GENERAL ABBREVIATIONS

A	AMPERES	HZ	FREQUENCY
AC	AR CONDITIONING	IN	INCH OR INCHES
AD	ACCESS DOOR	KW	KILOWATT
AFF	ABOVE FINISHED FLOOR	LG	LENGTH
AL	ACOUSTICAL LINING	LAT	LEAVING AIR TEMPERATURE
BHP	BRAKE HORSEPOWER	LBS	POUNDS
BTU	BRITISH THERMAL UNIT	LDB	LEAVING DRY BULB TEMPERATURE
BTUH	BTU PER HOUR	LIN FT	LINEAR FEET
CD	CEILING DIFFUSER	LWB	LEAVING WET BULB TEMPERATURE
CFM	CUBIC FEET PER MINUTE	MAX	MAXIMUM
CG	CEILING GRILLE	MBH	THOUSAND BTU PER HOUR
CLG	CEILING	MHP	MOTOR HORSEPOWER
COMPR	COMPRESOR	MIN	MINI
CR	CEILING REGISTER	NIC	NOT IN CONTRACT
DB	DRY BULB	NO.	NUMBER
DIAM	DIAMETER	NTS	NOT TO SCALE
DN	DOWN	RA	RETURN AIR
DWG	DRAWING	RM	ROOM
DX	DIRECT EXPANSION	RPM	REVOLUTIONS PER MINUTE
EAT	ENTERING AIR TEMPERATURE	SP	STATIC PRESSURE
EDB	ENTERING DRY BULB TEMPERATURE	SPEC	SPECIFICATION
EF	EXHAUST FAN	TEMP	TEMPERATURE
EWB	ENTERING WET BULB	TG	TOP GRILLE
EWT	ENTERING WATER TEMPERATURE	TV	TURNING VANES
°F	DEGREES FAHRENHEIT	TYP	TYPICAL
FC	FLEXIBLE CONNECTION	W	WDTH
FD	FIRE DAMPER	W/	WITH
FIN FL	FINISHED FLOOR	W/O	WITHOUT
FLA	FULL LOAD AMPERES	WB	WET BULB
		WMS	WIRE MESH SCREEN
FPM	FEET PER MINUTE	SG	SUPPLY GRILLE
FT	FEET	RG	RETURN GRILLE
HD	HEAD	SP	SMOKE PURGE
HR	HOUR	#	
MAU	MAKE UP AIR UNIT		

MECHANICAL SPECIFICATIONS

A) AIR CONDITIONING SPECIFICATIONS

1. DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED FOR THE EXACT LOCATION OF EQUIPMENT, PIPING, DUCTWORK, OR OTHER ITEMS.
2. DRAWINGS DO NOT SHOW EVERY DETAIL OF CONSTRUCTION OR INSTALLATION, THE CONTRACTOR SHALL FURNISH AND INSTALL ALL ITEMS REQUIRED FOR A COMPLETE AND WORKING SYSTEM.
3. ALL WORK SHALL BE PERFORMED BY A LICENSED CONTRACTOR IN A FIRST CLASS, WORKMAN-LIKE MANNER, THE COMPLETED SYSTEM SHALL BE OPERATIVE AND ACCEPTANCE BY ENGINEER /ARCHITECT SHALL BE A CONDITION OF THE SUB-CONTRACT.
4. THE CONTRACTOR SHALL PAY FOR ALL PERMITS, FEES, INSPECTIONS, AND TESTS.
5. THE CONTRACTOR SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH ALL ASPECTS OF THE PROJECT AND SHALL VERIFY ALL CONDITIONS PRIOR TO CONSTRUCTION.
6. ALL INSTALLATION SHALL BE COORDINATED BY THE CONTRACTOR WITH OTHER TRADES TO AVOID IMPACTS.
7. ALL REQUIRED CONSTRUCTION INSURANCE FOR PROTECTION AGAINST PUBLIC LIABILITY AND PROPERTY DAMAGE FOR THE DURATION OF THE WORK SHALL BE PROVIDED BY THE CONTRACTOR.
8. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH APPLICABLE NATIONAL, STATE AND LOCAL CODES, RULES AND ORDINANCES.
   THE CODES IN EFFECT FOR THIS PROJECT SHALL THE 2014 EDITION OF FBC WITH REVISIONS AND ALL ASSOCIATED INDUSTRY CODES BY REFERENCE.
9. ALL MATERALS SHALL BE NEW AND SHALL BEAR UNDERWRITERS LABEL WHERE APPLICABLE.
10. EQUIPMENT SHALL BE U.L. APPROVED.
11. THE MECHANICAL CONTRACTOR SHALL PROVIDE A WRITTEN WARRANTY THAT SHALL GUARANTEE ALL WORKMANSHIP AND MATERIALS FOR ONE YEAR FROM THE DATE OF FINAL WORK ACCEPTANCE BY THE OWNER OR OWNER'S REPRESENTATIVE.
12. ARCHITECTURAL AND/OR ENGINEERING EXPENSES THAT ARE INCURRED DUE TO REVISIONS OR SUBSTITUTIONS REQUESTED FOLLOWING THE ISSUE OF APPROVED DRAWINGS SHALL BE PAID FOR BY THE CONTRACTOR.

