















PANEL TAG A	
PANEL LOCATION	
VOLTAGE	120/208 Wye
PHASE	3
RATED AMPS	200 A
MCB	200 A
WIRE	4
AIC	25K
MOUNTING	Surface

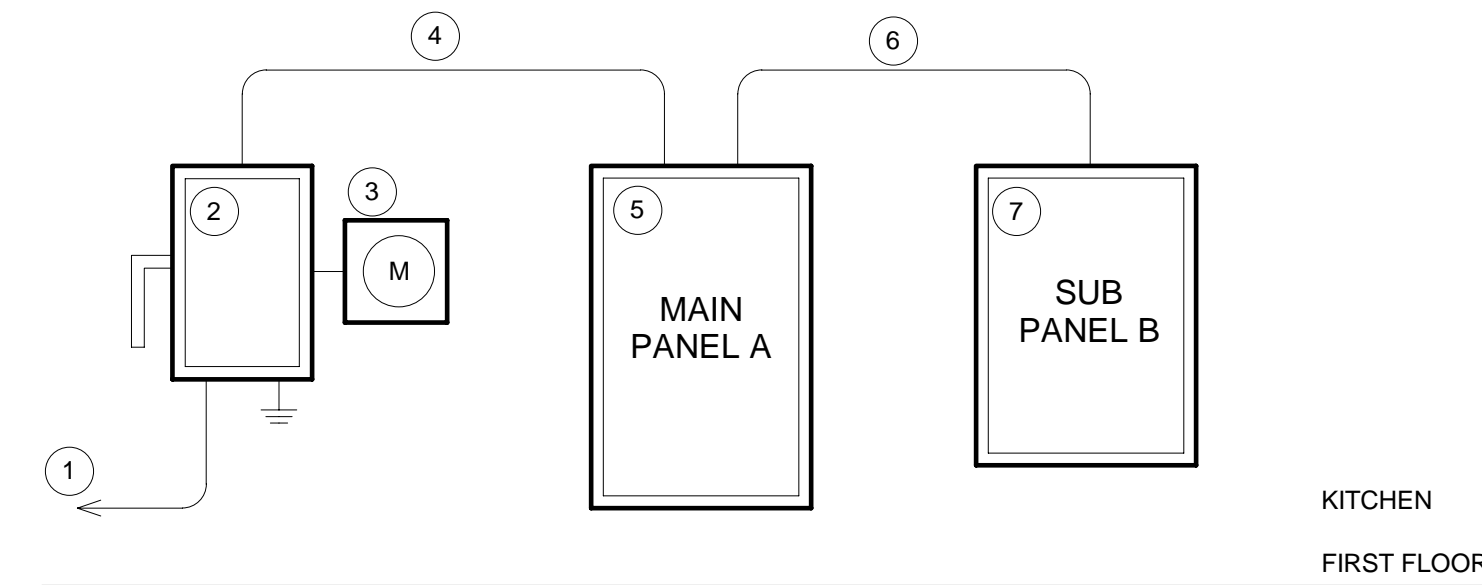
CIRCUIT	DESCRIPTION	NEW/EXIST.	LOAD TYPE	BREAKER SIZE	POLES	Wire Size	A	B	C	A	B	C	Wire Size	POLES	BREAKER SIZE	LOAD TYPE	NEW/EXIST.	DESCRIPTION	CIRCUIT
1	WALK IN COOLER		M	15 A	1	1-#12, 1-#12, 1-#14	0.0			0.2			1-#12, 1-#12, 1-#14	1	15 A	R		FRYERS	2
3	EF-1 & 2		M	15 A	1	1-#12, 1-#12, 1-#14		0.2			0.5		1-#12, 1-#12, 1-#14	1	15 A	R		FRENCH FRY WARMER	4
5	VERTICAL BROILER		R	15 A	1	1-#12, 1-#12, 1-#14			0.2			0.6	1-#12, 1-#12, 1-#14	1	15 A	R		WORK TOP FREEZER	6
7	BAG-N-BOX		R	15 A	1	1-#12, 1-#12, 1-#14	0.5				0.8		1-#12, 1-#12, 1-#14	1	15 A	R		REFRIGERATOR	8
9	MEGA TOP SALAD		R	15 A	1	1-#12, 1-#12, 1-#14		0.8			1.5		1-#8, 1-#8, 1-#8	1	20 A	R		DINING AREA RECEPTACLES	10
11	ANSUL FIRE SYSTEM		NC	15 A	1	1-#12, 1-#12, 1-#14			1.0			1.2	1-#12, 1-#12, 1-#14	1	15 A	R		REFRIGERATOR	12
13	REFRIGERATED...		R	20 A	1	1-#12, 1-#12, 1-#12	1.2				1.6		1-#4, 1-#4, 1-#4	1	20 A	L		FIRST FLOOR LIGHTING	14
15	SECOND FLOOR LIGHTING		L	20 A	1	1-#4, 1-#4, 1-#4		1.5			1.8		1-#12, 1-#12, 1-#12	1	20 A	R		SODA MACHINE	16
17	HOT FOOD COUNTER		R	30 A	1	1-#10, 1-#10, 1-#10			1.5			1.6	1-#12, 1-#12, 1-#12	1	20 A	NC		ICE CUBBER	18
19	HEATED HOLDING CABINET		R	20 A	1	1-#12, 1-#12, 1-#12	1.8				0.9		1-#12, 1-#12, 1-#14	1	15 A	R		FREEZER	20
21	FREEZER		R	15 A	1	1-#12, 1-#12, 1-#14		0.9			3.3		3-#12, 1-#12, 1-#12	3	20 A	R; L; M		PANEL B	22
23	COOLER CONDENSER		M	20 A	2	2-#12, 1-#12, 1-#12			0.0			4.5	--	--	--	--		--	24
25	--		--	--	--	--	0.8				4.0		--	--	--	--		--	26
27	HOOD 2		NC	15 A	1	1-#12, 1-#12, 1-#14		1.0			1.8		1-#8, 1-#8, 1-#8	1	20 A	NC		VERTICAL PLATFORM LIFT	28
29	FREEZER		R	15 A	1	1-#12, 1-#12, 1-#14			0.9			1.0	1-#12, 1-#12, 1-#14	1	15 A	R		P.O.S.	30
31	HOOD 1		NC	15 A	1	1-#12, 1-#12, 1-#14	1.0			0.5			3-#12, 1-#14	3	15 A	M		KEF-1	32
33	MAU-1		M	20 A	3	3-#12, 1-#12		1.8			0.5		--	--	--	--		--	34
35	--		--	--	--	--			1.8			0.5	--	--	--	--		--	36
37	--		--	--	--	--	1.8				6.0		3-#6, 1-#10	3	60 A	M		AHU-1	38
39	--		--	--	--	--					6.0		--	--	--	--		--	40
41	--		--	--	--	--					6.0		--	--	--	--		--	42
							A	B	C				TOTAL						
CONNECTED LOAD							21.1	21.7	20.9				63.6						
CONNECTED AMPS							175.8	180.8	174.0				176.6 A						

