

REPLACEMENT OF HEATING AND COOLING SYSTEM  
BROOKHILL INDUSTRIES, INC.  
7989 STATE ROUTE 108  
OTTAWA, OH 45875

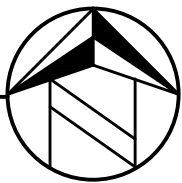
DRAWING INDEX

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LOCATION

OTTAWA, OH  
SITE LOCATION MAP  
NO SCALE



IT SHALL BE THE RESPONSIBILITY OF PRIME CONTRACTOR TO THOROUGHLY REVIEW THE ENTIRE SET OF DRAWINGS AND PROJECT MANUAL (OR SPECIFICATIONS) IN ORDER TO FAMILIARIZE THEMSELVES WITH ITEMS BEING PROVIDED BY AND WORK BEING PERFORMED BY ALL OTHER TRADES IN ADDITION TO ITEMS BEING PROVIDED BY AND WORK BEING PERFORMED BY HIS/HER RESPECTIVE TRADE.  
ALL CONTRACTORS SHALL COORDINATE WORK BETWEEN TRADES.

PROJECT SCOPE OF WORK

BASE BID:

THE EXISTING FLOOR PLAN, STRUCTURE, OCCUPANCY AND PLUMBING SYSTEMS WILL NOT BE ALTERED IN THIS PROJECT.

THE EXISTING MECHANICAL EQUIPMENT PROVIDING HEATING, VENTILATION, AND AIR CONDITIONING TO THE OFFICE AREA AND WORKSHOP ARE BEING REMOVED AND REPLACED WITH A NEW PACKAGED UNIT OF EQUIVALENT CAPACITY. THERE ARE TWO EXISTING SYSTEMS. THE FIRST CONSIST OF ONE 20 TON AIR COOLED CONDENSER AND ONE INDOOR AIR HANDLING UNIT. THE SECOND CONSIST OF ONE 6 TON AIR COOLED CONDENSER AND ONE INDOOR AIR HANDLING UNIT. THE PROPOSED SYSTEMS WILL CONSIST OF ONE 20 TON PACKAGED AIR CONDITIONING UNIT, AND ONE 6 TON PACKAGED AIR CONDITIONING UNIT. THE NEW UNITS WILL CONNECT TO EXISTING SUPPLY AND RETURN DUCTWORK. THE OUTSIDE AIR INTAKE WILL BE BROUGHT INTO NEW UNITS DIRECTLY. EXISTING CONTROLS WILL BE ALTERED AS NECESSARY FOR EQUIPMENT BEING REMOVED AND NEW EQUIPMENT BEING ADDED.

THE ELECTRICAL SYSTEM WILL BE ALTERED AS REQUIRED TO ACCOMMODATE NEW AIR CONDITIONING EQUIPMENT AND WILL NOT BE ALTERED IN REGARDS TO OTHER ELECTRICAL SYSTEMS.

AS NECESSARY, CONTRACTOR SHALL PROVIDE TEMPORARY HEAT FOR WORK AREA 122. ANY PORTABLE SPACE HEATERS SHALL BE PROTECTED WITH A PORTABLE FENCE ENCLOSURE. IF TEMPORARY HEATING UNITS REQUIRE A FUEL SOURCE OTHER THAN ELECTRICAL SERVICE, THE CONTRACTOR SHALL PAY FOR ALL FUEL.

SEE MECHANICAL AND ELECTRICAL DRAWINGS IN THIS SET FOR FURTHER INFORMATION.

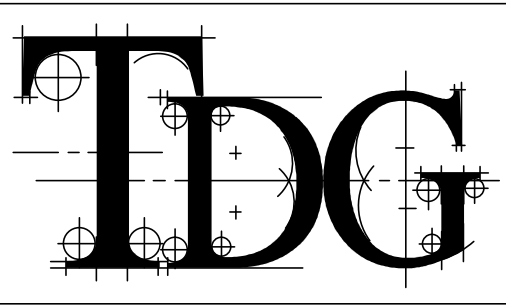
ALTERNATE M-1:

THE EXECUTIVE CONTROLLER FOR THE EXISTING NOVAR CONTROL SYSTEM SHALL BE UPGRADED TO A NEW BUILDING CONTROLLER UTILIZING AN OPEN PROTOCOL NIAGARA N4 SUPERVISORY SOFTWARE FOR A GRAPHICAL USER INTERFACE. CONTRACTOR SHALL ENSURE THAT ALL EXISTING EQUIPMENT CONTROLLED BY REMOVED EXISTING SYSTEM SHALL REMAIN CONTROLLED BY NEW SYSTEM, AND SHALL UPGRADE CONTROLLERS, WIRING, AND OTHER COMPONENTS AS NECESSARY TO INTERFACE WITH NEW OPEN PROTOCOL FRONT END. CONTRACTOR CAN REUTILIZE EXISTING CONTROLLERS, WIRING, AND OTHER COMPONENTS WHERE POSSIBLE. THE SYSTEM UPGRADE SHALL ALLOW FOR IMPLEMENTATION OF ENHANCED CONTROL STRATEGIES, USER INTERFACE GRAPHICS, AND SCHEDULING FEATURES.

THE EXISTING CONTROLS OF THE VAV BOXES, BOILER, PUMPS, RELIEF FANS, ETC. SHALL BE MODIFIED AND/OR REPLACED AS NECESSARY FOR NEW OPEN PROTOCOL FRONT END SYSTEM.

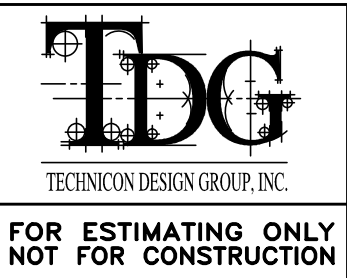
2017 OBC CODE COMPLIANCE DATA		
OWNER	NAME	BROOKHILL INDUSTRIES, INC.
	ADDRESS	124 PUTNAM PARKWAY
		OTTAWA, OHIO 45875
	PHONE	419-876-3932
	FAX	419-876-3931
SUBMITTER	EMAIL	BROOKHILL@TDS.NET
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		SUITE 102
		OTTAWA, OHIO 45875
	PHONE	419-523-5323
	FAX	419-523-9441
EMAIL	info@technicondesigngroup.com	
DESIGNER TYPE	OHIO REGISTRATION NUMBER	OHIO REGISTRATION NO. 69299
	o ARCHITECT      • ENGINEER      o CERTIFIED DESIGNER	
DESIGN CRITERIA	TYPE OF CONSTRUCTION	2A
	CURRENT USE GROUP	B,F-1
	PROPOSED USE GROUP	B,F-1
	BUILDING HEIGHT	18'-8"
	NUMBER OF STORIES	1
	OCCUPANT LOAD	163
	STORAGE HEIGHT	N/A
	STORAGE AISLE WIDTH	N/A
	MIXED USE GROUP	N/A
	SEPARATED	N/A
BUILDING AREA	NON-SEPARATED	N/A
	EXISTING BUILDING AREA	19,579
	ADDITION BUILDING AREA	0
	TOTAL BUILDING AREA	19,579
	AREA OF ALTERATION	0
	TABULAR AREA	N/A
	OPEN AREA INCREASE	N/A
	FIRE SUPPRESSION INCREASE	N/A
	TOTAL ALLOWABLE AREA	N/A
SPECIAL INSPECTIONS		NOT REQUIRED

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SCOTT BIRKEMEIER, PROJECT ENGINEER

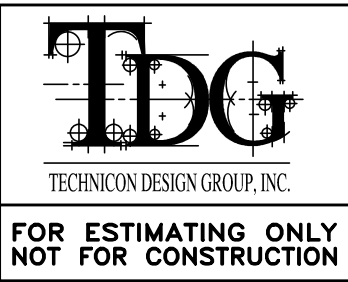


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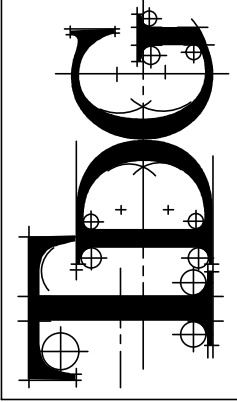
ISSUED DATE	
08-30-2018	OWNER REVIEW
09-20-2018	BIDDING/PERMIT







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HVAC REPLACEMENT  
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MECHANICAL  
FLOOR PLAN

