ'D.REQUIREDMLOMAIN LUGS ONLYRGSRIGID GALVANIZEMTDMOUNTEDRMROOMMHMOUNTING HEIGHTRTRAINTIGHT	D STEEL X XFMR TRANSFORMER		F5 1,2 2'X2' LED TROFFER	LITHONIA LIGHTING 2BLT2 SERIES	120	LED 16.64W	2BLT2 20L ADP MVOLT GZ10 LP835 USPOM	
CL CLASS COND CONDUCTOR(S) CT CURRENT TRANSFORMER	G GROUND GALV GALVANIZED GFI GROUND FAULT INTERRUPTER	N NEUTRAL SEC SECONDARY NEC NATIONAL ELECTRICAL CODE SMK SMOKE			F6 1,2 2'X4' LED TROFFER	LITHONIA LIGHTING 2GTL SERIES	120	LED 30W	2GTL 4 40L A19 MVOLT GZ10 LP835 USPOM	
CU COPPER COMM COMMUNICATION CWP CHILLED WATER PUMP	GND GROUND H HP HORSEPOWER	N.C.NORMALLY CLOSEDSPCSINGLE POINT (N.O.NORMALLY OPENSRSUNRISENFNONFUSEDSSSUNSETNFPANATIONAL FIRE PROTECTION ASSOCIATIONSTDSTANDARD	CONNECTION		F7 1,2,3 6" ROUND LED DOWN LIGHT	GOTHAM LIGHTING EVO SERIES	120	LED 19.7W	EVO6SH 35/20 DFF SOL MVOLT EZ10	
D DC DIRECT CURRENT DET. DETECTOR	HPS HICH PRESSURE SODIUM	NL UN SWITCHED NIGHT LIGHT SUPVR SUPERVISORY NTS NOT TO SCALE SWBD SWITCHBOARD			F8 1,2 2' VANITY LIGHT	LITHONIA LIGHTING VANITY LED SERIES	120	LED 18.7W	WL2 22L GZ10 LP835 USPOM	
	J JB JUNCTION BOX	OCON CENTERTOLOVERLOAD CONTACTTYPTYPICAL			X 2 LED EDGE-LIT RED EXIT SIGN, CEIL MOUNTED	ING LITHONIA LIGHTING EDGR SERIES	120	LED	EDGR 1 OR 2 R EL	
			l							
	ACITY DASED ON (75° TEMP, DATING) IN RIGHT METAL CONDUCT		DEMOLITION	NOTES						
WET EXTERIOR LOCATIONS: RGS WITH CAST FITTINGS	ACITY BASED ON (75° TEMP. RATING) IN RIGID METAL CONDUI SION FITTINGS		1. PLANS DO NOT ATTEMPT TO SHOW ALL DEMOLITION ITE EXIT LIGHTS, RECEPTACLES, TELEPHONE, DATA, MISC. C	·						
UNDERGROUND INSTALLATIONS: SCHEDULE 80 PVC BASED ON 31% FILL CAPACITIES			PAGING/INTERCOM, NURSE CALL, SECURITY, ETC.) AR GENERAL LAYOUT IN THESE AREAS TO BE RENOVATED.		LUMINARE SCHEDULE NOTES					
3PH+G	3PH+N+G	2 WIRE + GND. OR	NECESSARILY COMPLETE, ELECTRICAL CONTRACTOR (E.C PROVIDE REMOVAL OF ALL DEVICES ACCORDINGLY. SE	,	1. CONTRACTOR SHALL COORDINATE FIXTURE TRI					
FEEDER DESIGNATION FEEDER DESIGNATION PHASE + GND. CONDUCTORS AND CONDUIT SIZE	FEEDER DESIGNATION FEEDER CONDUCTORS AND CONDUIT SIZE	D. 1 WIRE + NEUTRAL + GND. FEEDER CONDUCTORS AND DESIGNATION CONDUIT SIZE	NON-DEMOLITION AREAS. 2. E.C. SHALL REMOVE ALL EXISTING LIGHT FIXTURES, SW	ITCHES/DIMMERS EXIT LIGHTS	WARRANTY. TEST SWITCH SHALL BE FIXTURE FIXTURES WITH BATTERY PACKS REQUIRE A SI	MOUNTED FOR ALL LOCATIONS,	EXTERIOR FIXTUR	E TEST SWITCHE	H ACCESSIBLE SELF TEST SWITCH. WITH 5 YEAR IS SHALL BE WEATHERPROOF. ALL LIGHTING SCONNECTING POWER TO BATTERY PACKS WILL	
DESIGNATION	DESIGNATION	DESIGNATION	RECEPTACLES, TELEPHONE, DATA, MISC. OUTLETS, WIRIN COMMUNICATION DEVICES (FIRE ALARM, PAGING/INTERCO	NG TROUGHS, DUCTS, FILM ILLUMINATORS,					ONTRACTOR SHALL PROVIDE AN APPROPRIATELY	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	20N 4#12+#12 GND., 3/4"C	20S) 2#12+#12 GND., 3/4"C	REMOVE CONDUIT/WIRE BACK TO PANEL(S) UNLESS RE	-USED FOR NEW AND/OR RELOCATED WORKS.	3. UL LISTED AND APPROVED FOR WET LOCATION	IS.				
30 3#10+#10 GND., 3/4"C 50 3#8+#10 GND., 1"C	30N 4#10+#10 GND., 3/4"C 50N 4#8+#10 GND., 1"C	30S 2#10+#10 GND., 3/4"C 50S 2#8+#10 GND., 1"C	EXISTING RACEWAYS, CONDUITS AND CABLE DUCTS WITH LOADS MAY BE RE-USED. SIMILARLY FOR COMMUNICA	,						
65 3#6+#8 GND., 1"C	65N 4#6+#8 GND., 1 1/4"C	65S 2#6+#8 GND., 1"C	CONTROL PANEL(S) IF NOT RE–USED). FIXTURES NOT A LOCATION TO BE SPECIFIED BY OWNER. ALL FIXTUR							
85 3#4+#8 GND., 1 1/4"C	85N 4#4+#8 GND., 1 1/4"C	85S) 2#4+#8 GND., 1 1/4"C	FIXTURES AND ON THE SAME CIRCUITS SHALL BE RECO CONDUIT/WIRE AS REQUIRED.	ONNECTED TO MAINTAIN SERVICE, PROVIDE NEW						
(100) 3#3+#8 GND., 1 1/4"C	(100N) 4#3+#8 GND., 1 1/2"C	(100S) 2#3+#8 GND., 1 1/4"C	3. DAMAGE TO EXISTING MATERIALS/EQUIPMENT WILL BE F	REPAIRED AT NO ADDITIONAL COST TO						
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	OWNER. RE-SUPPORT ANY REMAINING CONDUIT OR D							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c c} \hline (130N) & 4\#1+\#6 \text{ GND., } 2\text{"C} \\ \hline (150N) & 4\#1/0+\#6 \text{ GND., } 2\text{"C} \\ \hline \end{array}$	130S 2#1+#6 GND., 1 1/2"C 150S 2#1/0+#6 GND., 2"C	WALLS/MILLWORK BEING REMOVED. 4. NON-DEMOLITION AREAS: DEMOLITION WORKS SHALL N			DRAWING E002 S	SPECIFIC NO	TES		
150 3#1/0+#6 GND., 2"C 175 3#2/0+#6 GND., 2"C	(150N) 4#1/0+#6 GND., 2"C (175N) 4#2/0+#6 GND., 2 1/2"C	(1303) 2#1/0+#6 GND., 2°C	DEMOLITION. E.C. SHALL BE RESPONSIBLE FOR THE C							
200) 3#3/0+#6 GND., 2"C	(200N) 4#3/0+#6 GND., 2 1/2"C	(200S) 2#3/0+#6 GND., 2"C	FIRE ALARM, DATA, PAGING, INTERCOM, ETC.) IN NON-I MAINTAINED AT ALL TIMES. E.C. SHALL MAINTAIN SERV		CONTRACTOR SHALL COORDINATE ALL FIXTUR	E MOUNTING HEIGHTS WITH THE	ARCHILLCIURAL PI	LANS PRIOR TO	ROUGHING IN.	
230) 3#4/0+#4 GND., 2 1/2"C	(230N) 4#4/0+#4 GND., 3"C	(230S) 2#4/0+#4 GND., 2 1/2"C	RECONNECTING ANY CIRCUITS AFFECTED BY DEMOLITION	,						
255) 3#250+#4 GND., 2 1/2"C	(255N) 4#250+#4 GND., 3"C	(255S) 2#250+#4 GND., 2 1/2"C	5. E.C SHALL FIELD INVESTIGATE EXISTING ELECTRICAL INS THE RENOVATION AREAS THAT ARE TO REMAIN BUT AR							
285) 3#300+#4 GND., 3"C	(285N) 4#300+#4 GND., 3"C	(285S) 2#300+#4 GND., 3"C	CODES SHALL BE CORRECTED BY E.C., INCLUDING BUT							
310 3#350+#3 GND., 3"C	<u>(310N)</u> 4#350+#3 GND., 4"C	<u>(310S)</u> 2#350+#3 GND., 3"C	UN-SUPPORTED CONDUIT AND JUNCTION BOXES LAYING							
(335) 3#400+#3 GND., 3"C	(335N) 4#400+#3 GND., 4"C	(335S) 2#400+#3 GND., 4"C	JUNCTION BOXES SUPPORTED ONLY BY TIE-WIRE - R/ SPECS. PROVIDE NEW CONDUIT/WIRE AS REQUIRED.	AISE AND SUPPORT CUNDUIT WITH STRAP PER						
(380) $3#500+#3$ GND., 4 "C	(380N) 4#500+#3 GND., 4"C	<u>380S</u> 2#500+#3 GND., 4"C	CIRCUITS WITHOUT A SEPARATE GREEN GROUNDING WIR							
400 2 SETS(3#3/0+#3 GND., 2"C) 420 3#600+#2 GND., 4"C	(400N) 2 SETS(4#3/0+#3 GND., 2 1 (420N) 4#600+#2 GND., 4"C		EVERY RECEPTACLE OUTLET AND DEVICES. INSTALLATION THE REMOVAL AND RE-INSTALLATION OF THE EXISTING							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	(460N) 2 SETS(4#4/0+#2 GND., 2 1)	/2"C)	FIXTURES IMPROPERLY SUPPORTED OR INADEQUATELY S							
510 2 SETS(3#250+#1 GND., 2 1/2			SUPPORT PER N.E.C.							
570) 2 SETS(3#300+#4 GND., 2 1/2)	EMERGENCY AND NORMAL POWER CIRCUITS IN THE SAME EMERGENCY AND NORMAL CIRCUITS AND INSTALL IN SE							
620) 2 SETS(3#350+#1/0 GND., 3"C	C) (620N) 2 SETS(4#350+#1/0 GND., 3	5°C)	6. ALL EXISTING ABANDONED AND/OR UN-USED CONDUIT,							
760) 2 SETS(3#500+#1/0 GND., 3"C			BOXES, COMMUNICATION SYSTEM AND DEVICES IN PROM AND/OR CONTROL PANELS. ALL ITEMS DEMOLISHED B							
840 2 SETS(3#600+#2/0 GND., 4"C			AND/OR CONTROL PANELS.							
(855) 3 SETS(3#300+#2/0 GND., 2 1			7. SEE ARCHITECTURAL DRAWINGS FOR ADDITIONAL SCOPE							
(1005) 3 SETS $(3#400+#3/0 GND., 3"C)$			8. ALL WORK SHALL BE DONE IN TOTAL COORDINATION W STAFF TO AVOID ANY INTERRUPTION TO EXISTING CIRCU							
(1240) 4 SETS $(3\#350+\#4/0 \text{ GND.}, 3^{\circ}C)$			9. ALL OPENINGS IN PARTITIONS AND CEILING SHALL BE							
(1650) 5 SETS $(3#400+#250$ GND., 3"C)			10. CONTRACTOR TO PROVIDE OSHA APPROVED TEMPORARY							
(2010) 6 SETS(3#400+#350 GND., 3"C (2660) 7 SETS(3#500+#450 GND., 4"C			DURATION OF THE PROJECT.							
(2860) 7 SETS(3#500+#450 GND., 4°C) $(3040) 8 SETS(3#500+#500 GND., 4°C)$										
	C) (4180N) 11 SETS(4#500+#700 GND.,									
	, <u>, , , , , , , , , , , , , , , , , , </u>		4							