DEMAND LOAD CALCULATION	FACTOR	CONNECTED LOAD	DEMAND LOAD
CONTINUOUS LOADS (C)			
NON CONTINUOUS LOAD (NC)	100%	6.4	6.4
LIGHTING (L)	125%	4.1	5.1
RECEPTACLES (R) - UNDER / OVER 10kVA	69.81%	25.2	17.6
MOTOR LOADS (M)	100%	27.9	27.9
KITCHEN (K)			
WATER HEATER (WH)			
SUB PANEL (SP)			
DEMAND LOAD			57.0
DEMAND AMPS			158.3 A

PANEL TAG B	
PANEL LOCATION	
VOLTAGE	120/208 Wye
PHASE	3
RATED AMPS	100 A
MCB	100 A
WIRE	4
AIC	25K
MOUNTING	Surface

CIRCUIT	DESCRIPTION	NEW/EXIST.	LOAD TYPE	BREAKER SIZE	POLES	Wire Size	A	B	C	A	B	C	Wire Size	POLES	BREAKER SIZE	LOAD TYPE	NEW/EXIST.	DESCRIPTION	CIRCUIT
1	WATER HEATER		R	15 A	1	1-#12, 1-#12, 1-#14	0.3			0.5			1-#12, 1-#12, 1-#12	1	20 A	R		STORAGE RECEPTACLE	2
3	DINING AREA RECEPTACLES		R	20 A	1	1-#12, 1-#12, 1-#12		1.0			1.0		1-#12, 1-#12, 1-#12	1	20 A	R		ROOF RECEPTACLES	4
5	OFFICE RECEPTACLES		R	20 A	1	1-#12, 1-#12, 1-#12			1.5			1.5	1-#12, 1-#12, 1-#12	1	20 A	R		RESTROOM RECEPTACLES	6
7	BILDING SIGN		L	20 A	1	1-#12, 1-#12, 1-#12	1.0			1.5			1-#10, 1-#10, 1-#10	1	20 A	R		DINING AREA RECEPTACLES	8
9	FIRST FLOOR RECEPTACLES		R	20 A	1	1-#10, 1-#10, 1-#10		1.5			1.0		1-#12, 1-#12, 1-#12	1	20 A	M		AIR CURTAIN	10
11	AIR CURTAIN		M	20 A	1	1-#12, 1-#12, 1-#12			1.0										12
13																			14
15																			16
17																			18
19																			20
21																			22
23																			24
25																			26
27																			28
29																			30
31																			32
33																			34
35																			36
37																			38
39																			40
41																			42
							A	B	C				TOTAL						
CONNECTED LOAD							3.3	4.5	4.0				11.8						
CONNECTED AMPS							27.5	38.4	34.2				32.8 A						

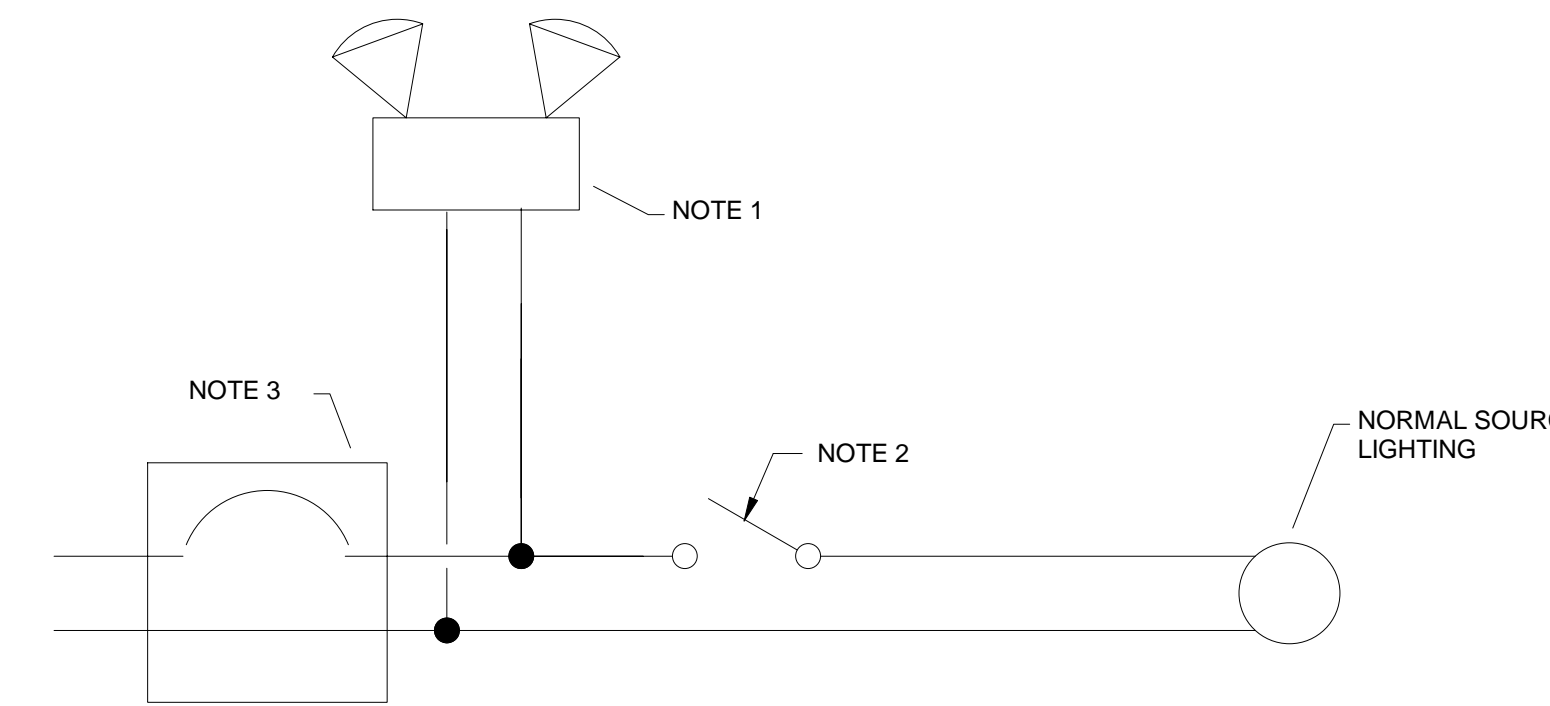
DEMAND LOAD CALCULATION	FACTOR	CONNECTED LOAD	DEMAND LOAD
CONTINUOUS LOADS (C)			
NON CONTINUOUS LOAD (NC)			
LIGHTING (L)	125%	1.0	1.3
RECEPTACLES (R) - UNDER / OVER 10kVA	100%	8.8	8.8
MOTOR LOADS (M)	100%	2.0	2.0
KITCHEN (K)			
WATER HEATER (WH)			
SUB PANEL (SP)			
DEMAND LOAD			12.1
DEMAND AMPS			33.4 A