ISSUED DATE

08-30-2018 OWNER REVIEW  
09-20-2018 BIDDING/PERMIT

DRAWN BY: SAB

CHECKED BY: SAB

DATE: 06-18

PLOT SCALE: AS NOTED

JOB NO. 36-2416-18

SHEET

M-1

OF 4 SHEETS

### M.C. GENERAL NOTES:

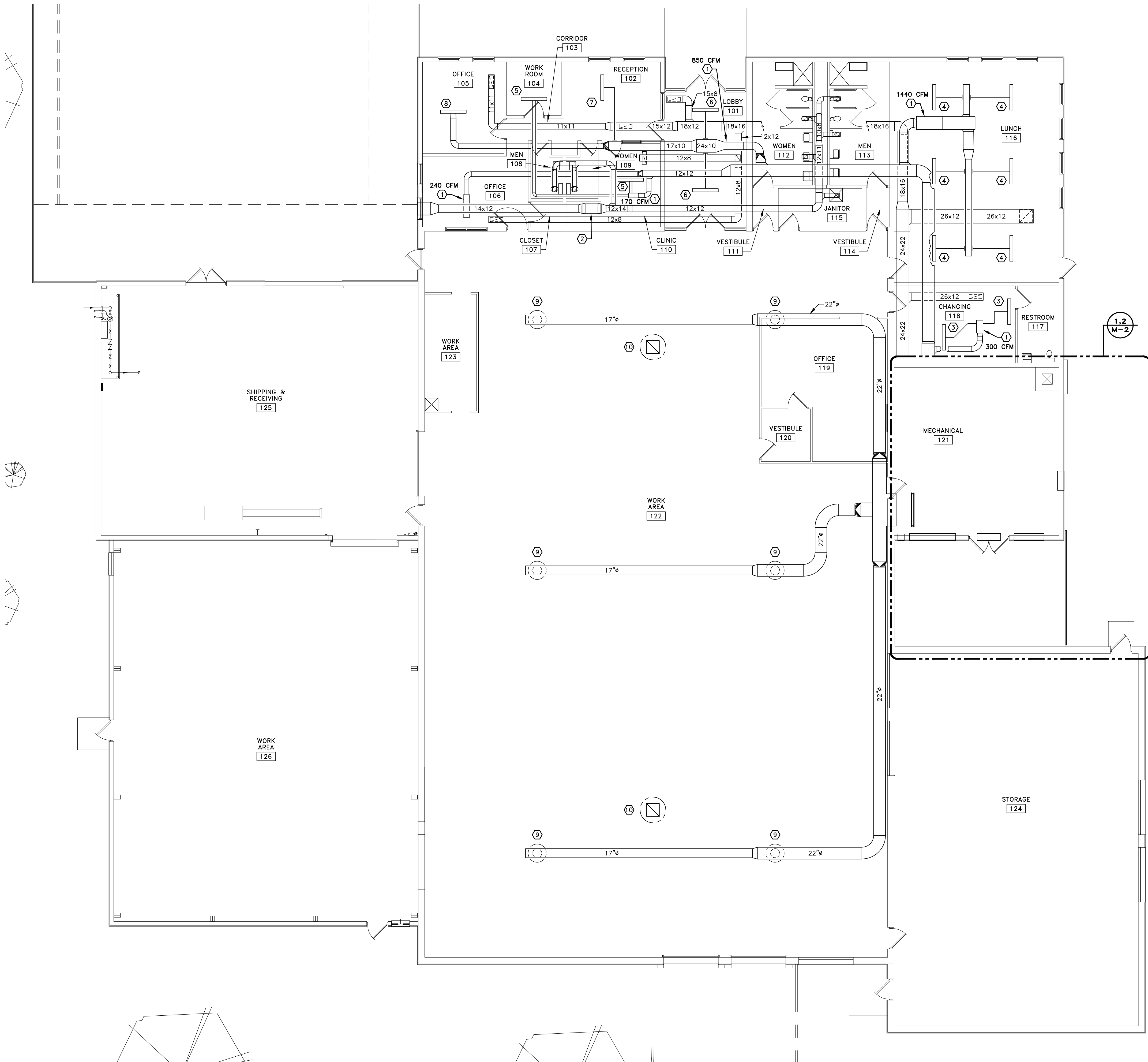
1. COMPLY WITH ALL FEDERAL, STATE, AND LOCAL CODES, ORDINANCES, RULES AND REGULATIONS.
2. ALL MECHANICAL WORK SHALL BE COORDINATED WITH GENERAL CONTRACTOR AND ELECTRICAL CONTRACTOR PRIOR TO INSTALLATION.
3. FIELD VERIFY LOCATION OF EQUIPMENT AND DUCTWORK TO ENSURE NO INTERFERENCES WITH FIELD CONDITIONS.
4. OUTSIDE AIR INTAKES SHALL BE A MINIMUM OF 10'-0" FROM SANITARY VENTS, EXHAUST AIR OUTLETS, GAS REGULATORS, OR OTHER CONTAMINANT SOURCES.
5. DRAWINGS ARE SCHEMATIC IN NATURE AND MAY NOT SHOW ALL ELEVATION CHANGES AND HORIZONTAL OFFSETS. CONTRACTOR SHALL FIELD ADJUST AS REQUIRED AND SHALL MINIMIZE OFFSETS WHERE POSSIBLE.
6. ANY EQUIPMENT THAT IS SUBSTITUTED SHALL FIT IN THE PROVIDED SPACE WITH ADEQUATE ROOM FOR SERVICING, INCLUDING SUBSTITUTED EQUIPMENT LISTED IN SPECIFICATIONS.
7. ALL DUCTWORK AND PIPING SHALL BE SUPPORTED INDEPENDENTLY FROM EQUIPMENT.
8. FABRICATE ALL DUCTWORK IN ACCORDANCE WITH SPECIFICATIONS AND SMACNA STANDARDS.
9. DUCT SIZES LISTED ARE CLEAR INSIDE DIMENSION, UNLESS OTHERWISE NOTED.
10. DUCTWORK ROUTING SHALL BE COORDINATED WITH OTHER CONTRACTORS TO VERIFY NO CONFLICTS WITH LIGHT FIXTURES, PIPING, AND STRUCTURAL MEMBERS.
11. ALL DUCTWORK CONNECTED TO EQUIPMENT WITH MOVING PARTS SHALL BE CONNECTED WITH FLEXIBLE DUCT CONNECTORS.
12. PROVIDE TURNING VANES ON ALL RECTANGULAR NON-RADIUS SUPPLY ELBOWS.
13. ALL NEW DUCTWORK SHALL BE INSULATED PER SPECIFICATIONS.
14. INSTALL NEW FILTERS ON ALL HVAC EQUIPMENT AT COMPLETION OF ALL CONSTRUCTION WORK.
15. E.C. SHALL PROVIDE AND INSTALL CONDUIT AND LINE VOLTAGE POWER WIRING TO ALL EQUIPMENT. M.C. SHALL PROVIDE AND INSTALL CONDUIT AND CONTROL WIRING.
16. TEST AND BALANCE ALL HVAC SYSTEM IN ACCORDANCE WITH NEBB OR AABC STANDARDS. SEE SPECIFICATIONS FOR GUIDELINES. REPORT SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL.

### MECHANICAL LEGEND AND ABBREVIATIONS

MECHANICAL CONTRACTOR	M.C.
GENERAL CONTRACTOR	G.C.
ELECTRICAL CONTRACTOR	E.C.
PLUMBING CONTRACTOR	P.C.
PACKAGED ROOFTOP UNIT	RTU
FIELD VERIFY	F.V.
ABOVE FINISHED FLOOR	A.F.F.
BELOW FINISHED FLOOR	B.F.F.
BOTTOM OF GRILLE	B.O.G.
TOP OF GRILLE	T.O.G.
BOTTOM OF DUCT	B.O.D.
TOP OF DUCT	T.O.D.
BOTTOM OF LOUVER	B.O.L.
TOP OF LOUVER	T.O.L.
AUTHORITY HAVING JURISDICTION	A.H.J.
SUPPLY AIR	SA
RETURN AIR	RA
EXHAUST AIR	EA
OUTSIDE AIR	OA
BREAK IN PIPE	+
DIRECTION OF FLOW IN PIPE	→
PIPE DROP	○
PIPE RISE	○
TAKE-OFF TOP OF PIPE	○
TAKE-OFF BOTTOM OF PIPE	○
THERMOSTAT	⊙
AIR DEVICE TAG-AIRFLOW RATE, CFM	X-XXX
DUCT SIZE, CLEAR INSIDE, A = PLAN WIDTH, B = PLAN DEPTH	AxB
AIR VOLUME CONTROL DAMPER	⌈
ELBOW WITH TURNING VANES	⌈
SUPPLY DUCTWORK UP, DOWN	⊠
RETURN AND EXHAUST DUCTWORK UP, DOWN	⊠