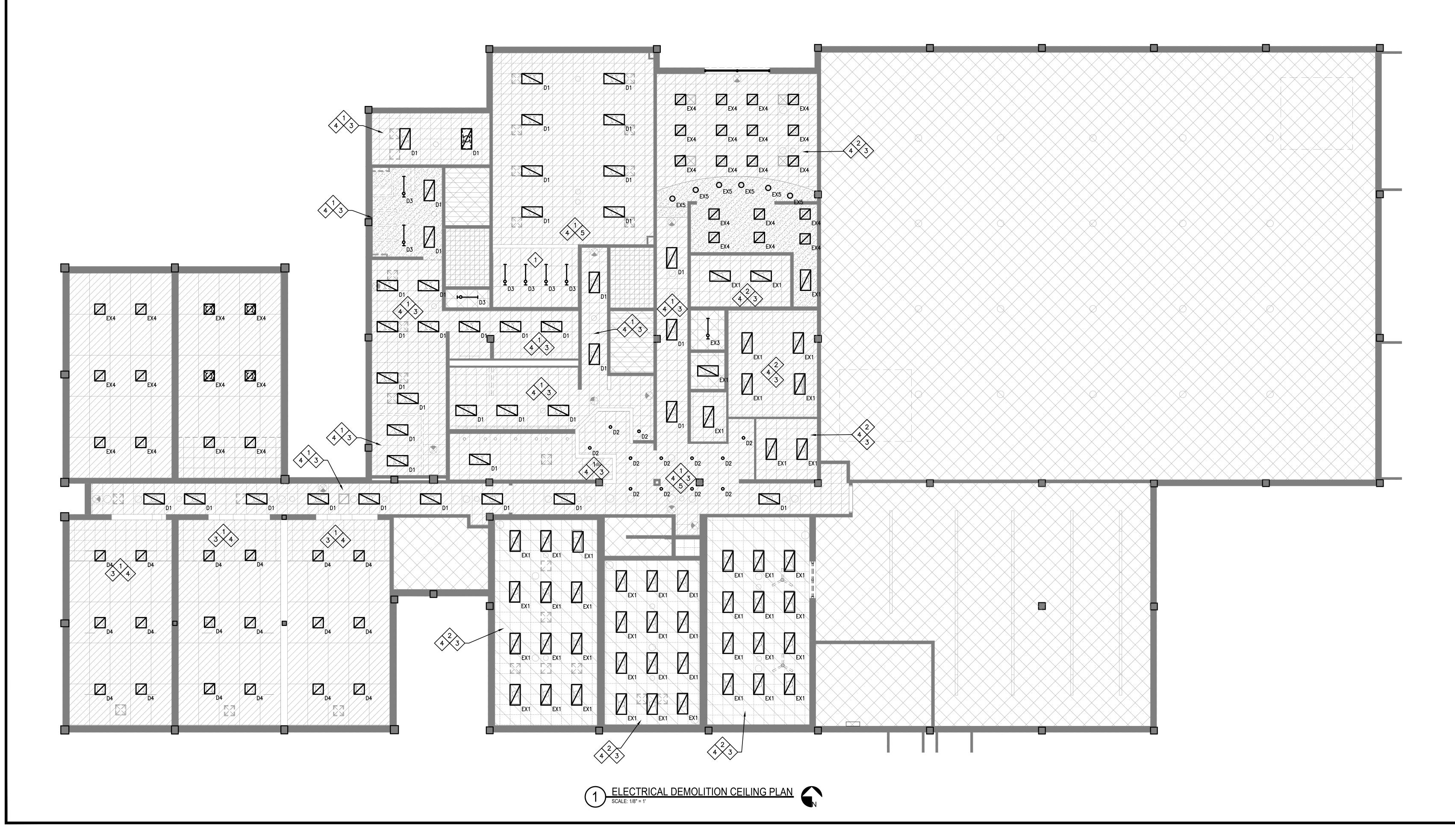




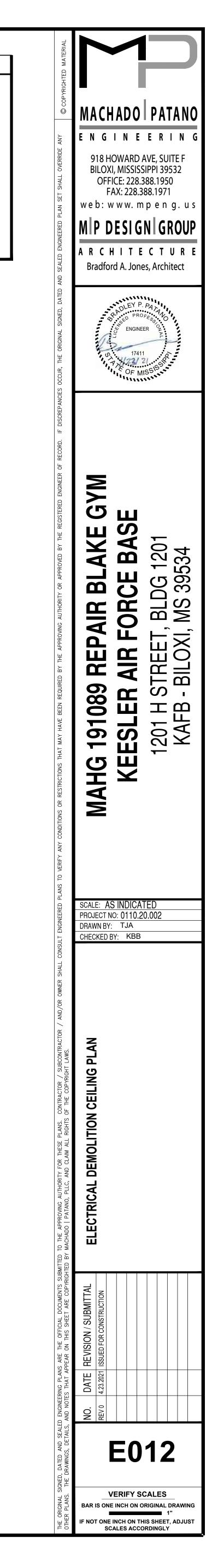


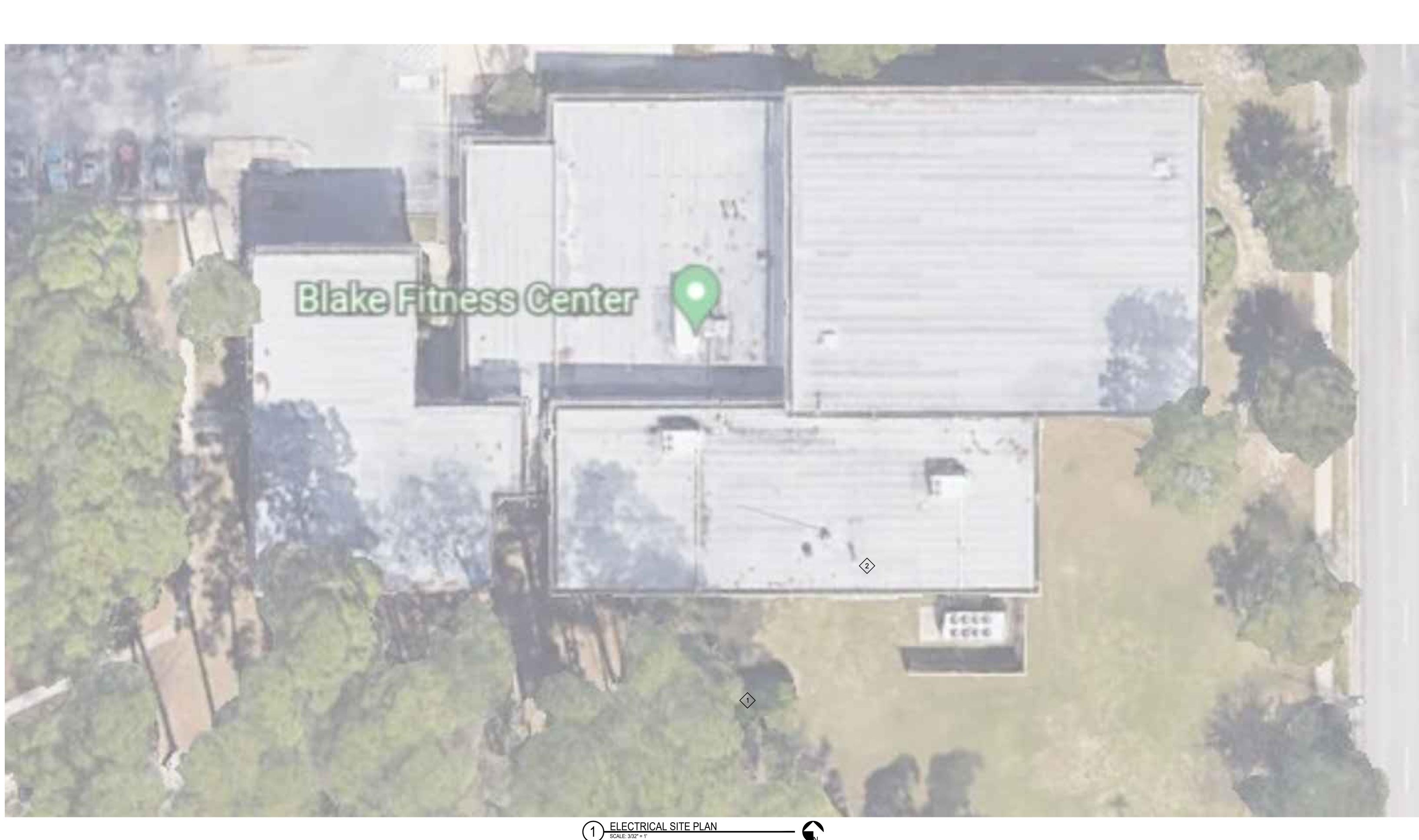
DRAWING E011 SPECIFIC NOTES					
•					
	CONTRACTOR SHALL DEMOLISH EXISTING WOODEN CABLE CHASE SYSTEM AND REMOVE CABLE AND CONDUIT BACK TO SOURCE.				
2	CONTRACTOR SHALL REPLACE POWER AND DATA RECEPTACLES AND FACEPLATES. CONTRACTOR SHALL VERIFY COUNT PRIOR TO BIDDING.				
$\langle 3 \rangle$	CONTRACTOR SHALL REMOVE EXISTING WALL MOUNT DEVICES AND STORE WITH CARE FOR FUTURE INSTALLATION.				
4	CONTRACTOR SHALL DEMOLISH ALL EXISTING SURFACE MOUNT RECEPTACLES, CABLE, AND CONDUIT BACK TO SOURCE. UPDATE PANEL SCHEDULE WITH "SPARE" WHERE CIRCUITS ARE DEMOLISHED. CONTRACTOR SHALL VERIFY COUNT PRIOR TO BIDDING.				
5	CONTRACTOR SHALL DEMOLISH EQUIPMENT CONNECTION, REMOVE BRANCH CIRCUIT BACK TO SOURCE. LABEL BREAKER AS SPARE.				
6	DEMOLISH EXISTING LDP PANEL. DEMOLISH EXISTING SERVICE ENTRANCE FEEDER AND CONDUIT BACK TO SECONDARY SIDE OF TRANSFORMER. PRESERVE ALL BRANCH CIRCUIT CABLE AND CONDUIT FOR CONNECTION TO NEW PANEL.				