**ELECTRICAL RISER DIAGRAM**  
NOT TO SCALE

**FEEDER AND EQUIPMENT NOTES**

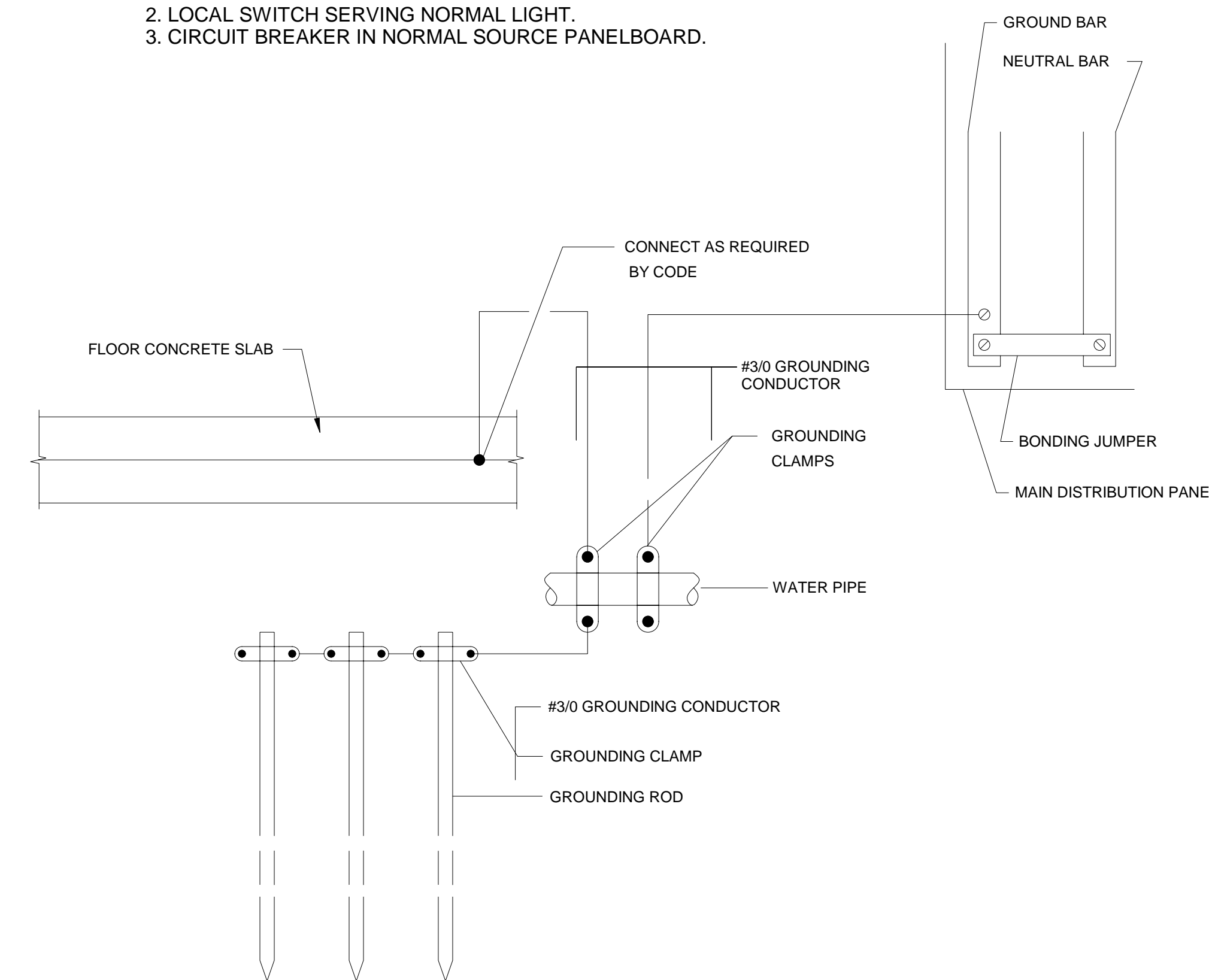
1. INCOMING ELECTRICAL FROM POWER CO.
2. EXISTING MAIN SWITCH 200A 3PH.
3. EXISTING SOCKET METER 200A, 120/208V, 3PH.
4. NEW COPPER FEEDERS 4 #3/0 + 1 #6 GND IN 2" CONDUIT.
5. NEW PANEL "A" 200A, 120/208 V, 3PH, 4 W - SEE PANEL SCHEDULE.
6. NEW COPPER FEEDERS 4 #3 + 1 #8 GND IN 1" CONDUIT.
7. NEW PANEL "B" 100A, 120/208 V, 3PH, 4 W - SEE PANEL SCHEDULE



**EMERGENCY WIRING SCHEMATIC DIAGRAM**  
NOT TO SCALE

**NOTES**

1. SELF CONTAINED UNIT WITH 2 HEAD LIGHT FIXTURE ON THE UNIT TO BE ENERGIZED UPON NORMAL SOURCE FAILURE.
2. LOCAL SWITCH SERVING NORMAL LIGHT.
3. CIRCUIT BREAKER IN NORMAL SOURCE PANELBOARD.



**GROUNDING DETAIL**  
NOT TO SCALE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 45504, Expiration Date: 6/25/2018.