### KEY NOTES

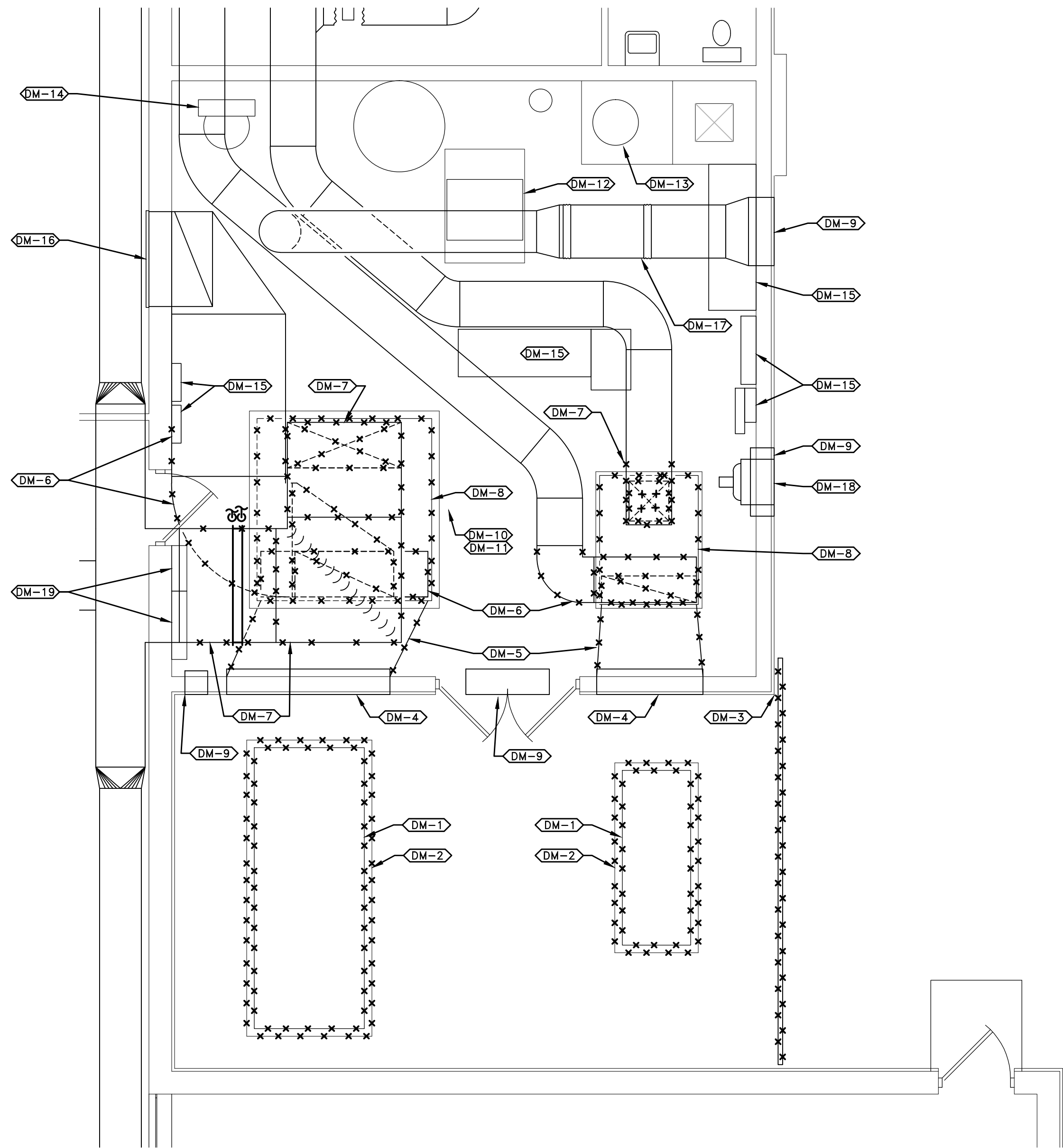
1. EXISTING VAV BOX TO REMAIN. CONTRACTOR TO F.V. VAV BOX IS IN WORKING ORDER AND SHALL BALANCE TO AIRFLOW INDICATED. UNDER BASE BID THE CONTROLS OF THE VAV BOX SHALL REMAIN UNCHANGED. UNDER ALTERNATE 1 THE CONTROLS OF THE VAV BOX SHALL BE MODIFIED AND/OR REPLACED AS NECESSARY FOR NEW OPEN PROTOCOL FRONT END SYSTEM.
2. EXISTING RESTROOM EXHAUST FAN TO REMAIN UNCHANGED.
3. EXISTING SUPPLY DIFFUSER TO BE BALANCED TO 150 CFM.
4. EXISTING SUPPLY DIFFUSER TO BE BALANCED TO 240 CFM.
5. EXISTING SUPPLY DIFFUSER TO BE BALANCED TO 85 CFM.
6. EXISTING SUPPLY DIFFUSER TO BE BALANCED TO 160 CFM.
7. EXISTING SUPPLY DIFFUSER TO BE BALANCED TO 270 CFM.
8. EXISTING SUPPLY DIFFUSER TO BE BALANCED TO 260 CFM.
9. EXISTING SUPPLY DIFFUSER TO BE BALANCED TO 1,100 CFM.
10. EXISTING RELIEF FAN TO REMAIN. BASE BID: THE CONTROLS SHALL REMAIN THE SAME. ALTERNATE M-1: THE CONTROLS OF THE VAV BOX SHALL BE MODIFIED AND/OR REPLACED AS NECESSARY FOR NEW OPEN PROTOCOL FRONT END SYSTEM.



FLOOR PLAN - MECHANICAL

SCALE: 1/8"=1'-0"