	DRAWING E012 SPECIFIC NOTES
$\langle 1 \rangle$	CONTRACTOR SHALL DEMOLISH LIGHT FIXTURES, REMOVE BRANCH CIRCUIT TO NEAREST JUNCTION BOX.
2	CONTRACTOR SHALL REMOVE LIGHT FIXTURE AND STORE FOR FUTURE INSTALLATION. PRESERVE BRANCH CIRCUIT FOR FUTURE USE.
3	CONTRACTOR SHALL REMOVE ALL FIRE ALARM DEVICES AND STORE FOR FUTURE. PRESERVE CABLE AND CONDUIT FOR FUTURE USE. CONTRACTOR SHALL VERIFY COUNTS PRIOR TO BIDDING.
$\langle 4 \rangle$	CONTRACTOR SHALL REMOVE ALL INTERCOM/SERCUITY DEVICES AND STORE FOR FUTURE. PRESERVE CABLE AND CONDUIT FOR FUTURE USE.
5	CONTRACTOR SHALL DEMOLISH EXISTING CAN LIGHTS. REMOVE BRANCH CIRCUIT BACK TO NEAREST JUNCTION BOX.



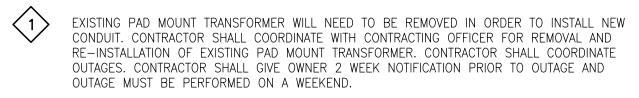


1 ELECTRICAL SITE PLAN SCALE: 3/32" = 1'

DRAWING E101 NOTES

- 1. ALL UNDERGROUND CONDUIT FITTINGS SHALL BE 36" LONG RADIUS.
- 2. ALL EXTERIOR CONDUIT ABOVE GRADE SHALL BE RIGID GALVANIZED STEEL.
- 3. SAW CUT THROUGH EXISTING ASPHALT AND CONCRETE AND RETURN SURFACE GRADE MATERIALS AND GROUND TO ORIGINAL CONDITION.
- 4. ALL CONDUIT SHALL BE AT LEAST 36" BELOW GRADE.

DRAWING E101 SPECIFIC NOTES



2 ELECTRICAL/ MECHANICAL ROOM.



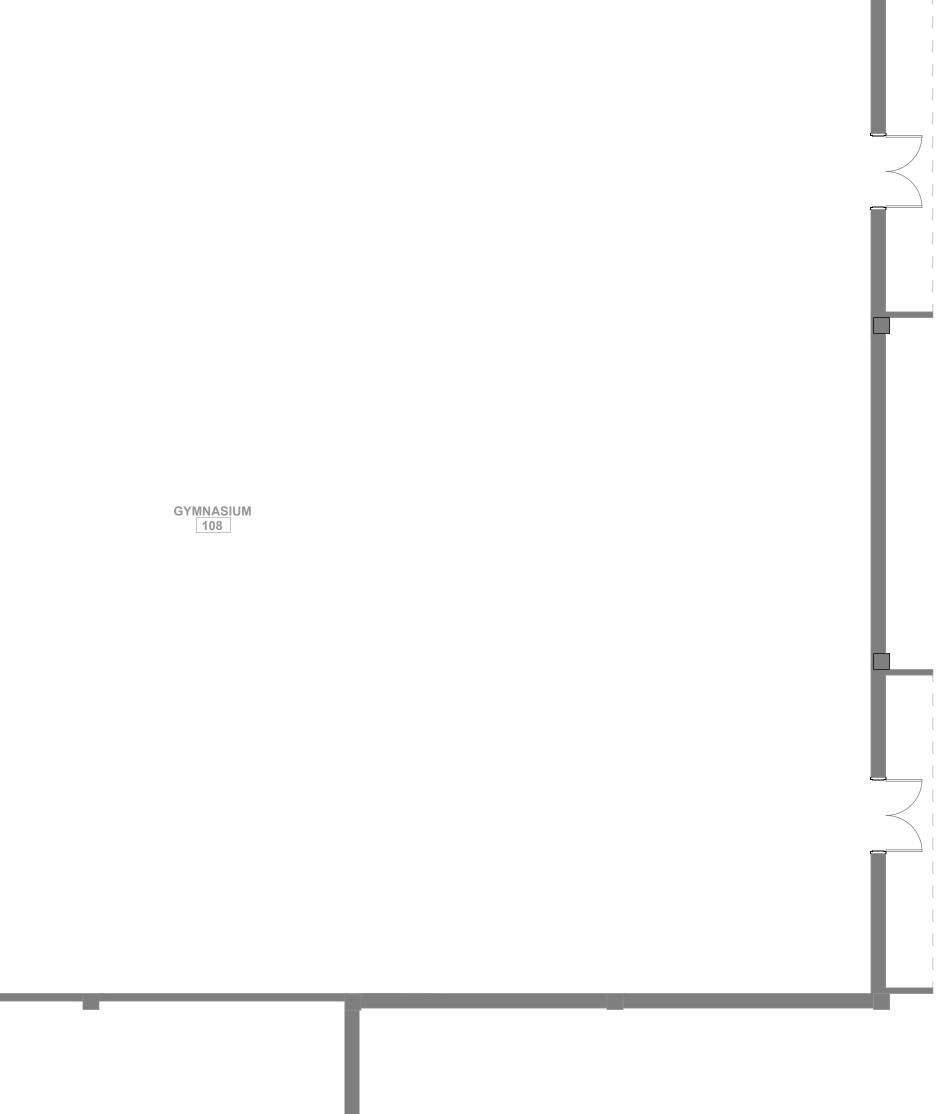


DRAWING E111 NOTES

- ALL RECEPTACLE CIRCUITS SHALL BE #12 AWG UNLESS OTHERWISE NOTED. IF MORE THAN 100'-0" TO THE FIRST CURRENT-CONSUMING DEVICE, THEN CONDUCTOR SHALL BE #10 AWG.
- 2. ALL RECEPTACLES SHALL BE MOUNTED 18" AFF UNLESS OTHERWISE NOTED.
- 3. ALL EXISTING RECEPTACLES SHALL BE REPLACED AND NEW FACEPLATES SHALL BE INSTALLED.

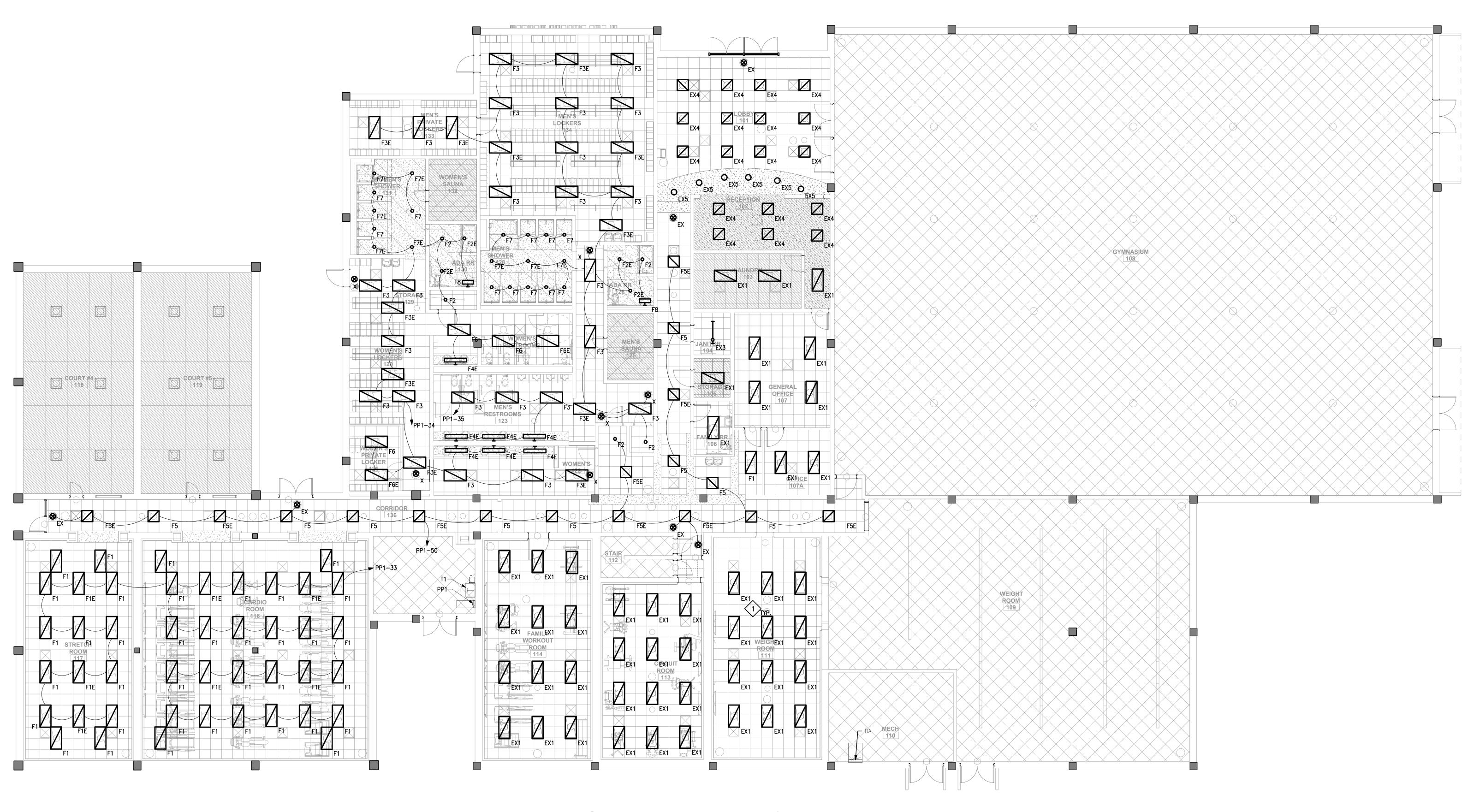
DRAWING E111 SPECIFIC NOTES

CONTRACTOR SHALL PROVIDE DS4000 SERIES RACEWAY. COORDINATE SIZE BASED FILL REQUIREMENTS FROM MANUFACTURER'S RECCOMENDATIONS.