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IAN COZENS  
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HALAL GUYS  
7207 BALTIMORE AVE  
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20740

MARK	DATE	DESCRIPTION
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ISSUE:

PROJECT NO:

CAD FILE:

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SHEET TITLE:

**PANEL SCHEDULE AND DETAILS**

DRAWING SHEET NO:

**E003**



MECHANICAL GENERAL NOTES

SYMBOLS

1. GENERAL

1.1 THE MECHANICAL WORK SHALL CONFORM TO APPLICABLE STATE AND LOCAL CODES AND THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION.

1.2 THE CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS AND PAY FOR ALL PERMITS, FEES, CHARGES AND INSPECTIONS REQUIRED, AS WELL AS HAULING, RIGGING AND TRANSPORTATION CHARGES APPLICABLE TO HIS WORK.

1.3 THE PROJECT SHALL BE BID ON THE BASIS OF SPECIFIED PRODUCT(S) WHICH ESTABLISH MINIMUM QUALITY REQUIREMENTS. WHERE MORE THAN ONE PRODUCT NAME IS INDICATED, BIOS SHALL BE BASED ON ONE OF THE NAMED PRODUCTS. ALL MECHANICAL EQUIPMENT SHOWN ON CONTRACT DOCUMENTS SHALL BE NEW, SHALL BE ALL LISTED AND SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR UNLESS OTHERWISE NOTED.

A) WHERE USE OF AN "ACCEPTABLE EQUAL" PRODUCT REQUIRES CHANGES TO THE BASE BIO DESIGN IN ORDER TO INCORPORATE THE PRODUCT INTO THE PROJECT, THE CONTRACTOR SHALL SUBMIT A LAYOUT SHOWING ALL CHANGES TO ARCHITECTURAL, STRUCTURAL, ELECTRICAL, PLUMBING AND MECHANICAL REQUIREMENTS. CHANGES DUE TO USE OF "ACCEPTABLE EQUAL" PRODUCTS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER AND THE COST OF CHANCES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR LAYOUT SHALL ACCOMPANY PRODUCT SUBMITTAL DATA.

B) SUBSTITUTIONS FOR "ACCEPTABLE EQUAL" PRODUCTS NOT SPECIFIED WILL BE CONSIDERED WHEN INCLUDED WITH SUBMISSION OF THE BID AND SHALL BE SUBJECT TO ACCEPTANCE BY THE ENGINEER. PROPOSALS FOR SUBSTITUTIONS SHALL INCLUDE, BUT NOT BE LIMITED TO: (1) ANY ADDED CREDIT OR COST. (2) PRODUCT IDENTIFICATION. (3) CODE COMPLIANCE. (4) REFERENCED STANDARD COMPLIANCE. (5) DESCRIPTION OF ALL CHANGES INCLUDING ARCHITECTURAL, STRUCTURAL, ELECTRICAL, PLUMBING AND MECHANICAL, REQUIRED TO INCORPORATE SUBSTITUTED PRODUCT INTO THE PROJECT. THE OWNER/ENGINEER RESERVES THE RIGHT TO REJECT PROPOSED SUBSTITUTIONS.

C) WHERE "OR EQUAL" PRODUCTS ARE INDICATED. THE CONTRACTOR SHALL SUBMIT A LIST OF PROPOSED EQUAL SUBSTITUTE PRODUCTS WITH THE BID. THE LIST SHALL INCLUDE ADEQUATE SUPPORTING INFORMATION AS PROOF OF EQUALITY IN ORDER TO BE CONSIDERED ACCEPTABLE. NO LATER SUBSTITUTES WILL BE CONSIDERED.

D) SUBSTITUTIONS SHALL PROVIDE THE SAME GUARANTEE AS SPECIFIED FOR BASE BID PRODUCTS.

1.4 THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS FOR POINTS OF CONNECTIONS, CAPACITIES, AND LOCATIONS OF SYSTEMS. IN ALL AREAS AFFECTED BY THE PROJECT, CUT, PATCH, REPAIR, AND/OR REPLACE ALL MATERIALS DAMAGED AS A RESULT OF WORK. ALL REPAIRED FINISHES SHALL MATCH APPROPRIATE ADJACENT FINISHES. FILL VOIDS AROUND DUCTWORK PENETRATING WALLS WITH FIRE STOPPING MATERIAL.

1.5 MECHANICAL EQUIPMENT AND PRODUCTS SHALL BE LISTED AND/OR LABELED BY AN APPROVED TESTING OR INSPECTION AGENCY IN ACCORDANCE WITH LOCAL AND GOVERNING CODE REQUIREMENTS.

1.6 THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF WORK INCLUDED IN THE PROJECT. DO NOT SCALE THE DRAWING. THE CONTRACTOR SHALL ESTABLISH FINAL DIMENSIONS FROM FIELD MEASUREMENTS. PRIOR TO STARTING WORK. THE WORD "PROVIDE" AS USED IN THE PROJECT SHALL BE DEFINED AS FURNISH AND INSTALL.

1.7 MECHANICAL WORK SHALL BE COORDINATED WITH THE WORK OF ALL OTHER TRADES PRIOR TO INSTALLATION, TO AVOID CONFLICTS AND ALLOCATE SPACE REQUIREMENTS.

1.8 MATERIALS SHALL BE RATES FOR THE OPERATING TEMPERATURE AND PRESSURE OF THE HYDRONIC SYSTEM. MATERIALS SHALL BE SUITABLE FOR THE TYPE OF FLUID IN THE HYDRONIC SYSTEM.

1.9 PROJECT PREMISES SHALL BE THOROUGHLY CLEANED AND READY FOR OCCUPANCY INCLUDING ALL FINISHES OF EQUIPMENT PROVIDED AS PART OF THE CONTRACTOR'S WORK. PROVIDE ONE NEW SET OF CLEAN AIR FILTERS FOR ALL AIR MOVING EQUIPMENT AT PROJECT CLOSEOUT.

1.10 THE WORD "PROVIDE" AS USED IN THE PROJECT SHALL BE DEFINED AS "FURNISH AND INSTALL"

2. PIPING

2.1 PIPING SHOWN IS SCHEMATIC AND DOES NOT INDICATE EVERY OFFSET, ELBOW, UNION, VALVE, TRAP, ACCESS PANEL, ETC., THAT IS REQUIRED FOR A COMPUTE WORKING SYSTEM. PROVIDE ITEMS AND FITTINGS THAT ARE REQUIRED TO INSTALL THE PIPING SYSTEM WITHIN THE SPACE PROVIDED AND THAT ARE REQUIRED FOR A COMPUTE SYSTEM. PIPING SHALL BE PROPERLY SECURED IN ACCORDANCE WITH MSS STANDARD SP-69.