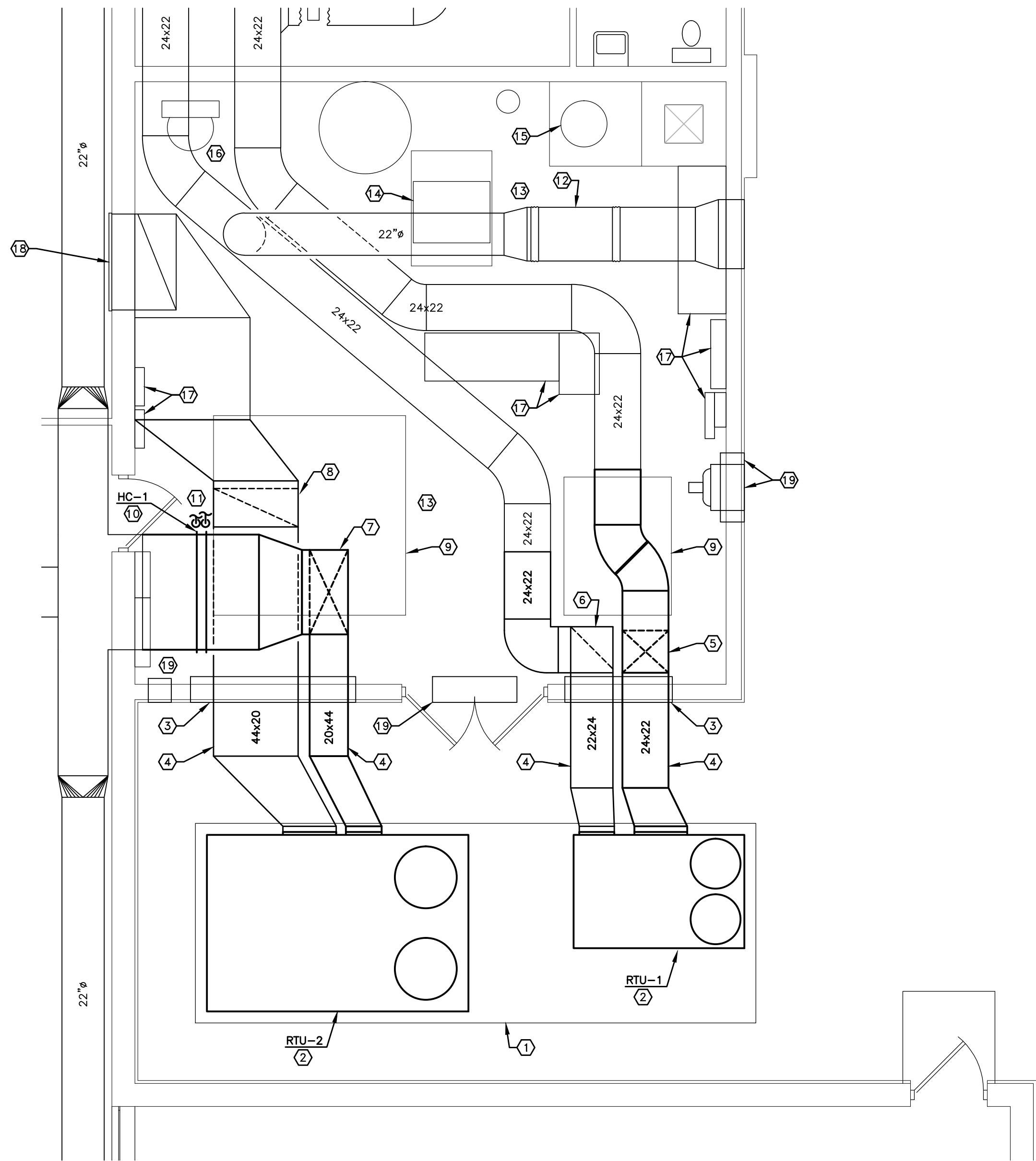




**1**  
**M-2** DEMOLITION PLAN  
SCALE: 1/4"=1'-0"

**MECHANICAL DEMOLITION PLAN NOTES**

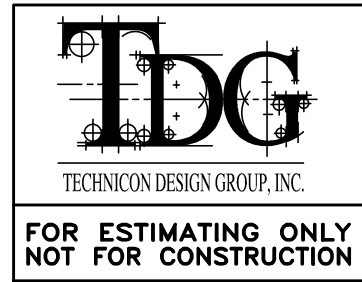
- EXISTING AIR COOLED CONDENSER TO BE REMOVED INCLUDING THE REMOVAL OF ANY AND ALL ASSOCIATED PIPING OR CONTROL WIRING. M.C. SHALL PUMP DOWN AND LEGALLY DISPOSE OF REFRIGERANT IN THE SYSTEM. E.C. TO REMOVE ANY ASSOCIATED POWER WIRING AS INDICATED ON ELECTRICAL DRAWINGS.
- EXISTING CONCRETE HOUSEKEEPING PAD TO BE REMOVED AND DISPOSED OF.
- EXISTING FENCE TRACK TO BE REMOVED AND DISPOSED OF.
- EXISTING OUTSIDE AIR INTAKE LOUVER TO BE REMOVED AND DISPOSED OF.
- EXISTING OUTSIDE AIR DUCT TO BE REMOVED.
- EXISTING RETURN AIR DUCT TO BE REMOVED AS SHOWN AND AS NECESSARY FOR REMOVAL OF UNIT AND RECONNECTION TO NEW PACKAGED UNITS UNITS.
- EXISTING SUPPLY AIR DUCT TO BE REMOVED AS SHOWN AND AS NECESSARY FOR REMOVAL OF UNIT AND RECONNECTION TO NEW PACKAGED UNITS UNITS.
- EXISTING AIR HANDLING UNIT TO BE REMOVED INCLUDING THE REMOVAL OF ANY AND ALL ASSOCIATED PIPING OR CONTROL WIRING. E.C. TO REMOVE ANY ASSOCIATED POWER WIRING AS INDICATED ON ELECTRICAL DRAWINGS.
- EXISTING LOUVER TO REMAIN.
- EXISTING HEATING WATER PIPING SHALL BE DISCONNECTED FROM COIL AND SHALL BE REMOVED AS NECESSARY FOR REMOVAL OF EXISTING AHU AND INSTALLATION OF NEW HEATING WATER COIL. PIPING SHALL BE RECONNECTED TO NEW HEATING COIL. SEE ENLARGED PLAN '2' ON SHEET M-2.
- EXISTING HEATING WATER PUMP TO REMAIN.
- EXISTING BOILERS TO REMAIN.
- EXISTING DOMESTIC WATER HEATER TO REMAIN.
- EXISTING AIR COMPRESSOR TO REMAIN.
- EXISTING ELECTRICAL EQUIPMENT. SEE ELECTRICAL DRAWINGS.
- EXISTING RETURN GRILLES TO REMAIN UNCHANGED.
- EXISTING RELIEF FAN TO REMAIN. **BASE BID:** THE CONTROLS SHALL REMAIN THE SAME. **ALTERNATE M-1:** THE CONTROLS OF THE VAV BOX SHALL BE MODIFIED AND/OR REPLACED AS NECESSARY FOR NEW OPEN PROTOCOL FRONT END SYSTEM.
- EXISTING BOILER ROOM VENTILATION FAN TO REMAIN.
- EXISTING CONTROL SYSTEM. **BASE BID:** THE CONTROLS ARE TO BE MODIFIED AS NECESSARY TO ACCOMMODATE EQUIPMENT INDICATE TO BE REMOVED OR MODIFIED, AND TO CONTROL NEW PACKAGED UNITS BEING ADDED TO THE SYSTEM. **ALTERNATE M-1:** FRONT END OF CONTROL SYSTEM SHALL BE REPLACED WITH BAGNET OPEN PROTOCOL SYSTEM. MODIFY AND/OR REPLACE OTHER CONTROLS COMPONENTS THROUGHOUT SYSTEM AS NECESSARY TO ENSURE SYSTEM FUNCTIONALITY AND DESIRED OPERATION.



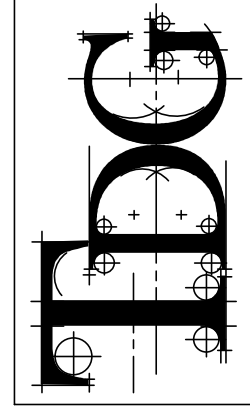
**2**  
**M-2** ENLARGED PLAN  
SCALE: 1/4"=1'-0"

**KEY NOTES**

- 8'-0" x 24'-6" x 4" THICK CONCRETE SLAB W/ #3 BARS @ 18" O.C. EACH WAY OVER 6" MIN. COMPACTED STONE BASE. CONTRACTOR SHALL VERIFY PAD DIMENSIONS AND ADJUST SIZE TO ACCOMMODATE PACKAGED EQUIPMENT SUPPLIED. PAD SHALL EXTEND 6" BEYOND EDGE OF EQUIPMENT IN ALL DIRECTIONS AND SHALL BE A MINIMUM OF 3" ABOVE ADJACENT GRADE. SEE EQUIPMENT PAD DETAILS '3' ON SHEET M-3.
- PROVIDE AND INSTALL HORIZONTAL DISCHARGE PACKAGED AIR CONDITIONING UNIT ON CONCRETE HOUSEKEEPING PAD AT GRADE. PAD TO BE INSTALLED BY G.C. INSTALL CONDENSATE TRAP AND ROUTE TO GRADE. SEE PACKAGED AIR CONDITIONING UNIT SCHEDULE ON SHEET M-3. SEE SPECIFICATIONS ON SHEET M-4.
- EXISTING LOUVER TO BE REMOVED. SEE DEMOLITION PLAN ON THIS SHEET. CONTRACTOR TO ROUTE NEW SUPPLY AND RETURN DUCTWORK THRU EXISTING OPENING AS SHOWN. CONTRACTOR TO FILL IN THE REMAINDER OF THE OPENING WITH DOUBLE WALL INSULATED SHEET METAL. CONTRACTOR TO INSURE THE OPENING IS WEATHERTIGHT.
- EXTERIOR DUCTWORK TO BE INSULATED AND WEATHERIZED PER SPECIFICATIONS ON SHEET M-4. MAINTAIN A MINIMUM OF 6" GROUND CLEARANCE AND PROVIDE DUCT SUPPORTS AS NECESSARY.
- 24x22 SUPPLY DUCT TO BE ROUTED IN THRU EXISTING LOUVER OPENING, ROUTED UP VERTICALLY, AND THEN HORIZONTALLY TO EXISTING MAIN. TRANSITION AS NECESSARY AND CONNECT TO EXISTING MAIN. ELBOWS SHALL BE CONSTRUCTED WITH TURNING VANES.
- 22x24 RETURN DUCT TO BE ROUTED IN THRU EXISTING LOUVER OPENING, ROUTED UP VERTICALLY, AND THEN HORIZONTALLY TO EXISTING MAIN. TRANSITION AS NECESSARY AND CONNECT TO EXISTING MAIN.
- 20x44 SUPPLY DUCT TO BE ROUTED IN THRU EXISTING LOUVER OPENING, ROUTED UP VERTICALLY, AND THEN HORIZONTALLY TO NEW HEATING COIL AND EXISTING MAIN. TRANSITION AS NECESSARY AND CONNECT TO COIL AND EXISTING MAIN. ELBOWS SHALL BE CONSTRUCTED WITH TURNING VANES.
- 44x20 RETURN DUCT TO BE ROUTED IN THRU EXISTING LOUVER OPENING, ROUTED UP VERTICALLY, AND THEN HORIZONTALLY TO EXISTING MAIN. TRANSITION AS NECESSARY AND CONNECT TO EXISTING MAIN.
- EXISTING CONCRETE HOUSEKEEPING PAD TO REMAIN. M.C. SHALL CLEAN EXISTING CONCRETE HOUSEKEEPING PAD AND PAINT EDGE OF PAD WITH REFLECTIVE YELLOW CAUTION PAINT.
- HYDRONIC HEATING COIL TO BE INSTALLED IN NEW SUPPLY DUCTWORK. COIL SHALL HAVE FLANGED CONNECTION AND SHALL BE INSTALLED PER MANUFACTURER'S REQUIREMENTS. INSTALL DRAIN PAN UNDER COIL, AND ROUTE DRAIN TO EXISTING FLOOR DRAIN.
- CONNECT 1 1/2" HWS AND HWV FROM EXISTING BRANCH SERVING REMOVED AHU COIL AND CONNECT TO NEW HEATING WATER COIL MOUNTED IN DUCTWORK. SEE HEATING WATER COIL PIPING DIAGRAM '1' ON SHEET M-3. EXISTING PUMP AND CONTROL VALVE SHALL REMAIN.
- EXISTING RELIEF FAN TO REMAIN. **BASE BID:** THE CONTROLS SHALL REMAIN THE SAME. **ALTERNATE M-1:** THE CONTROLS OF THE VAV BOX SHALL BE MODIFIED AND/OR REPLACED AS NECESSARY FOR NEW OPEN PROTOCOL FRONT END SYSTEM.
- EXISTING HEATING WATER PUMP TO REMAIN.
- EXISTING BOILER TO REMAIN.
- EXISTING DOMESTIC WATER HEATER TO REMAIN.
- EXISTING AIR COMPRESSOR TO REMAIN.
- EXISTING ELECTRICAL EQUIPMENT. SEE ELECTRICAL DRAWINGS.
- EXISTING RETURN GRILLES TO REMAIN UNCHANGED.
- EXISTING BOILER ROOM VENTILATION FAN TO REMAIN.
- EXISTING CONTROL SYSTEM. **BASE BID:** THE EXISTING CONTROLS ARE TO BE MODIFIED AS NECESSARY TO ACCOMMODATE EQUIPMENT INDICATED TO BE REMOVED OR MODIFIED, AND TO CONTROL NEW PACKAGED UNITS BEING ADDED TO THE SYSTEM. **WORK ON EXISTING CONTROLS SHALL BE COMPLETED BY MANUFACTURER CERTIFIED SERVICE PERSONNEL. ALTERNATE M-1:** FRONT END OF CONTROL SYSTEM SHALL BE REPLACED WITH BAGNET OPEN PROTOCOL SYSTEM. MODIFY AND/OR REPLACE OTHER CONTROLS COMPONENTS THROUGHOUT SYSTEM AS NECESSARY TO ENSURE SYSTEM FUNCTIONALITY AND DESIRED OPERATION.