WEIGHT ROOM 109





1) ELECTRICAL LIGHTING PLAN

DRAWING E121 NOTES

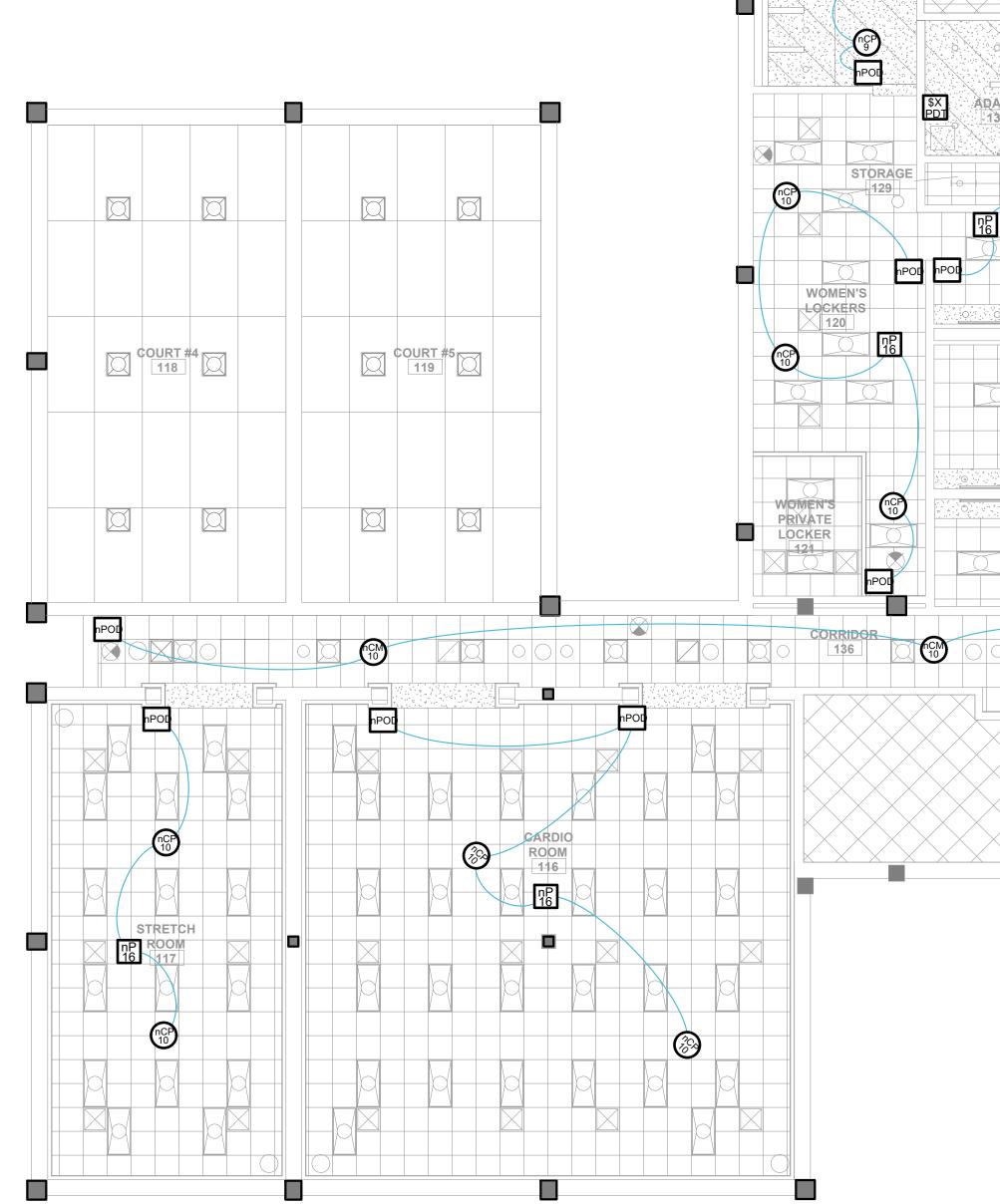
 ALL LIGHTING CIRCUITS SHALL BE #12 AWG UNLESS OTHERWISE NOTED. IF MORE THAN 100'-0" TO THE FIRST CURRENT-CONSUMING DEVICE, THEN CONDUCTOR SHALL BE #10 AWG.

- 2. REFERENCE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT MOUNTING LOCATIONS IN ARCHITECTURAL FINISHES.
- 3. REFERENCE ARCHITECTURAL PLANS FOR EXACT MOUNTING HEIGHTS OF LIGHT FIXTURES.
- 4. ALL LIGHT FIXTURES DESIGNATED EX REMOVED DURING DEMOLITION SHALL BE REINSTALLED MODIFY BRANCH CIRCUITS AS REQUIRED FOR REINSTALLATION.
- 5. CONTRACTOR SHALL CLEAN ALL LIGHT FIXTURES AND CHECK FOR PROPER OPERATION PRIOR TO REINSTALLATION.

DRAWING E121 SPECIFIC NOTES

CONTRACTOR SHALL REINSTALL EXISTING LIGHTS (EX) UTILIZING EXISTING BRANCH CIRCUITS. MODIFY BRANCH CIRCUITS AS REQUIRED.