2.2 MATERIALS SHALL BE RATED FOR THE OPERATING TEMPERATURE AND PRESSURE OF DOMESTIC SYSTEM. MATERIALS SHALL BE SUITABLE FOR THE TYPE OF FLUID IN THE DOMESTIC SYSTEM.

2.3 PIPE SUPPORTS SHALL BE SELECTED AND INSTALLED IN ACCORDANCE WITH THE MSS SP-69 OR LOCAL CODES, WHICHEVER IS MORE STRINGENT. UTILIZE TRAPEZE HANGERS FOR PARALLEL RUNS OR PIPING, OTHER THAN SPRINKLER AND WASTE PIPING. COPPER PIPING SYSTEMS SHALL BE SUPPORTED ON COPPER OR COPPER-PLATED SUPPORTS. HANG PIPE FROM SUBSTANTIAL BUILDING STRUCTURE. PIPING SHALL NOT BE HUNG FROM OTHER PIPING. ALL RIGID HANGERS SHALL PROVIDED A MEANS OF VERTICAL ADJUSTMENT AFTER ERECTION. SHIELD SHALL BE PROVIDED BETWEEN HANGERS AND INSULATION.

2.4 WELDING SHALL CONFORM TO CURRENT STANDARDS AND RECOMMENDATIONS OF THE NATIONAL CERTIFIED PIPE WELDING BUREAU, NFPA 51B, STANDARD FOR FIRE PROTECTION; AND NFPA 241, STANDARD FOR SAFEGUARDING CONSTRUCTION, ALTERATION, AND DEMOLITION OPERATIONS.

3. EQUIPMENT

3.1 ALL MECHANICAL EQUIPMENT SHOWN ON CONTRACT DOCUMENTS SHALL BE NEW, AND SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR UNLESS OTHERWISE NOTED.

3.2 EQUIPMENT AND PRODUCT MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS FOR INSTALLATION AND OPERATION SHALL BE FOLLOWED IN PERFORMING MECHANICAL WORK, UNLESS OTHERWISE INDICATED OR DIRECTED. MATERIALS AND METHODS USED IN THE WORK SHALL BE COMPATIBLE WITH BUILDING CONDITIONS AND COMPLY WITH THE BUILDING CODE REQUIREMENTS, WHICH SHALL BE THE BASIS FOR MINIMUM PRODUCT QUALITY. ALL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER BY SKILLED WORKMEN EXPERIENCED IN THEIR TRADE. THE WORK SHALL BE SUBJECT TO THE ACCEPTANCE OF THE OWNER OR THE DULY AUTHORIZED REPRESENTATIVE.

4. DUCTWORK

4.1 DUCTWORK SHALL BE FABRICATED OF GALVANIZED SHEET METAL WITH CONSTRUCTION AND INSTALLATION IN ACCORDANCE WITH SMACNA STANDARDS AND SYSTEM REQUIREMENTS. SHEET METAL GAUGES SHALL CONFORM TO THE INTERNATIONAL MECHANICAL CODE (IMC), ASHRAE STANDARDS, AND UL LISTED FIRE RESISTANCE DIRECTORY REQUIREMENTS AS APPLICABLE.

4.2 DUCT COVERINGS, DUCT LININGS, TAPES, AND CORE MATERIAL SHALL HAVE A FLAME SPREAD RATING NOT OVER 25, AND SMOKE DEVELOPMENT NOT OVER 50.

4.3 ALL NECESSARY ALLOWANCES AND PROVISIONS SHALL BE MADE BY CONTRACTOR FOR BEAMS, COLUMNS OR OTHER OBSTRUCTIONS OF THE BUILDING OR THE WORK OF OTHER CONTRACTORS. WHETHER OR NOT SAME IS INDICATED. WHERE NECESSARY TO AVOID OBSTRUCTIONS. THE DUCTS SHALL BE TRANSFORMED, DIVIDED, OFFSET, RAISED OR LOWERED WITH THE REQUIRED FREE AREA BEING MAINTAINED IN ACCORDANCE WITH SMACNA STANDARDS.

4.4 ALL RECTANGULAR DUCTWORK ELBOWS 30 DEGREE OR GREATER SHALL BE PROVIDED WITH DOUBLE THICKNESS RADIUS TURNING VANES.

4.5 DUCTWORK SIZES SHOWN ARE NET CLEAR INSIDE DIMENSIONS. FOR INTERNALLY LINED DUCTS, FABRICATE SHEET METAL TO ALLOW FOR THICKNESS OF INSULATION AND MAINTAIN NET CLEAR DIMENSIONS.

4.6 DUCTWORK SHALL BE SEALED WITH AN APPROVED DUCT MASTIC OR LIQUID SEALANT AS MANUFACTURED BY UNITED MCGILL CORP., OR APPROVED EQUAL. DUCT SYSTEM LEAKAGE SHALL CONFORM TO SMACNA "HVAC DUCT LEAKAGE TEST MANUAL" FOR CLASS 2" W.C. SEAL CLASS A, LEAKAGE CLASS 24 FOR RECTANGULAR DUCTS AND CLASS 12 FOR ROUND DUCTWORK.

4.7 PROVIDE FIRE DAMPERS IN HVAC AIR DISTRIBUTION SYSTEMS THAT PENETRATE FIRE RATED ASSEMBLIES IN ACCORDANCE WITH THE INTERNATIONAL BUILDING AND MECHANICAL CODES. FIRE DAMPERS SHALL BE TYPE B IN ALL DUCTWORK, IN ADDITION TO SECONDARY FIRE DAMPERS FOR CEILING, WALL AND FLOOR MOUNTED AIR DEVICES.

4.8 COORDINATE SPECIFIC FIRE RESISTIVE CONSTRUCTION REQUIREMENTS WITH THE FIRE RATED ASSEMBLIES INDICATED ON ARCHITECTURAL DRAWINGS. THROUGH PENETRATIONS FIRESTOP SYSTEMS SHALL CONFORM TO UL LISTED FIRE RESISTANCE DIRECTORY OR OTHER METHODS ACCEPTABLE TO LOCAL GOVERNING CODE AUTHORITIES.