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**MECHANICAL DEMO AND ENLARGED PLANS**

**ISSUED DATE**  
08-30-2018 OWNER REVIEW  
09-20-2018 BIDDING/PERMIT

DRAWN BY: SAB

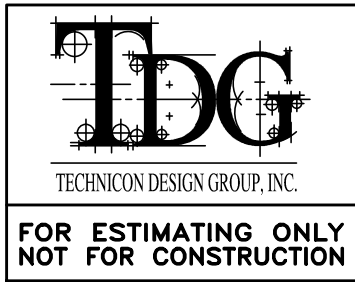
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DATE: 06-18

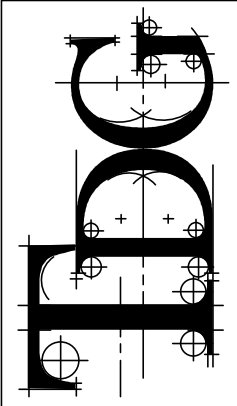
PLOT SCALE: AS NOTED

JOB NO. 36-2416-18

SHEET  
**M-2**  
OF 4 SHEETS



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MECHANICAL DETAILS  
AND SCHEDULES

ISSUED DATE

08-30-2018 OWNER REVIEW  
09-20-2018 BIDDING/PERMIT

DRAWN BY: SAB

CHECKED BY: SAB

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PLOT SCALE: AS NOTED

JOB NO. 36-2416-18

SHEET  
M-3

OF 4 SHEETS

## PACKAGED AIR CONDITIONING UNIT SCHEDULE

TAG	LOCATION	COOLING				HEATING				FAN		MOTOR		ELECTRICAL			MINIMUM OUTSIDE AIR	MAKE	MODEL	REMARKS	
		TOTAL (MBH)	SENSIBLE (MBH)	REFRIGERANT	EER	I/EER	INPUT	OUTPUT	FUEL	EFF	CFM	ESP	HP	RPM	POWER	MCA					MOP
RTU-1	GRADE	87.1	60.8	R410A	11.2	13.1	---	---	---	---	3000	0.6	3	---	460/3/60	21.2	25	400	JOHNSON CONTROLS	J07ZFC00R4B2BCA2A2	NOTE 1
RTU-2	GRADE	245.1	162.6	R410A	10.0	12.5	---	---	---	---	6800	0.7	5	---	460/3/60	51.5	60	1015	JOHNSON CONTROLS	J20ZFC00P4B2BCA4A1	NOTE 1

1. PROVIDE UNIT WITH TWO STAGE COOLING, SIDE DUCT FLANGES, VARIABLE FREQUENCY DRIVE SUPPLY FAN MOTOR, BELT DRIVEN MOTOR, DRY BULB ECONOMIZER WITH BAROMETRIC RELIEF, BAGNET CONTROLLER, RETURN AIR SMOKE DETECTOR, ANTI-SHORT CYCLE TIMER, COIL GUARD STANDARD FILTERS, FROSTAT, AND NON-FUSED ELECTRICAL DISCONNECT.

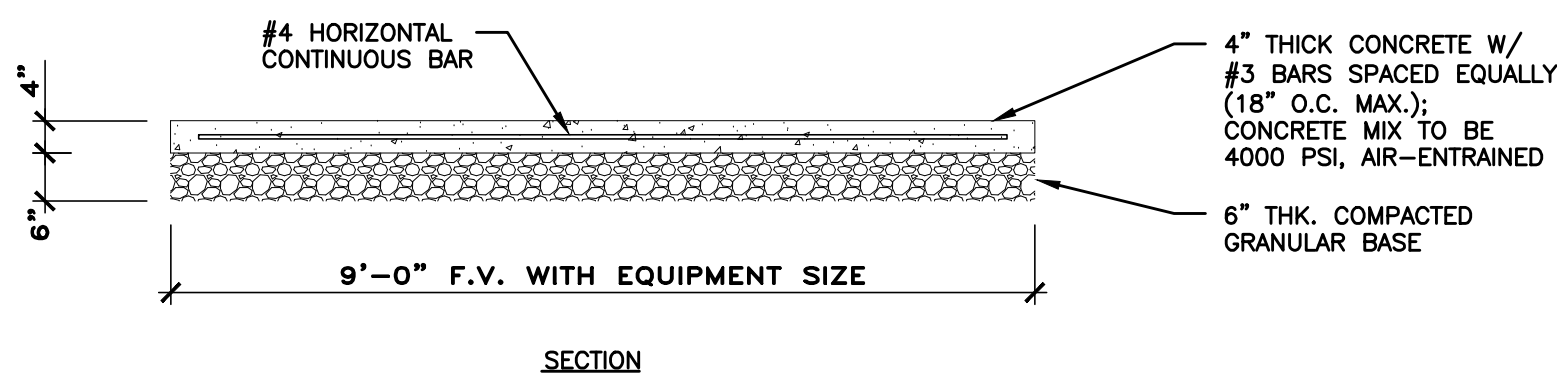
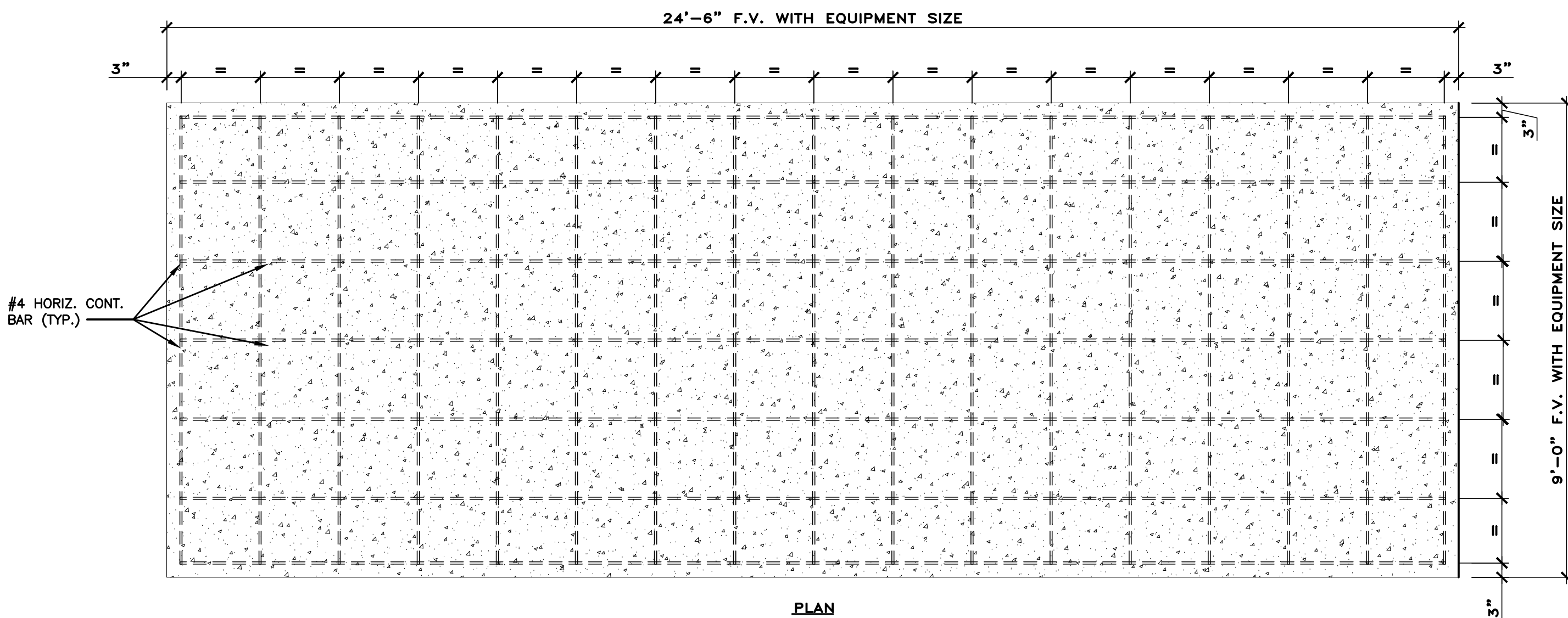
## VENTILATION SCHEDULE