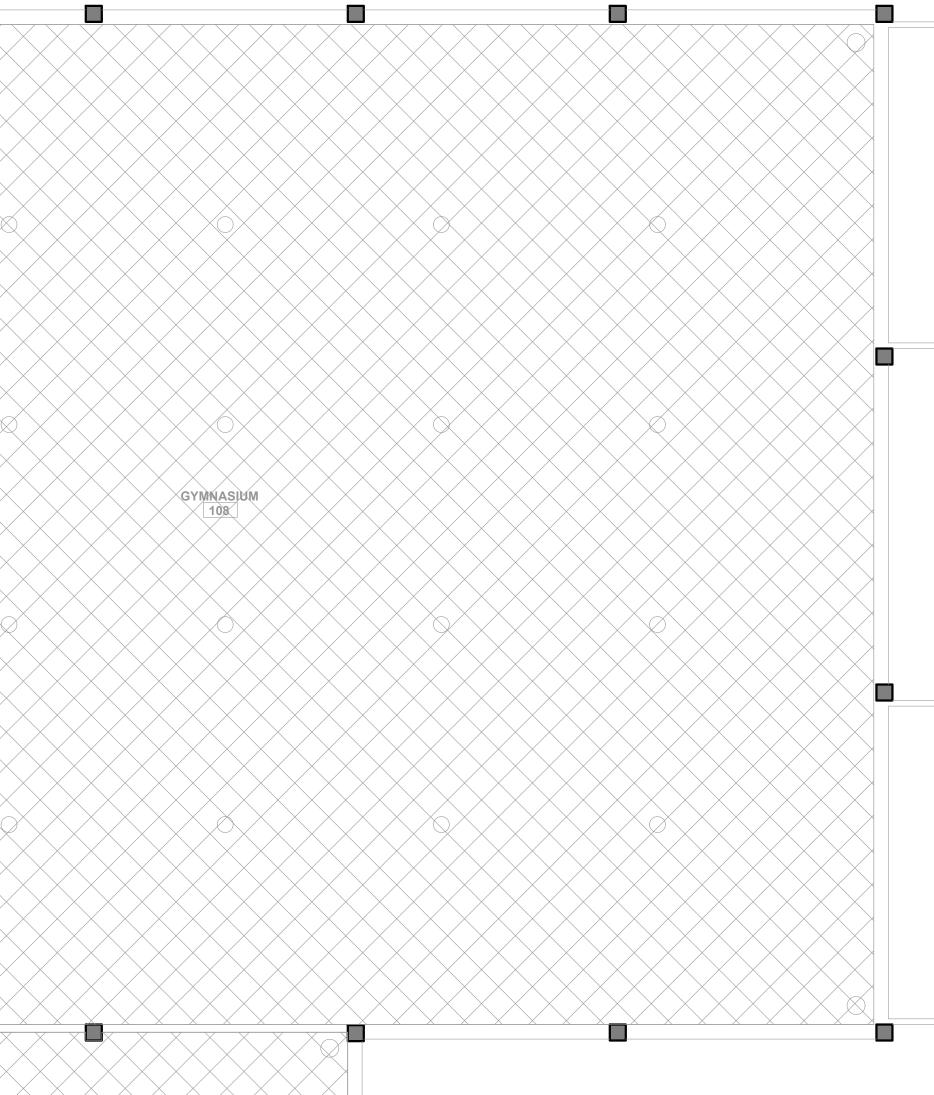
1 ELECTRICAL LIGHTING CONTROLS PLAN

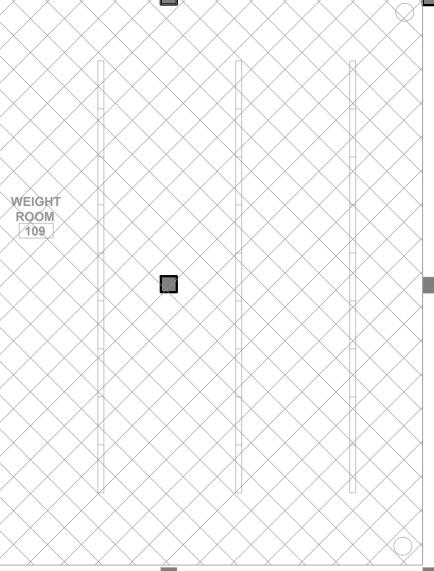


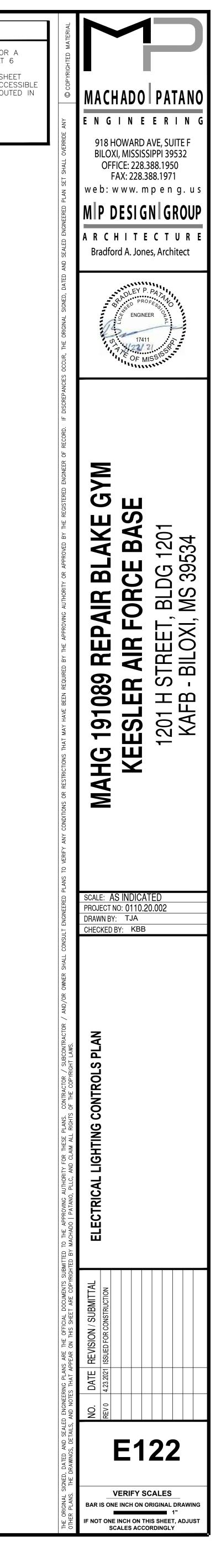
MEN'S PRIVATE LOCKERS 138		
WOMEN CO SHOWE		
STORAGE		
WOMEN'S Izi LOCKERS Izi 120 Izi		
	STORAGE GENERAL 0FFICE	
WOWEN'S PRIVATE LOCKER 121		
121 Image: Construction of the second seco		
STAIR 112 STAIR 112 STAIR 112 STAIR 112 STAIR		
	CIRCUIT ROOM	
		MECH

DRAWING E122 NOTES

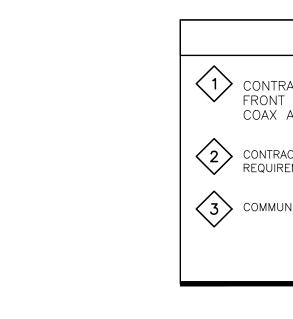
1. CONTRACTOR SHALL INCLUDE ALL EQUIPMENT AND CABLING NECESSARY FOR A COMPLETE AND OPERABLE SYSTEM. CONTRACTOR SHALL INCLUDE ALL CAT 6 CABLING TO INTERLINK EACH PIECE OF LIGHTING CONTROL EQUIPMENT. CONTRACTOR SHALL REFERENCE LIGHTING CONTROL RISER DIAGRAMS ON SHEET E631 AND E632. CAT 6 CABLE MAY BE ROUTED ON J-HOOKS ABOVE ACCESSIBLE CEILINGS. ABOVE NON-ACCESSIBLE CEILINGS, CAT 6 CABLE SHALL BE ROUTED IN CONDUIT.











DRAWING E141 SPECIFIC NOTES

CONTRACTOR SHALL ROUTE CAT 6 CABLES AND COAX IN FLOOR WIRE MOLD IN FRONT OF MACHINES. EACH PIECE OF EQUIPMENT REQUIRES A HOMERUNNED COAX AND CAT 6 CABLE.

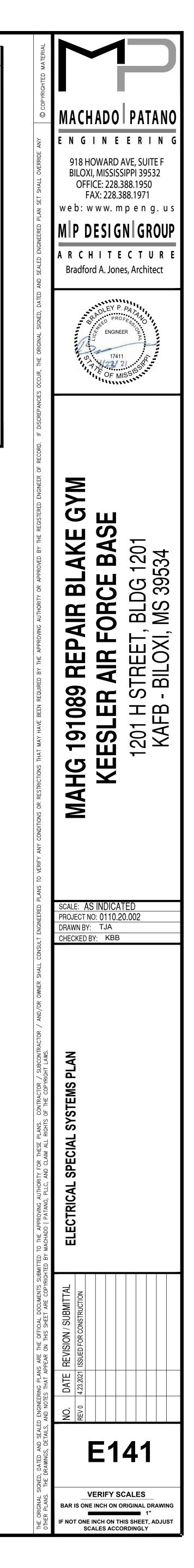
CONTRACTOR SHALL PROVIDE DS4000 SERIES RACEWAY. COORDINATE SIZE BASED FILL REQUIREMENTS FROM MANUFACTURER'S RECOMMENDATIONS.

3 COMMUNICATION RACK LOCATION.

DRAWING E141 NOTES

- 1. CONTRACTOR SHALL INSTALL 3/4" CONDUIT WITH 2 CAT 6 CABLES FROM DATA OUTLET BACK TO THE COMMUNICATION RACK. COORDINATE WITH OWNER FOR EXACT LOCATION AND TERMINATION.
- 2. SEE DRAWING E002 FOR GENERAL FIRE ALARM NOTES.
- 3. INSTALL PULL STRINGS IN ALL EMPTY CONDUITS.
- 4. ALL EXISTING DATA OUTLETS SHALL BE REPLACED AND NEW FACEPLATES SHALL BE INSTALLED.
- 5. ALL EXISTING FIRE ALARM DEVICES REMOVED DURING DEMOLITION SHALL BE REINSTALLED IN NEW CEILING.
- 6. ALL EXISTING INTERCOM/SECURITY DEVICES REMOVED DURING DEMOLITION SHALL BE REINSTALLED IN NEW CEILING.
- 7. ALL CABLING SHALL BE TIA/EIA CATEGORY 6 RATED.
- 8. CABLE COLOR CODING SHALL BE AS FOLLOWS: 8.1. ALARMS/CAMERAS – YELLOW
- 8.2. PUBLIC ADDRESS (PA) SYSTEMS GRAY
- 8.3. SECURE COMM (ENCRYPTED) RED 8.4. DATA/VOICE – BLUE
- 9. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING 2 POST DATA RACK IN STORAGE ROOM 105, ROUTING ALL CAT 6 CABLING BACK TO STORAGE ROOM 105, AND TERMINATIONS AT OUTLETS. OWNER IS RESPONSIBLE FOR FINAL TERMINATIONS AT SWITCH. NETWORK SWITCH (CISCO 9300–24U–A) AND BACKUP POWER SUPPLY (EATON 3000 SERIES UPS) IS PROVIDED AND INSTALLED BY OWNER.
- 10. ALL WIRING, TERMINATIONS, RACKS AND LABELING SHALL BE IN ACCORDANCE WITH 81ST COMMUNICATIONS SQUADRON PREMISE WIRING GUIDANCE.
- 11. ALL DATA AND COAX RUNS SHALL BE HOMERUNS BACK TO STORAGE ROOM 105 FROM RECEPTACLES.
- 12. CONTRACTOR SHALL PROVIDE DEDICATED COAX CABLE FROM EACH TV BACK TO STORAGE ROOM 105.

13. CONTRACTOR SHALL REINSTALL ALL EXISTING WALL MOUNTED DEVICES (FIRE ALARM, SECURITY, ETC.) REMOVED DURING DEMOLITION.



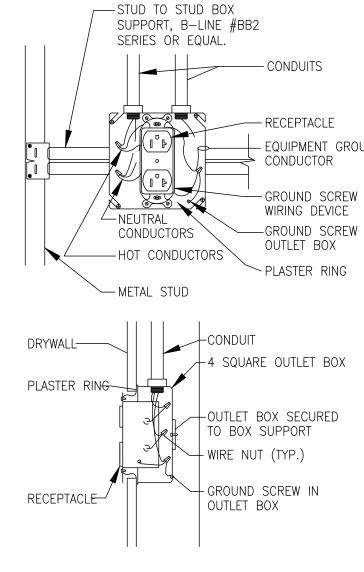


1 MECHANICAL POWER PLAN SCALE: 1/8" = 1'

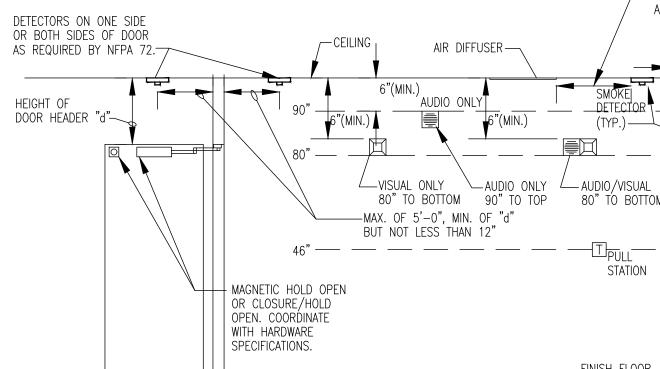
DRAWING E151 NOTES

- 1. ALL SAFETY SWITCHES SHALL BE PROVIDED AND MOUNTED BY THE E.C. COORDINATE EXACT REQUIREMENTS WITH THE EQUIPMENT MANUFACTURER.
- 2. COORDINATE EXACT WIRING REQUIREMENTS WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGHING IN.

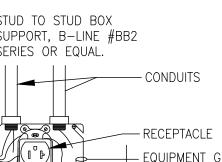




1 RECEPTACLE MOUNTING SCALE: 1/4" = 1'







EQUIPMENT GROUND CONDUCTOR GROUND SCREW ON CONDUCTORS GROUND SCREW IN

PLASTER RING

4 SQUARE OUTLET BOX

TO BOX SUPPORT WIRE NUT (TYP.) GROUND SCREW IN

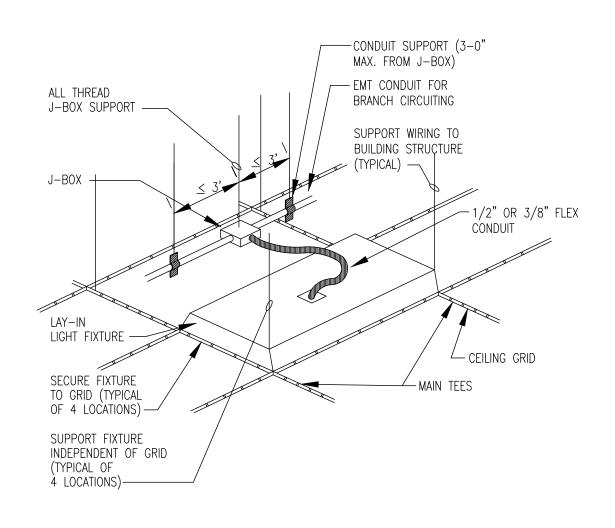
MAINTAIN 36" BETWEEN SMOKE DETECTOR AND AIR DIFFUSER/REGISTER/GRILL DO NOT PLACE DETECTOR IN THIS AREA TOP OF DETECTOR (TYP.) — ACCEPTABLE HERE FIRE ALARM DEVICE MOUNTING CRITERIA VISUAL ONLY AUDIO ONLY AUDIO/VISUAL 80" TO BOTTOM 90" TO TOP 80" TO BOTTOM <u>VISUAL UNIT</u> BOTTOM OF DEVICE 80 INCHES ABOVE HIGHEST FLOOR LEVEL OR 6 INCHES BELOW CEILING WHICH EVER IS LOWER. <u>AUDIO UNIT</u> TOP OF DEVICE 90 INCHES ABOVE STATION HIGHEST FLOOR LEVEL OR 6 INCHES BELOW CEILING WHICH EVER IS LOWER. <u>AUDIO/VISUAL_UNIT</u> REFER TO THE VISUAL UNIT. <u>PULL STATION</u> FINISH FLOOR 46" AFF TO CENTERLINE, TOP OF DEVICE SHALL NOT BE MORE THAN 48" AFF <u>GENERAL NOTE</u> THESE GUIDELINES SHALL BE USED UNLESS MOUNTING HEIGHTS HAVE BEEN.