4.9 PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS (SUPPLY, RETURN AND EXHAUST) CONNECTED TO AIR HANDLING UNITS, FANS AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE INDICATED.

4.10 PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, COILS, AND OTHER ITEMS LOCATED IN THE DUCTWORK WHICH REQUIRE SERVICE AND/OR INSPECTION. LABEL ACCESS WITH 1/2" LETTERING.

5. INSULATION

5.1 INSULATION MATERIALS SHALL BE CERTAIN-TEED OR APPROVED EQUAL INSULATION MATERIALS SHALL HAVE A FLAME SPREAD RATING NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING OF NOT MORE THAN 50. PROVIDE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS FOLLOWS:

6. DUCT INSULATION

1. SUPPLY/RETURN AIR DUCTWORK (CONCEALED): INSULATE WITH NOMINAL 1-INCH THICK TYPE 75 STANDARD DUCTWRAP WITH FSK FACING VAPOR BARRIER. MINIMUM 3/4-INCH INSTALLED THICKNESS WITH A 5.6 R VALUE.

2. SUPPLY/RETURN AIR DUCTWORK (INTERIOR EXPOSED WHERE INDICATED): INSULATE WITH 1-INCH THICK TYPE 200 ULTRA-LITE ACOUSTICAL DUCT LINER WITH 100 PERCENT ADHESIVE COVERAGE AND MECHANICAL FASTENERS. MINIMUM INSTALLED R VALUE OF 3.1.

3. SUPPLY/RETURN AIR DUCTS (CONCEALED IN ATTIC/CRAWL/ROOF CEILING SPACE): INSULATE WITH NOMINAL 3-INCH THICK TYPE 75 STANDARD DUCTWRAP WITH FSK FACING, VAPOR BARRIER. MINIMUM 2-1/4-INCH INSTALLED THICKNESS WITH 8.5 R VALUE.

4. SUPPLY/RETURN/EXHAUST/OUTSIDE AIR DUCTS (OA DUCTWORK & DUCTWORK EXPOSED TO WEATHER CONDITIONS): INSULATE DUCTWORK EXTERIOR WITH SEMI-RIGID FIBERGLASS BOARD INSULATION, TYPE 1B300, 3.0 LBS/CU. FT. DENSITY, MINIMUM 2-INCH INSTALLED THICKNESS WITH 8.5 R VALUE. PROVIDE WEATHERPROOF FINISH AS MANUFACTURED BY FOSTERS MONOLAR 60 -95 COATINGS (MINIMUM OF 3 COATS) OR APPROVED EQUAL.

5. PROVIDE ALL NECESSARY FOUNDATIONS, SUPPORTS, PADS AND BASES AS REQUIRED FOR MECHANICAL EQUIPMENT, PIPING, AND DUCTWORK AS PER INTERNATIONAL BUILDING AND MECHANICAL CODES. INSTALL EQUIPMENT, PIPING, AND DUCTWORK SO AS TO BE FREE FROM OBJECTIONABLE NOISE AND VIBRATIONS. CONTRACTOR SHALL COORDINATE WORK WITH STRUCTURAL AND ARCHITECTURAL DRAWINGS PRIOR TO ACTUAL WORK.

7. ELECTRICAL WORK

7.1 ELECTRIC MOTORS FOR MECHANICAL EQUIPMENT SHALL BE PROVIDED UNDER THE MECHANICAL WORK UNLESS OTHERWISE NOTED. ALL MOTORS SHALL BE NEMA STANDARD DESIGN FOR QUIET OPERATION AND SIZED TO PROPERLY OPERATE EQUIPMENT AT RATED LOAD. MOTORS WITH BELT DRIVES SHALL BE PROVIDED WITH ADJUSTABLE PULLEYS AND SHAFTS. ELECTRICAL POWER CONNECTIONS FOR MECHANICAL EQUIPMENT SHALL BE PROVIDED UNDER THE ELECTRICAL WORK.

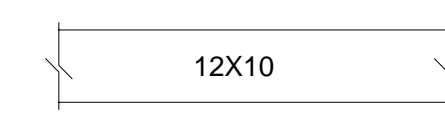
7.2 MOTOR STARTERS, RELAYS, AND CONTACTORS SHALL BE FURNISHED UNDER THE MECHANICAL WORK AND INSTALLED AND POWERED UNDER THE ELECTRICAL WORK. STARTERS, RELAYS, AND CONTACTORS SHALL BE COMPUTE WITH LUGS SIZED FOR SPECIFIED CONDUCTORS AND INCLUDE REQUIRED ACCESSORIES (I.E. START-STOP PUSH BUTTON, PILOT LIGHTS, H.O.A. SWITCH, AUXILIARY CONTACTS AND OVERLOAD PROTECTION), GENERAL PURPOSE NEMA TYPE 1 ENCLOSURES INDOORS, NEMA TYPE 3R ENCLOSURES OUTDOORS. SINGLE PHASE MOTOR STARTERS SHALL BE MANUAL TYPE WITH OVERLOAD PROTECTION, UNLESS OTHERWISE NOTED. THREE PHASE STARTERS SHALL BE MAGNETIC FULL VOLTAGE, NON-REVERSING, UNLESS OTHERWISE NOTED. STARTERS FOR MECHANICAL SYSTEMS SHALL BE AS MANUFACTURED BY SQUARE-D, GENERAL ELECTRIC, OR CUTLER HAMMER. STARTERS SHALL CONFORM TO NEMA STANDARDS AND NATIONAL ELECTRICAL CODE (NEC) REQUIREMENTS. STARTER CONTROL AND INTERLOCK WIRING SHALL BE PROVIDED UNDER THE MECHANICAL WORK. ALL EQUIPMENT SHALL BE FURNISHED W/ MANUFACTURER PROVIDED DISCONNECT SWITCH.

7.3 DUCT SMOKE DETECTORS SHALL BE INSTALLED IN ALL AIR DISTRIBUTION SYSTEMS WITH A DESIGN CAPACITY OF 2000 CFM OR GREATER IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE SECTION 606 AND NATIONAL FIRE PREVENTION CODE NFPA 72 AND 90A. DUCT SMOKE DETECTORS SHALL BE "DUAL CONTACT" TYPE (FOR TIE-IN TO FIRE ALARM SYSTEM AND FOR FAN SHUT-DOWN). COMPLETE WITH SAMPLING TUBE, REMOTE RESET, REMOTE PILOT INDICATOR (FOR CONCEALED APPLICATIONS), UL LISTED FOR INTENDED USE AND COMPLETELY COMPATIBLE WITH FIRE ALARM SYSTEM. DUCT SMOKE DETECTORS SHALL BE FURNISHED AND INSTALLED UNDER THE MECHANICAL WORK AND WIRED AND POWERED UNDER THE ELECTRICAL WORK.