ROOM NUMBER	ROOM	NET ROOM AREA [A <sub>r</sub> ] (SQ FT)	ACTUAL OCCUPANCY [P <sub>z</sub> ]	NATURAL VENTILATION (OMC SECTION 402)			MECHANICAL VENTILATION (OMC SECTION 403)						REMARKS
				REQUIRED OPERABLE AREA (SQ FT)	PERCENT	ACTUAL OPERABLE AREA (SQ FT)	AREA OUTDOOR AIR RATE [R <sub>o</sub> ] (CFM/SQ FT)	PEOPLE OUTDOOR AIR RATE [R <sub>p</sub> ] (CFM/PERSON)	BREATHING ZONE OUTDOOR AIRFLOW [V <sub>bz</sub> ] (CFM)	ZONE AIR DISTRIBUTION EFFECTIVENESS [E <sub>z</sub> ]	ZONE OUTDOOR AIRFLOW [V <sub>oz</sub> ] (CFM)	ACTUAL OUTSIDE AIRFLOW (CFM)	
101	LOBBY	268	0				0.06	0	16	0.8	20	20	NOTE 1
102	RECEPTION	180	1				0.06	5	16	0.8	20	20	NOTE 1
103	CORRIDOR	44	0				0.06	0	3	0.8	3	3	NOTE 1
104	WORK ROOM	71	1				0.06	5	9	0.8	12	12	NOTE 1
105	OFFICE	181	1				0.06	5	16	0.8	20	20	NOTE 1
106	OFFICE	189	1				0.06	5	16	0.8	20	20	NOTE 1
107	CLOSET	20	0				0.12	0	2	0.8	3	3	NOTE 1
108	MEN	38	1				0	70	70	1.0	70	----	NOTE 3
109	WOMEN	38	1				0	70	70	1.0	70	----	NOTE 3
110	CLINIC	142	1				0.06	5	14	0.8	17	17	NOTE 1
111	VESTIBULE	21	0				0.06	0	1	0.8	2	2	NOTE 2
112	WOMEN	176	2				0	70	140	1.0	140	----	NOTE 3
113	MEN	176	3				0	70	210	1.0	210	----	NOTE 3
114	VESTIBULE	22	0				0.06	0	1	0.8	2	2	NOTE 2
115	JANITOR	78	0				0.06	0	5	0.8	6	----	NOTE 3
116	LUNCH	880	30				0.06	5	203	0.8	254	254	NOTE 1
117	RESTROOM	78	1				0	70	70	1.0	70	----	NOTE 3
118	CHANGING	227	2				0.06	5	24	0.8	30	30	NOTE 1
119	OFFICE	369	3				0.06	5	37	0.8	46	465	NOTE 2
120	VESTIBULE	63	0				0.06	0	4	0.8	5	5	NOTE 2
121	MECHANICAL	672	0				0.06	0	40	0.8	50	----	NOTE 3
122	WORK AREA	7522	60				0.06	5	751	0.8	939	939	NOTE 2
123	WORK AREA	147	1				0.06	5	14	0.8	17	17	NOTE 2
124	STORAGE	2202	0	88.1	4.0%	1	0.06	0	132	0.8	165	----	NOTE 3
125	SHIPPING/RECEIVING	1916	3	76.6	4.0%	1	0.06	0	115	0.8	144	----	NOTE 3
126	WORK AREA	2806	4	112.2	4.0%	1	0.06	5	188	0.8	235	----	NOTE 3

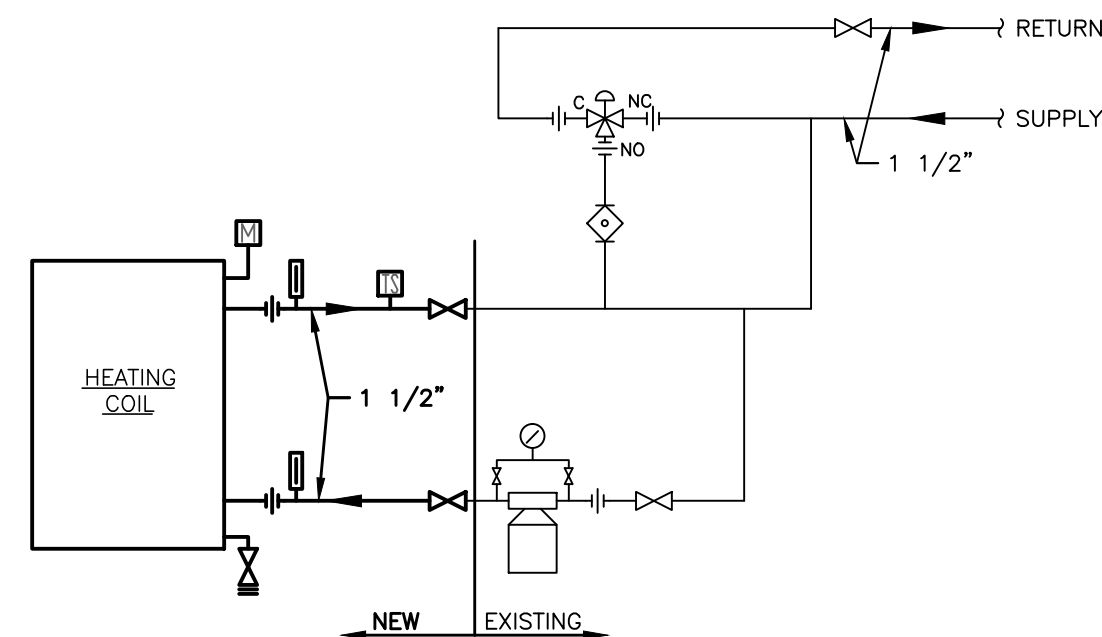
1. VENTILATION OF THIS SPACE IS BY RTU-1.
2. VENTILATION OF THIS SPACE IS BY RTU-2.
3. VENTILATION OF THIS SPACE IS BY EXISTING EXHAUST SYSTEM. NO CHANGE TO THIS SPACE/SYSTEM.
4. VENTILATION OF THIS SPACE IS BY EXHAUST FAN, F-2
5. VENTILATION OF THIS SPACE IS BY AHU-1
6. VENTILATION OF THIS SPACE IS BY RTU-1
7. SPACE IS NOT OCCUPIED.

## COIL SCHEDULE

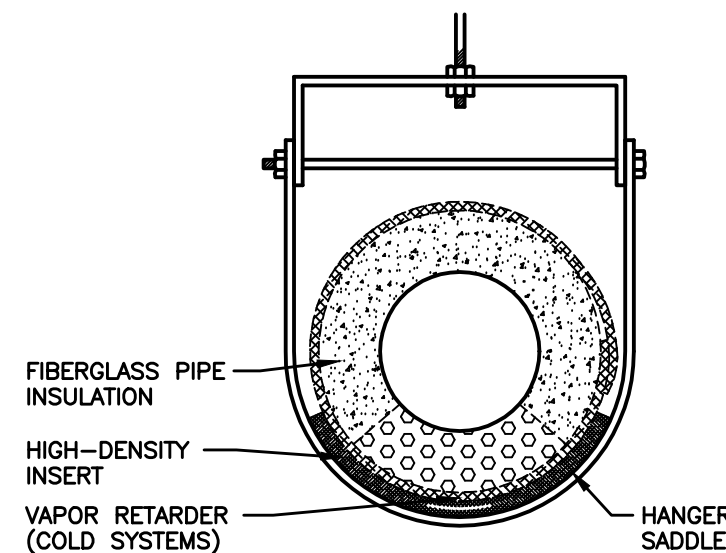
TAG	AIR							WATER				DIMENSIONS	MAKE	MODEL	REMARKS
	CFM	EAT (°F)	LAT (°F)	TOTAL (MBH)	SENSIBLE (MBH)	APD	FACE VEL. (FPM)	GPM	EWT (°F)	LWT (°F)	WPD (FT HD)				
HC-1	6600	55.0	85.1	215.4	----	0.19	660	22	180	160	3.1	60x24	GREENHECK	HW58S01H10-24x60-RH	