SPECIFIED OTHERWISE ON THE DRAWINGS.

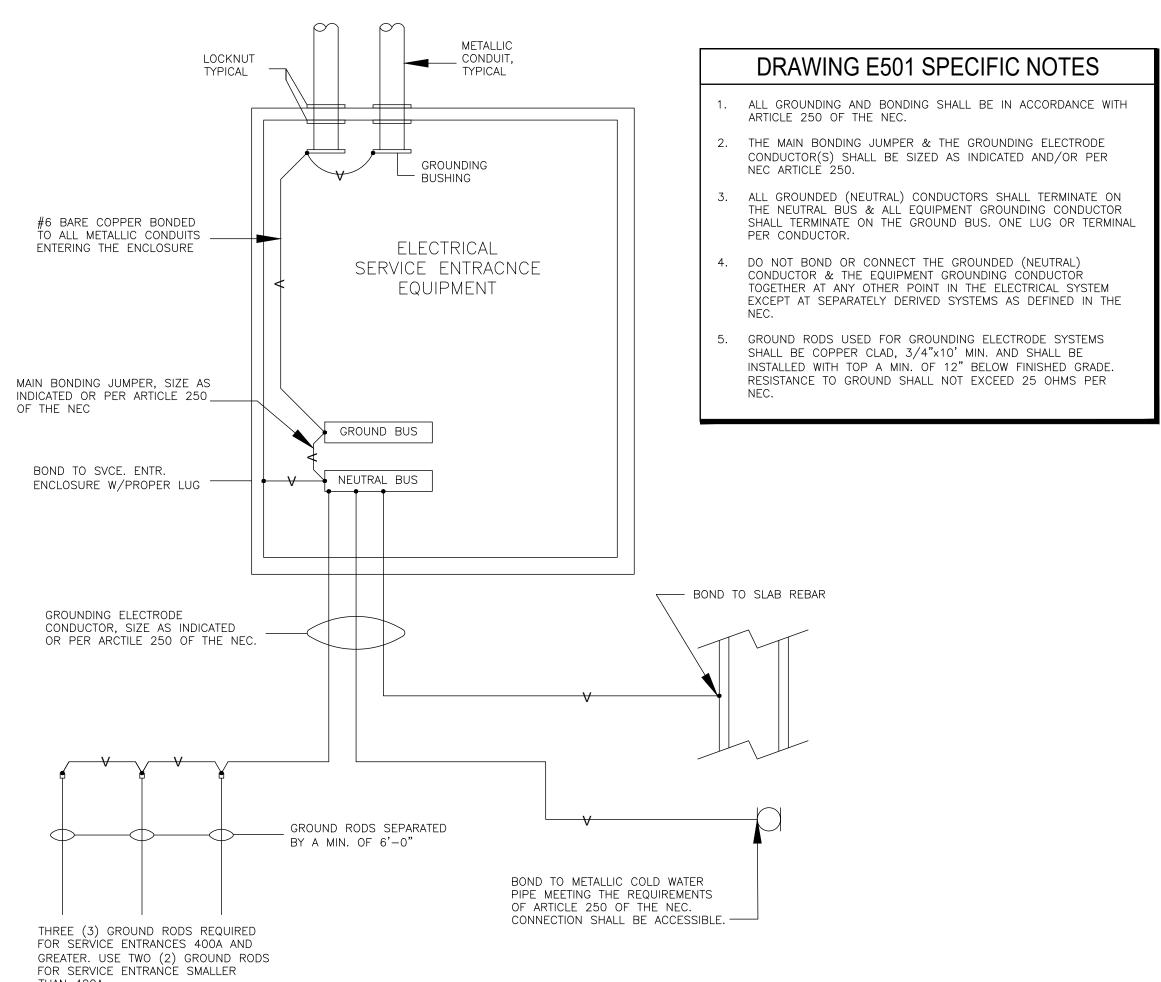
BOND TO SVCE. ENTR.

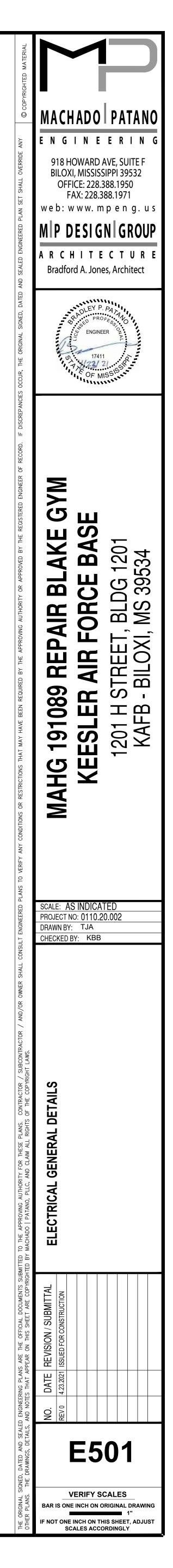
THAN 400A.

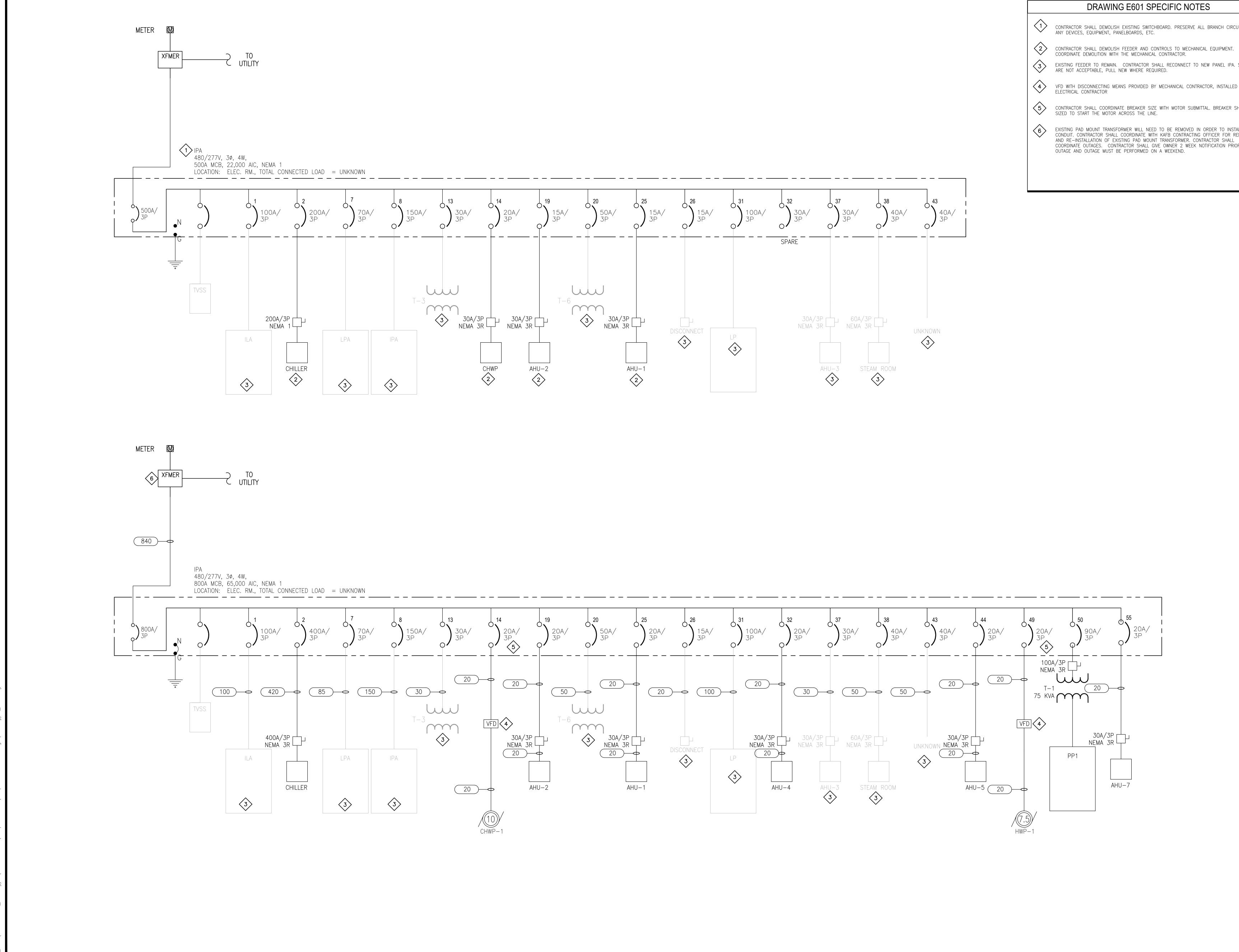
4 GROUNDING AND BONDING DETAIL SCALE: 1/4" = 1'