8 CONTROLS

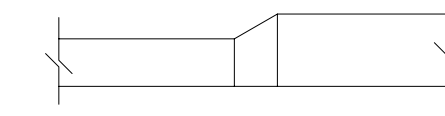
8.1 PROVIDE AUTOMATIC TEMPERATURE CONTROL SYSTEM(S) FOR HVAC EQUIPMENT UNDER MECHANICAL WORK. CONTROL DEVICES SHALL BE PROVIDED BY UNIT MANUFACTURER, UNLESS OTHERWISE NOTED. HVAC EQUIPMENT NOT PROVIDED WITH CONTROL DEVICES SHALL BE PROVIDED WITH DEVICES AS MANUFACTURED TO MATCH BASE BUILDING CONTROLS OR APPROVED EQUAL AIR HANDLER SHALL HAVE NIGHT SET BACK CONTROLLED BY A PROGRAMMABLE THERMOSTAT. DEVICE(S) SHALL BE FULLY COMPATIBLE AND SUITABLE FOR INTENDED USE. CONTROL WIRING SHALL BE PROVIDED IN ACCORDANCE WITH THE NEC FOR 24-VOLT CONTROL SYSTEM(S). WIRING SHALL BE A MINIMUM 22 AWG, COLOR CODED AND INSTALLED IN CONDUIT WHERE SUBJECT TO PHYSICAL DAMAGE OR WHERE REQUIRED TO AVOID PLENUM SPACES. EXTEND ALL LOW VOLTAGE WIRING UNBROKEN BETWEEN EACH CONTROL DEVICE AND EQUIPMENT TERMINAL STRIP. INSTALLATION OF CONTROL SYSTEM(S), WRING, AND DEVICES SHALL BE BY A CERTIFIED CONTROLS CONTRACTOR WITH A MINIMUM OF FIVE (5) YEARS EXPERIENCE IN THE INSTALLATION AND SERVICING OF CONTROLS.

8.2 UNLESS OTHERWISE INDICATED, ALL THERMOSTATS SHALL BE MOUNTED IN ACCORDANCE WITH ADA REQUIREMENTS.



NEW DUCT (1ST DIMENSION INDICATES SIDE SHOWN, INSIDE CLEAR DIMENSIONS)

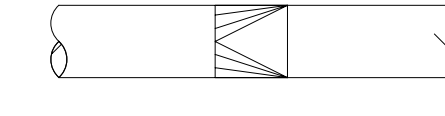
EXISTING TO NEW CONNECTION



DUCT SIZE TRANSITION

PIPING DOWN

PIPING UP



RECTANGULAR/SQUARE DUCT TO ROUND DUCT SIZE TRANSITION

ISOLATION VALVE

EXISTING COLD WATER

EXISTING HOT WATER

EXISTING VENT

EXISTING SANITARY

NEW VENT

NEW SANITARY

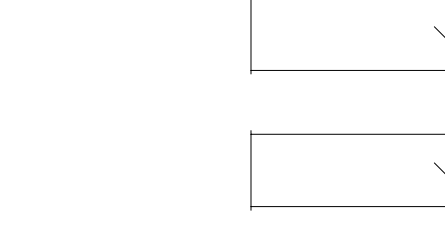
NEW COLD WATER

NEW HOT WATER

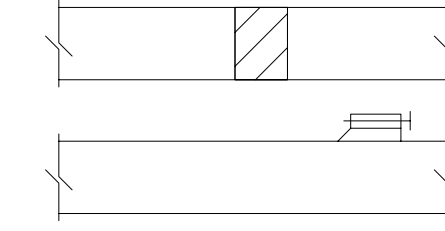
EXISTING GAS LINE

NEW GAS LINE

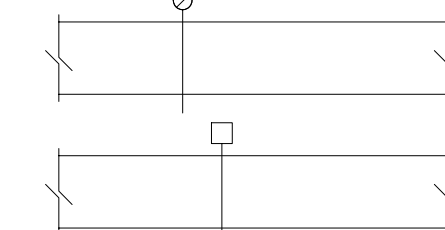
DOUBLE LINE DUCT W/ SIZE IN INCHES



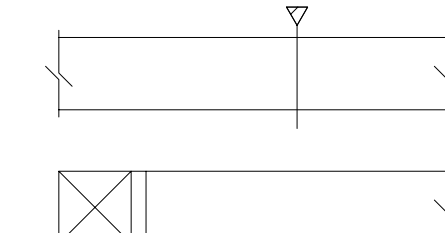
AIR INTO REGISTER/GRILLE



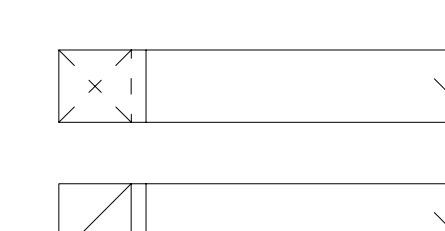
AIR OUT OF REGISTER/GRILLE



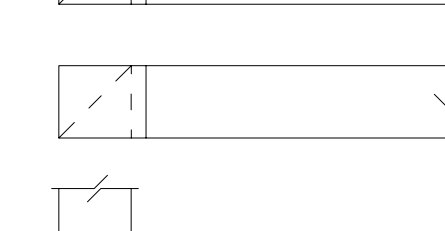
FLEXIBLE DUCT CONNECTOR



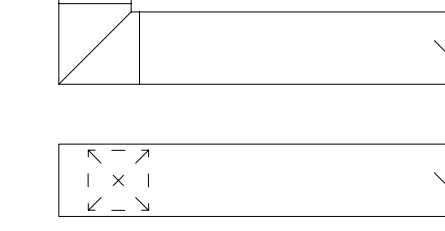
MANUAL VOLUME DAMPER



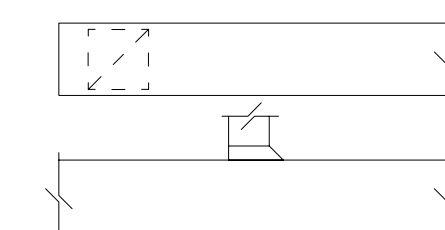
BACKDRAFT DAMPER



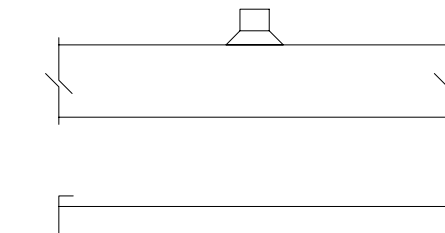
AUTOMATIC (MOTORIZED) VOLUME DAMPER/ SMOKE DAMPER