3 EQUIPMENT PAD DETAILS  
M-3 SCALE: 1/2"=1'-0"



1 HEATING WATER COIL PIPING DIAGRAM  
M-3 SCALE: NONE



2 CLEVIS HANGER DETAIL  
M-3 SCALE: NONE







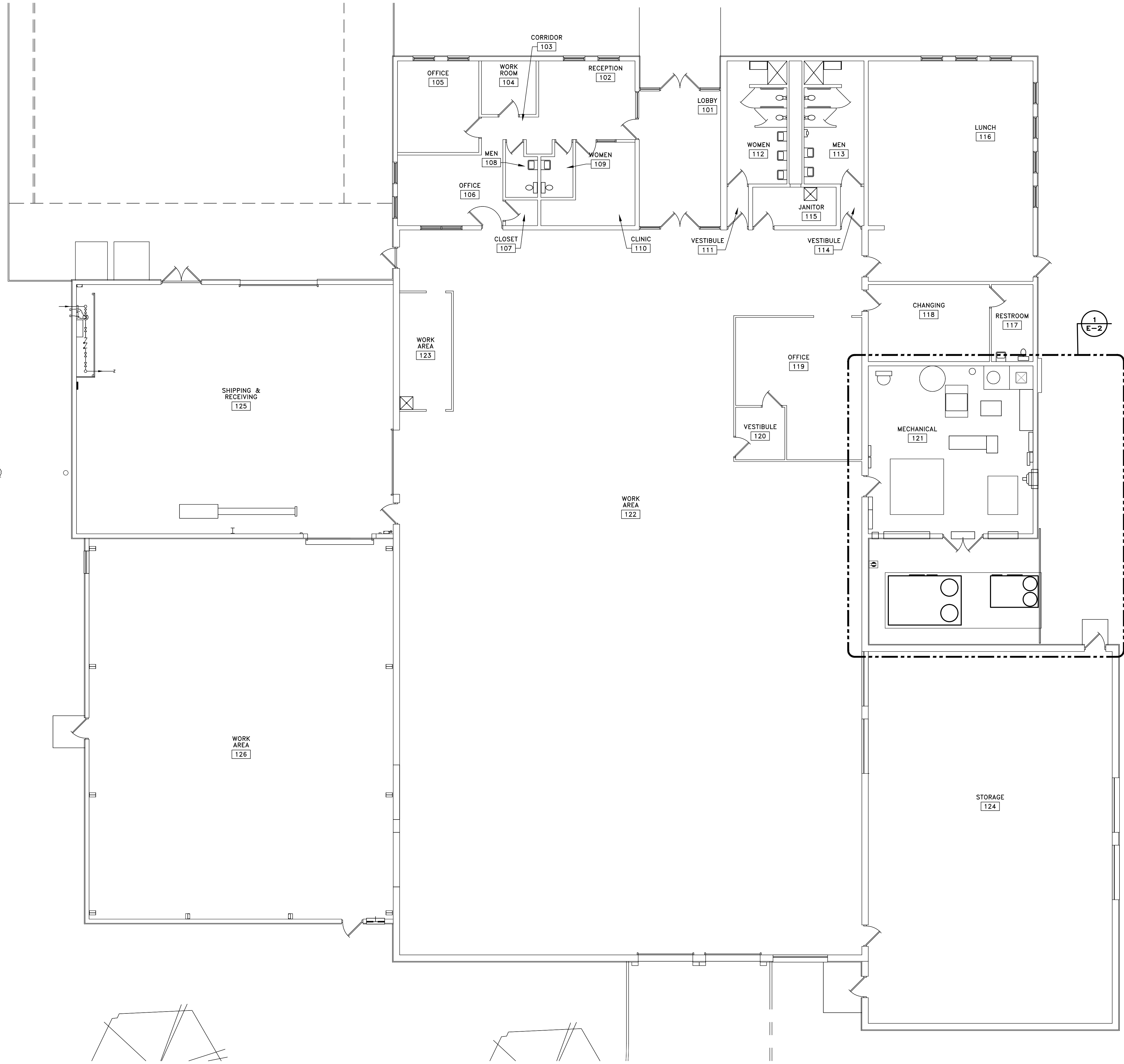
GENERAL ELECTRICAL NOTES:

1. THE CONTRACTOR SHALL KEEP COPIES OF DRAWINGS MARKED IN RED TO CLEARLY INDICATE ALL CHANGES MADE AND THE EXACT LOCATIONS OF CONDUITS CONCEALED UNDER CONCRETE OR PAVING. A COPY OF THESE DRAWINGS SHALL BE SENT TO THE OWNER UPON COMPLETION OF THE JOB. THESE DRAWINGS SHALL BE MARKED AS "ELECTRICAL AS-BUILT DRAWINGS"
2. THE MINIMUM SPACING BETWEEN AND THE CLEARANCE AROUND ELECTRICAL PANELS, MCC'S, CONTROLLERS, SAFETY SWITCHES AND CONTACTORS SHALL BE AS REQUIRED BY THE LATEST ADDITION OF THE NATIONAL ELECTRICAL CODE ARTICLE 110-26, TABLE 110-26a, CONDITIONS 2 AND 3, AS NOTED ON THE DRAWINGS OR AS REQUIRED BY LOCAL ORDINANCES.
3. CONDUCTORS SHALL BE AS FOLLOWS:  
A. ALL CONDUCTORS SHALL BE COPPER STRANDED.  
B. ALL CONDUCTORS SHALL BE TYPE "THWN" OR "THHN" UNLESS SHOWN OTHERWISE.  
C. CONDUCTOR COLOR CODE SHALL BE AS FOLLOWS:  

PHASE	120/208V	277/480V
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
NEUTRAL	WHITE	GRAY
E.G. GROUND	GREEN	GREEN
4. ALL EQUIPMENT EXPOSED TO THE WEATHER OR WET CONDITIONS SHALL BE NEMA 4X OR NEMA 3R WHERE INDICATED.
5. INSTALL A NEATLY TYPED COPY OF THE APPLICABLE PANEL SCHEDULE INSIDE EACH PANEL DOOR AND PLACE INSIDE A PLASTIC COVER. USE PANEL SCHEDULE SHEETS AS A GUIDE.
6. ALL CONDUIT SHALL HAVE EQUIPMENT GROUND WIRE INCLUDING LIGHTING AND RECEPTACLE CIRCUITS.
7. ALL SURFACE MOUNTED OUTLETS AND DEVICE BOXES SHALL BE ONE PIECE CAST OR WELDED CONSTRUCTION UNITS SHALL HAVE NO OPENINGS, OTHER THAN THOSE REQUIRED FOR EQUIPMENT USE, THAT ARE NOT CLOSED BY A THREADED PLUG.
8. ALL CONDUITS, APPROVED FOR DIRECT BURIAL, SHALL BE BURIED A MINIMUM OF 24" DP OR PER N.E.C. TABLE 300.5 AND SHALL BE A MINIMUM OF 1" IN DIAMETER, UNLESS OTHERWISE NOTED.
9. SPICES: CONDUCTORS SHALL NOT BE SPICED EXCEPT IN OUTLETS OR JUNCTION BOXES, TROUGHS, AND GUTTERS OR WIREWAYS. JUNCTION BOXES MAY BE UTILIZED WHERE REQUIRED. CONDUCTORS #10 AWG AND SMALLER SHALL BE SPICED BY TWISTING AND INSTALLATION OF 3M "SCOTCH-LOKS" OR T&B "PIGGY" CONNECTORS. CONDUCTORS #8 AWG AND LARGER SHALL BE SPICED WITH APPROVED MECHANICAL CONNECTORS, PLUS GUM TAPE. UNDERWRITER'S LABORATORIES LISTED, FOR USE AS SOLE INSULATION. THE GUM TAPE SHALL BE APPLIED SO AS TO COVER ALL EDGES AND FORM A SMOOTH SURFACE FOR PLASTIC TAPE. THE FINISHED CONNECTION SHALL HAVE AN INSULATION VALUE EQUAL TO THAT OF THE CONDUCTOR INSULATION.
10. JUNCTION BOX TO BE SUPPORTED FROM JOISTS OR PURLINS USING BRACKETS LISTED TO MAINTAIN BOX STABILITY WITH CABLE SUSPENDED FROM IT.
11. PROVIDE BONDING FOR ALL METAL RACEWAYS THAT CONTAINS GROUNDING ELECTRODE AS PER LATEST EDITION OF THE NEC, 250-92 (3).
12. CONTRACTOR SHALL VISIT AND SURVEY THE SITE THOROUGHLY TO INSPECT CONDITIONS AFFECTING THE WORK. CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR ALL CONDITIONS INCLUDING BUT NOT LIMITED TO ACCESS AND WORK SPACE LIMITATIONS.
13. E.C. SHALL VERIFY CONDUCTOR SIZES SHOWN ARE SIZED FOR THE RUN LENGTHS FROM PANEL TO PROVIDE POWER WITHIN VOLTAGE DROP LIMITS.
14. FIELD VERIFY DIMENSIONS AND EXACT LOCATIONS OF ALL NEW MATERIALS AND COORDINATE ALL WORK WITH GENERAL CONTRACTOR AND ALL OTHER TRADES PRIOR TO FABRICATING OR INSTALLING ANY WORK.
15. ELECTRICAL CONTRACTOR SHALL COORDINATE FINAL POWER CONNECTIONS FOR ALL MECHANICAL EQUIPMENT & FABRICATING EQUIPMENT WITH THE M.C. & OWNER.
16. RECEPTACLE & SWITCH MOUNTING HEIGHT IS TO BOTTOM OF BOX, U.N.O., SEE PLANS & LEGENDS FOR HT.
17. VERIFY VOLTAGE, AMPERAGE, CIRCUITS, WIRE AND CONDUIT SIZE OF ALL FIXTURES AND EQUIPMENT PRIOR TO INSTALLATION.
18. VERIFY POWER LOADS AT EACH BRANCH CIRCUIT PRIOR TO INSTALLATION.