B) INSTALLATION

1. THE MECHANICAL CONTRACTOR SHALL PROVIDE HVAC EQUIPMENT LISTED IN THE HVAC EQUIPMENT SCHEDULE AND SHALL MEET THE CAPACITIES NOTED.
2. THE MECHANICAL CONTRACTOR SHALL SUBMIT MANUFACTURER SHOP DRAWINGS, CUT SHEETS AND PERFORMANCE DATA ON ALL EQUIPMENT AND OBTAIN THE ENGINEER'S APPROVAL PRIOR TO PURCHASE AND INSTALLATION.
3. THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL MOTOR STARTERS, RELAYS, CONTRACTORS, SMOKE DUCT DETECTORS, ETC.
4. THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL SWITCHES AND INSTALL ALL CONTROL WIRING.
5. A/C UNIT SUPPLY AND RETURN AIR DUCTS SHALL BE R-6 JOHNS MANVILLE MAT-FACED MICRO-AIRE FIBERGLASS DUCT BOARD, TYPE 800 (UL APPROVED) , INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
6. ALL DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED TO S.M.A.C.N.A. STANDARDS. ALL DUCTWORK SIZES ARE INSIDE DIMENSIONS.
   a)ALL 90 DEGREE ELBOWS SHALL BE HAVE A MINIMUM CL RADIUS OF 1.5 R/W (1.5 R/O) OR BE FURNISHED WITH TURNING VANES.
   b)BRANCH TAKEOFFS SHALL BE PROVIDED WITH ADJUSTABLE, ACCESSIBLE AIR SPUTTER DAMPERS.
   c)ROUND DUCT ELBOWS SHALL HAVE A CENTERLINE RADIUS OF NOT LESS THAN 1.5 TIMES THE DIAMETER OF THE DUCT.
7. SECURE FLEXIBLE DUCTS TO BRANCH TAKE-OFF COLLAR WITH HOSE CLAMP.
8. MAXIMUM LENGTH OF ALL FLEXIBLE DUCT SHALL NOT BE MORE THAN 10 FEET, UNLESS OTHERWISE NOTED.
9. ALL EXHAUST AND OUTSIDE AIR DUCT SHALL BE MIN, 24GA GALVANIZED SHEET METAL.
10. ALL DUCT ABOVE THE ROOF TO BE MIN. 16GA SHEET METAL, INSULATED W/ 2" THK RIGID HULL BOARD AND SHEATHED WITH GALV. STEEL. EXTERIOR STEEL TO BE SEALED AND WATERPROOFED, PRIMED AND PAINTED PER ARCHITECTURAL PAINT SCHEDULE.
11. THE MECHANICAL CONTRACTOR SHALL INSTALL SMOKE DUCT DETECTORS IN THE RETURN DUCT OF ALL A/C UNITS EXCEEDING 2000 CFM. SMOKE DETECTOR SHALL BE INTERLOCKED W/ AHU- CONTROLS.
12. AIR DISTRIBUTION ACCESSORIES SHALL BE AS NOTED ON THE PLANS.
13. REFRIGERANT PIPING SHALL BE TYPE "K" COPPER WITH SOLDER FITTINGS.
   a)ALL REFRIGERATION PIPE INSULATION SHALL BE MIN. ½" ARMAFLEX OR EQUAL APPROVED BY THE ENGINEER.
   b)ALL EXTERIOR LIQUID/SUCTION LINES SHALL BE INSULATED, AND WEATHER PROOFED. ALL SUCTION LINES INSIDE THE BUILDING SHALL BE INSULATED.
   c)LIQUID/SUCTION LINES SHALL BE ROUTED INSIDE THE STRUCTURE TO THE EXTENT PRACTICABLE.
   d)THE MECHANICAL CONTRACTOR SHALL SIZE ALL PIPING FOR THE SPECIFIC APPLICATION AND ROUTE OF PIPE.
14. THE MECHANICAL CONTRACTOR SHALL ROUTE CONDENSATE PIPING FOR A LENGTH OF 10 FEET TO A DRAIN SUPPLIED BY THE PLUMBING CONTRACTOR. THE MECHANICAL CONTRACTOR'S CONDENSATE PIPE SHALL INCLUDE A TRAP SIZED FOR AHU FAN STATIC.
15. THE MECHANICAL CONTRACTOR SHALL SET AIR HANDLER UNIT AND CONDENSING UNIT AS SHOWN ON THE DRAWINGS. EQUIPMENT SHALL BE PROVIDED DIM PAD ISOLATORS.
16. ALL OUTDOOR AIR INTAKES SHALL BE PROVIDED WITH BIRO AND INSECT SCREEN OF A CORROSION-RESISTANT MATERIAL. BRO SCREEN SHALL NOT BE LARGER THAN 1/2" MESH AND INSECT SCREEN SHALL NOT BE LARGER THAN 18X14.
17. THERMOSTATS SHALL BE SUPPLIED AND INSTALLED BY THE MECHANICAL CONTRACTOR:
   a)SHALL BE MOUNTED 5'-6" ABOVE FINISHED FLOOR, UNLESS NOTED OTHERWISE.
   b)SHALL BE HEAT/OFF/COOL AND FAN/AUTO/ON SWITCHED AND SHALL BE APPROVED BY AC EQUIPMENT MANUFACTURER.
   c)FURNISH AND INSTALL ALL TEMPERATURE CONTROLS, INCLUDING PROGRAMMABLE THERMOSTAT AND HUMIDISTAT CONTROLS.
18. FIRE DAMPERS SHALL BE INSTALLED IN ALL DUCTS PENETRATING FIRE RATED ROOFS, CEILINGS AND BULKHEADS AS BY CODE, ACCESS DOORS FOR INSPECTION AND RESET SHALL BE PROVIDED AT EACH LOCATION.
   a)FIRE DAMPERS PROVIDED IN KITCHEN EXHAUST DUCT SHALL BE EQUIPPED WITH 212F FUSIBLE LINK.