2 LAY IN FIXTURE MOUNTING SCALE: 1/4" = 1'







DRAWING E601 SPECIFIC NOTES

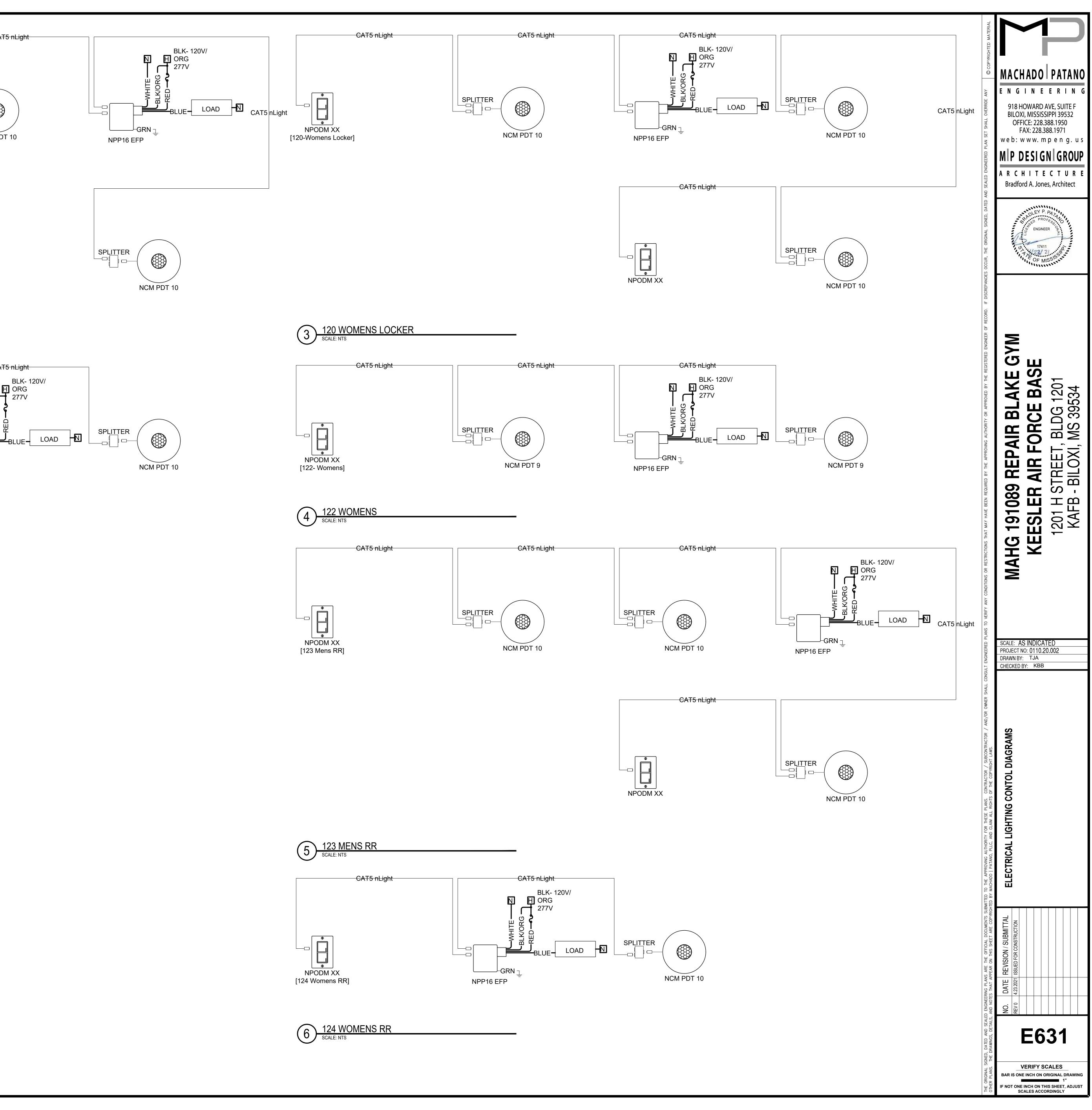
- CONTRACTOR SHALL DEMOLISH EXISTING SWITCHBOARD. PRESERVE ALL BRANCH CIRCUITS FOR ANY DEVICES, EQUIPMENT, PANELBOARDS, ETC.
- EXISTING FEEDER TO REMAIN. CONTRACTOR SHALL RECONNECT TO NEW PANEL IPA. SPLICES ARE NOT ACCEPTABLE, PULL NEW WHERE REQUIRED.
- VFD WITH DISCONNECTING MEANS PROVIDED BY MECHANICAL CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR
- 5 CONTRACTOR SHALL COORDINATE BREAKER SIZE WITH MOTOR SUBMITTAL. BREAKER SHALL BE SIZED TO START THE MOTOR ACROSS THE LINE.
- 6 EXISTING PAD MOUNT TRANSFORMER WILL NEED TO BE REMOVED IN ORDER TO INSTALL NEW CONDUIT. CONTRACTOR SHALL COORDINATE WITH KAFB CONTRACTING OFFICER FOR REMOVAL AND RE-INSTALLATION OF EXISTING PAD MOUNT TRANSFORMER. CONTRACTOR SHALL COORDINATE OUTAGES. CONTRACTOR SHALL GIVE OWNER 2 WEEK NOTIFICATION PRIOR TO OUTAGE AND OUTAGE MUST BE PERFORMED ON A WEEKEND.



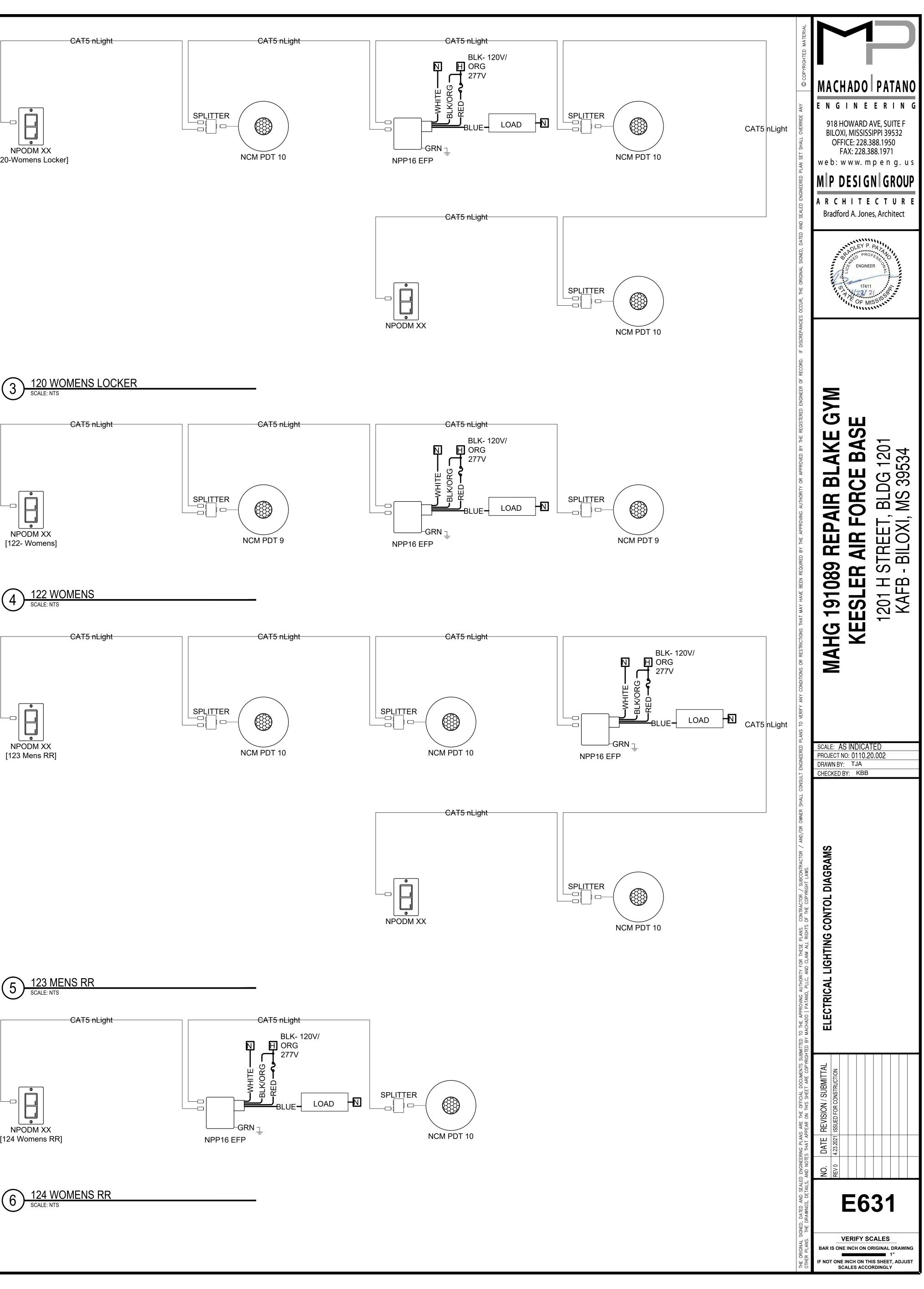
	NTING SU FROM T		BI	JS AMF	2081/12 PS 225 . 100%		4 W		AIC 22,000 Main BKR LUGS STAN	225			
KT #	CKT BKR	CIRCUIT DESCRIPTIO	N		OAD KV		СКТ #	CKT BKR				OAD KV	
#				Α	В	С					A	В	С
1	20/1	TV		0.36			2	20/1	RECEPTACLE		0.36		
3	20/1	TV			0.36		4	20/1	RECEPTACLE			0.72	
5	20/1	TV				0.18	6	20/1	WIREMOLD				0.1
7	20/1	WIREMOLD		0.18			8	20/1	WIREMOLD		0.18		
)	20/1	WIREMOLD			0.18		10	20/1	WIREMOLD			0.18	
1	20/1	WIREMOLD				0.18	12	20/1	WIREMOLD				0.1
3	20/1	WIREMOLD		0.18			14	20/1	WIREMOLD		0.18		
5	20/1	WIREMOLD	1		0.18		16	20/1	TV		1	0.36	
7	20/1	WIREMOLD	1			0.18	18	20/1	TV				0.3
9	20/1	WIREMOLD		0.18			20	20/1	TV		0.18		
1	20/1	WIREMOLD			0.18		22	20/1	WIREMOLD		1	0.18	
3	20/1	WIREMOLD				0.18	24	20/1	WIREMOLD				0.1
5	20/1	WIREMOLD		0.18			26	20/1	WIREMOLD		0.18		
7	20/1	TV		0.10	0.18		28	20/1	WIREMOLD		0.10	0.18	
9	20/1	RECEPTACLE			0.10	0.36	30	20/1	RECEPTACLE			0.10	0.3
1	20/1	RECEPTACLE		0.36		0.00	32	20/1	RECEPTACLE		0.36		0.0
3	20/1	LIGHTING		0.00	1.67		34	20/1	LIGHTING		0.00	0.637	
5	20/1	LIGHTING			1.07	0.926	36	20/1	VAV-1		1	0.037	0.
7	20/1	B-1		1.2		0.320	38	20/1	VAV-2		0.6		0.
9		B-2		1.2	1.2		40	,	VAV-3		0.0	0.6	
	20/1				1.2	0.6		20/1			4	0.0	
.1		VAV-4		0.0		0.6	42	20/1	VAV-5				0.
3	20/1	VAV-6		0.6	4		44	20/1	VAV-7		0.6	0.70	
5	20/1	EF-2			1.66	0.70	46	20/1	RECEPTACLE		4	0.36	0 -
7	20/1	TV				0.36	48	20/1	RECEPTACLE				0.3
9	20/1	RECEPTACLE		0.36			50	20/1	LIGHTING		0.306		
51	20/1	RECEPTACLE			0.36		52	20/1	RECEPTACLE			0.36	
3	20/1	RECEPTACLE				0.18	54	25/2	CU-1		4		0.72
5	20/1	RECEPTACLE		0.36			56				0.728		
7	20/1	SPARE			0		58	20/1	SPARE			0	
9	20/1	SPARE				0	60	20/1	SPARE				0
1	20/1	SPARE		0			62	20/1	SPARE		0		
3	20/1	SPARE			0		64	20/1	SPARE			0	
5	20/1	SPARE				0	66	20/1	SPARE				0
7	20/1	SPARE	Í	0			68	20/1	SPARE		0		
9	20/1	SPARE			0		70	20/1	SPARE			0	
1	20/1	SPARE	1			0	72	20/1	SPARE				0
3	20/1	SPARE		0			74	20/1	SPARE		0		
5	20/1	SPARE	1		0		76	20/1	SPARE			0	
7	20/1	SPARE				0	78	20/1	SPARE		1	1	0
9	20/1	SPARE		0			80	20/1	SPARE		0		
81	20/1	SPARE			0		82	20/1	SPARE		ĺ	0	
3	20/1	SPARE				0	84	20/1	SPARE				0
	1								TAL CONNECTED KV	A BY PHASE	7.63	9.54	6.6
		CONN KVA	CALC KVA			<u> </u>	I		CONN KVA	CALC KVA			
ICH1	ING	3.54	4.42	(12	5%)		MOTOR	S	9.71	9.71	 (100	%)	
	EST MOTOR		4.42 0.414	(12)				S TACLES	10.6	9.71	•	∕∞) S>10)	