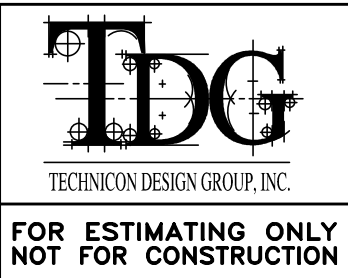
ELECTRICAL ABBREVIATIONS

ELECTRICAL CONTRACTOR	E.C.
PLUMBING CONTRACTOR	P.C.
GENERAL CONTRACTOR	G.C.
MECHANICAL CONTRACTOR	M.C.
FIRE PROTECTION CONTRACTOR	F.P.C.
AUTHORITY HAVING JURISDICTION	A.H.J.
ABOVE FINISHED FLOOR	A.F.F.
UNLESS NOTED OTHERWISE	U.N.O.
COVER PLATE	C.P.
NATIONAL ELECTRIC CODE	N.E.C.
NIGHT LIGHT	NL
COPPER CONDUCTORS	CU
ALUMINUM CONDUCTORS	ALUM
ARC-FAULT CIRCUIT INTERRUPTER	AFCI
GROUND-FAULT CIRCUIT INTERRUPTER	GFCI
UNDERGROUND OR OVERHEAD CONDUIT	-----

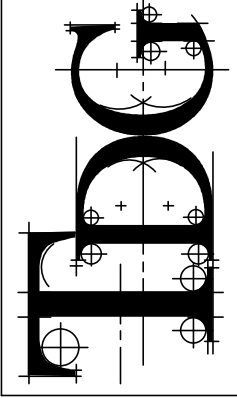


FLOOR PLAN - ELECTRICAL

SCALE: 1/8"=1'-0"



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HVAC REPLACEMENT  
**BROOKHILL INDUSTRIES, INC.**  
**7989 STATE ROUTE 108**  
**OTTAWA, OH, 45875**

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ELECTRICAL PLAN  
GENERAL NOTES

ISSUED DATE	
08-30-2018	OWNER REVIEW
09-20-2018	BIDDING/PERMIT


DRAWN BY: KAN

CHECKED BY: SAB

DATE: 06-18

PLOT SCALE: AS NOTED

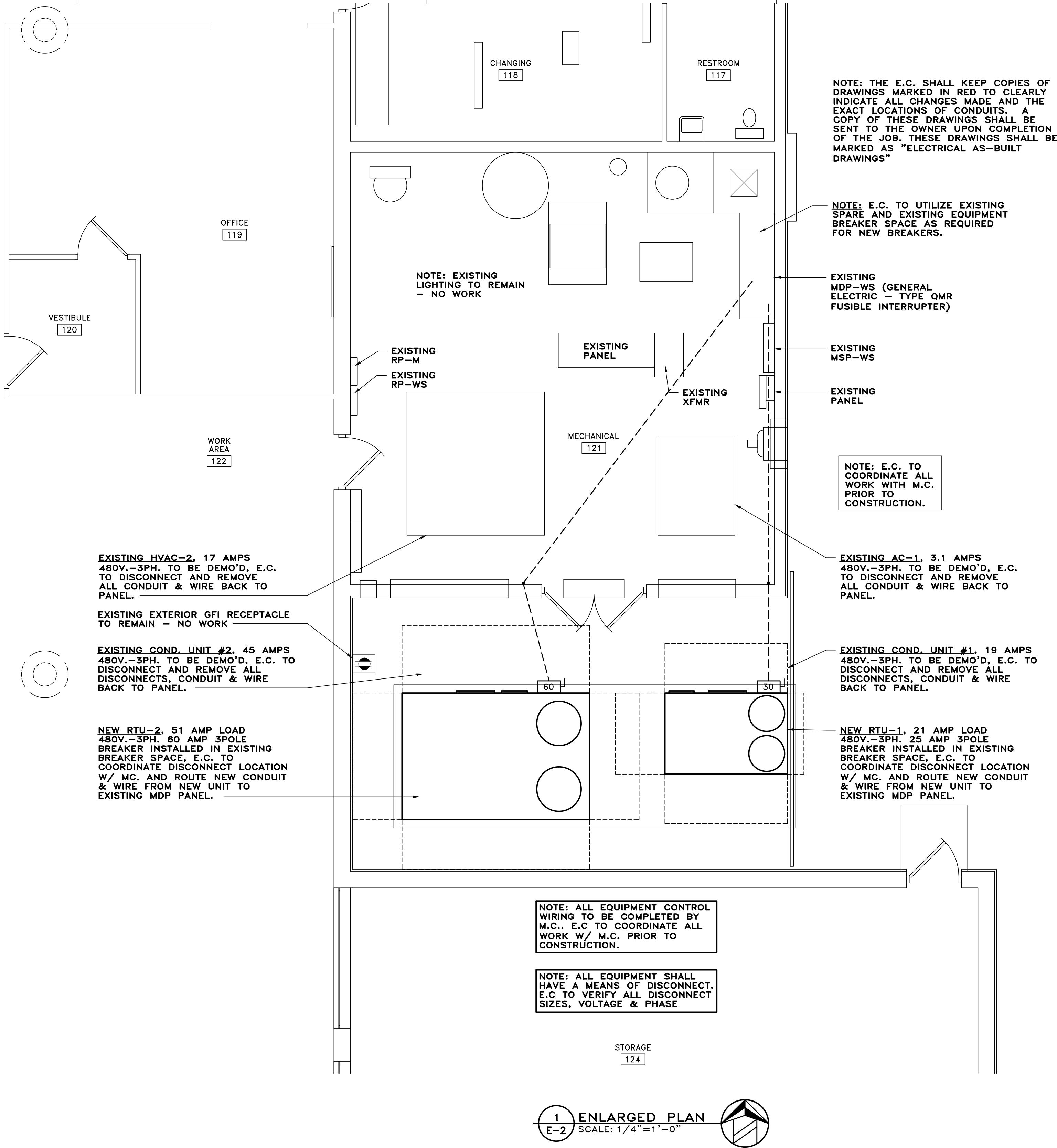
JOB NO. 36-2416-18

SHEET  
E-1  
OF 3 SHEETS

ELECTRICAL BRANCH CIRCUITS (1Ø)	
AMP/VOLT/PHASE	WIRE & CONDUIT
20/120/1	3 #12 THHN WIRES W/ #12 GRD. IN 1/2"C. MIN.
20/208/1	3 #12 THHN WIRES W/ #12 GRD. IN 1/2"C. MIN.
30/208/1	3 #10 THHN WIRES W/ #10 GRD. IN 1/2"C. MIN.
40/208/1	3 #8 THHN WIRES W/ #10 GRD. IN 3/4"C. MIN.
50/208/1	3 #8 THHN WIRES W/ #10 GRD. IN 3/4"C. MIN.
208V WIRE SIZE AS NOTED OR PER AMPERAGE REQUIRED WITH GROUND, 2 POLE WIRES AS PER N.E.C.	

ELECTRICAL BRANCH CIRCUITS (3Ø)	
AMP/VOLT/PHASE	WIRE & CONDUIT
40/208/3	4 #8 THHN WIRES W/ #10 GRD. IN 3/4"C. MIN.
50/208/3	4 #8 THHN WIRES W/ #10 GRD. IN 3/4"C. MIN.
60/208/3	4 #6 THHN WIRES W/ #8 GRD. IN 1"C. MIN.
70/208/3	4 #4 THHN WIRES W/ #8 GRD. IN 1 1/4"C. MIN.
80/208/3	4 #4 THHN WIRES W/ #8 GRD. IN 1 1/4"C. MIN.
208V WIRE SIZE AS NOTED OR PER AMPERAGE REQUIRED WITH GROUND, 3 POLE WIRES AS PER N.E.C.	

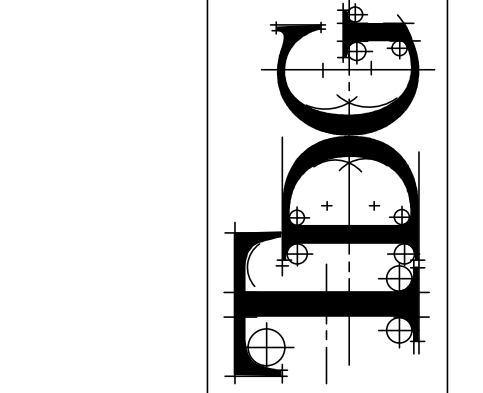
ELECTRICAL BRANCH CIRCUITS 480V (3Ø)	
AMP/VOLT/PHASE	WIRE & CONDUIT
20/480/3	4 #12 THHN WIRES W/ #12 GRD. IN 1/2"C. MIN.
30/480/3	4 #10 THHN WIRES W/ #10 GRD. IN 1/2"C. MIN.
40/480/3	4 #8 THHN WIRES W/ #10 GRD. IN 3/4"C. MIN.
50/480/3	4 #8 THHN WIRES W/ #10 GRD. IN 3/4"C. MIN.
60/480/3	4 #6 THHN WIRES W/ #8 GRD. IN 1"C. MIN.
480V. WIRE SIZE AS NOTED OR PER AMPERAGE REQUIRED WITH GROUND, 3 POLE WIRES AS PER N.E.C.	



Power Legend									
TYPE	Description	MFR	Model	Mounting Height (A.F.F.)	Cover Plate Color	V	PH	Amps	Nema
	Heavy Duty Safety Switch	Square D							1R/3R
	G.F.I. Receptacle	Hubbell	GF5362W	44"	White	120	1	20	
	Thermostat			48" to Top					
	Junction Box			See Plan	Blank				
NOTES LEGEND									
1	E.C. to verify size w/ equipment & mount per N.E.C.								
2	E.C. to verify NEMA configuration w/ equipment								
3	M.C. to furnish & install, See mechanical drawings								
4	Wiring and/or conduit from J-box to panel								



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ELECTRICAL PLAN  
POWER LEGEND

ISSUED DATE  
08-30-2018 OWNER REVIEW  
09-20-2018 BIDDING/PERMIT

DRAWN BY: KAN  
CHECKED BY: SAB  
DATE: 06-18  
PLOT SCALE: AS NOTED  
JOB NO. 36-2416-18  
SHEET E-2  
OF 3 SHEETS