FIRE DAMPER



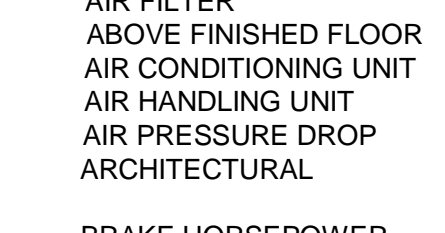
SUPPLY DUCT TO RISE UP



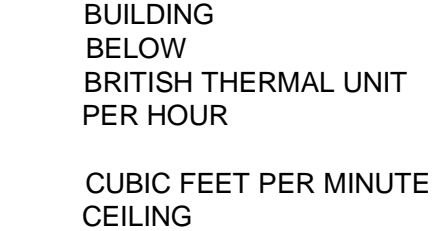
SUPPLY DUCT TO DROP DOWN



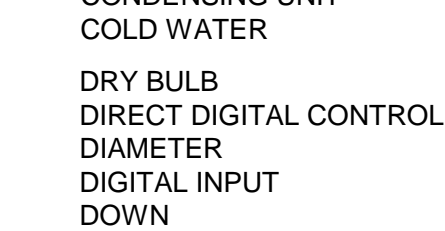
RETURN DUCT TO RISE UP



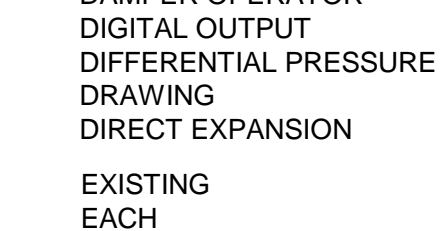
RETURN DUCT TO DROP DOWN



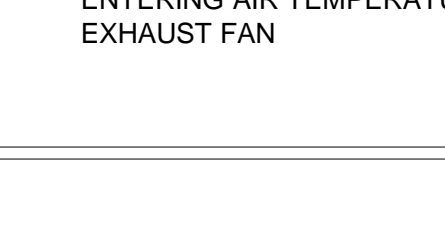
ELBOW WITH TURNING VANES



SUPPLY AIR DEVICE



RETURN OR EXHAUST AIR DEVICE



DUCT WITH DUCT BRANCH



DUCT WITH ROUND DUCT TAKE-OFF



DUCT WITH CAPPED END

CEILING MOUNTED EXHAUST FAN

UNIT TAG TYPE UNIT DESIGNATED NUMBER

THERMOSTAT

SWITCH

DUCT SMOKE DETECTOR

DOOR UNDERCUT

2'x2' SUPPLY DIFFUSER

2'x2' RETURN GRILLE

DIFFUSER TAG TYPE AIR CFM (CUBIC FEET PER MINUTE)

GRILLE TAG TYPE AIR CFM (CUBIC FEET PER MINUTE)

ABBREVIATIONS

AF	AIR FILTER ABOVE FINISHED FLOOR	EQUIP	EQUIPMENT	NO	NORMALLY OPEN
AFF	AIR CONDITIONING UNIT	ESP	EXTERNAL STATIC PRESSURE	NOM	NOMINAL NUMBER
ACU	AIR HANDLING UNIT	EXT	EXTERNAL	No.	NUMBER
AHU	AIR PRESSURE DROP ARCHITECTURAL	F	DEGREE FAHRENHEIT	O.A.	OUTSIDE AIR
APD		FD	FIRE DAMPER	OAT	OUTSIDE AIR TEMPERATURE
ARCH		FL	FLOOR	OFD	OPEN END DUCT
BHP	BRAKE HORSEPOWER	FPM	FEET PER MINUTE	PD	PRESSURE DROP
BLDG	BUILDING	FT	FEET	PS	PRESSURE SENSOR
BLW	BELOW			PSI	POUND PER SQUARE INCH
BTUH	BRITISH THERMAL UNIT PER HOUR	GALV	GALVANIZED	RA	RETURN AIR
CC	CUBIC FEET PER MINUTE	HC	HEATING COIL	RAT	RETURN AIR TEMPERATURE
CLG	CEILING	HP	HEAT PUMP	REFRIG	REFRIGERANT
CU	CONDENSING UNIT	HW	HOT WATER	RLA	RUNNING LOAD AMPERE
CW	COLD WATER	IN	INCH	RPM	REVOLUTION PER MINUTE
DB	DRY BULB	IN. WG.	INCH WATER GAUGE	SA	SUPPLY AIR
DDC	DIRECT DIGITAL CONTROL	KW	KILOWATT	SAT	SUPPLY AIR TEMPERATURE
DI	DIAMETER	LAT	LEAVING AIR TEMPERATURE	SD	SMOKE DETECTOR
DIA	DIGITAL INPUT	LB	POUNDS	SF	SUPPLY FAN
DN	DOWN	LF	LINEAR FEET	STRUC	STRUCTURAL
DO	DAMPER OPERATOR	MAX	MAXIMUM	TD	TRANSFER DUCT
DO	DIGITAL OUTPUT	MBH	1000 BTUH	TS	TEMPERATURE SENSOR
DPS	DIFFERENTIAL PRESSURE SWITCH	MECH	MECHANICAL	TYP	TYPICAL
DWG	DRAWING	MER	MECHANICAL EQUIPMENT ROOM	UNO	UNLESS NOTED OTHERWISE
DX	DIRECT EXPANSION	MIN	MINIMUM	W	WATT
(E)	EXISTING	MOT	MOTORIZED	WB	WET BULB
EA	EACH	NC	NOISE CRITERIA	WC	WATER COLUMN
EAT	ENTERING AIR TEMPERATURE	NC	NORMALLY CLOSED	WMC	WIRE MESH SCREEN
EF	EXHAUST FAN	NIC	NOT IN CONTRACT	WPD	WATER PRESSURE DROP

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 45504, Expiration Date: 6/25/2018.

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