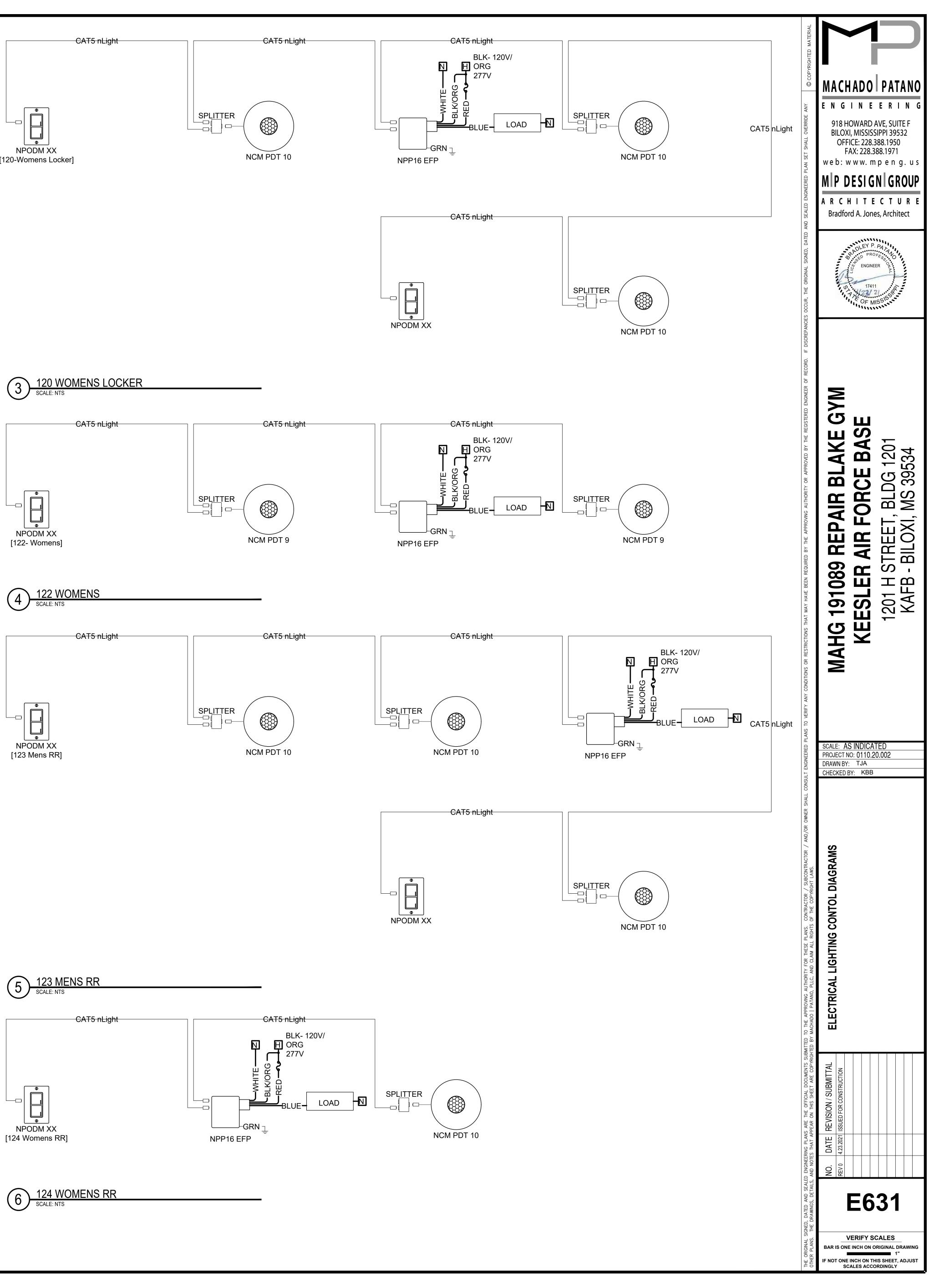


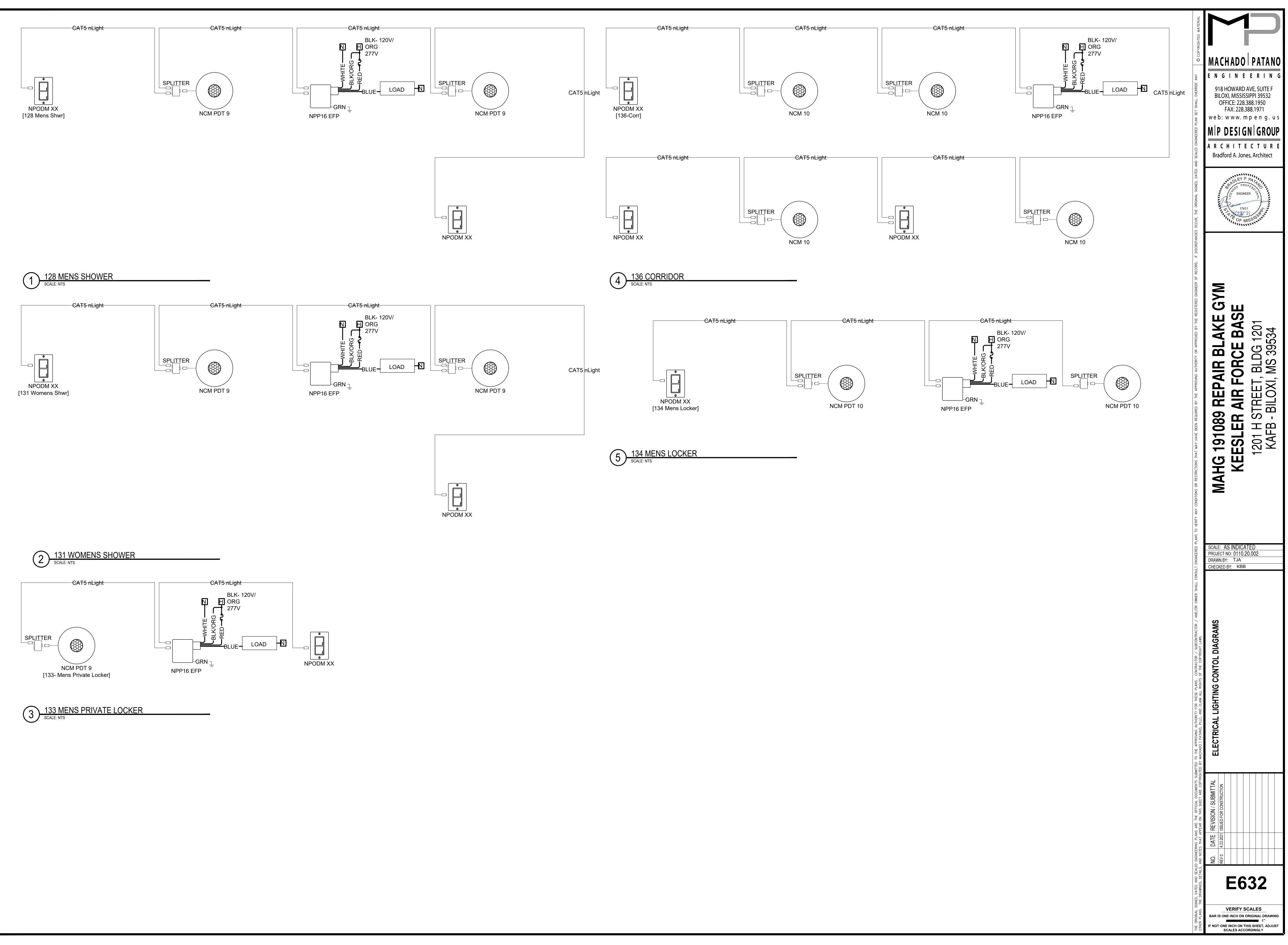
CAT5 nLight	CAT5 nLight	CAT5
NPODM XX [116-Cardio]	NPODM XX	SPLITTER NCM PDT
116 CARDIO SCALE: NTS		
CAT5 nLight	CAT5 nLight	CAT5
NPODM XX [117-Stretch Room]	SPLITTER NCM PDT 10	H H H H H H H H H H H H H H H H H H H
2 117 STRECH ROOM SCALE: NTS		



	122 WOMENS
4	SCALE: NTS







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