C) WARRANTIES

1. CORRECTION OF ANY ENGINEERING DEFECT SHALL BE RECTIFIED WITHOUT ADDITIONAL CHARGE AND SHALL NOT INCLUDE REPLACEMENTS OR REPAIR OF ANY OTHER PHASE OF THE INSTALLATION, WHICH MAY HAVE BEEN DAMAGED THEREBY.

2. CONTRACTOR SHALL ADJUST, TEST AND BALANCE ALL SYSTEMS.
   b)BALANCING OF THE SYSTEM SHALL BE BY A CERTIFIED THIRD PARTY.

MECHANICAL LEGEND

SYMBOL	ABBREV.	DESCRIPTION	SYMBOL	ABBREV.	DESCRIPTION
©		COORDINATE WITH ELECTRICAL			LINED DUCTWORK (OR PLENUM)
—CD—	CD	CONDENSATE DRAIN (AC)		CD	DUCT RISE IN DIRECTION OF FLOW
—D—	D	DRAIN		D	DUCT DROP IN DIRECTION OF FLOW
—RD—	RD	REFRIGERANT DISCHARGE		RD	ROUND DUCT UP
—RL—	RL	REFRIGERANT LIQUID		RL	ROUND DUCT DOWN
—RS—	RS	REFRIGERANT SUCTION		RS	SUPPLY DUCT UP
		PIPE DOWN			SUPPLY DUCT DOMN
		PIPE UP			RETURN AIR DUCT/OUTSIDE AIR DUCT UP.
UP		PIPE RISE (OR DN. FOR DROP)			RETURN AIR DUCT/OUTSIDE AR DUCT DOWN
		DIRECTION OF FLOW PIPE			EXHAUST AIR DUCT UP
					EXHAUST AIR DUCT DOWN
	AV	AIR VENT (VALVE)		AV	DUCT TRANSITION
	CHV	CHECK VALVE	⊠	CHV	CEILING DIFFUSER
	CV (2W)	CONTROL VALVE (2-WAY)	⊠	CV (2W)	RETURN REGISTER
	CV (3W)	CONTROL VALVE (3-WAY)	⊠	CV (3W)	EXHAUST REGISTER
	FCD	AUTOMATIC FLOW CONTROL DEVICE		FCD	THERMOSTAT OR TEMPERATURE SENSOR
	SOV	SHUT OFF VALE	T AC-3	SOV	(NUMBER INDICATES EQUIPMENTOR ZONE SERVED)
		GLOBE/BALL/BUTTERFLY VALVE	H		HUMIDISTAT
	BV	COMBINATION BALANCING & SHUT-OFF VALVE	C	BV	CARBON DIOXIDE SENSOR
	FEV	FLOW ELEMENT VENTURI		FEV	CUBIC FEET PER MINUTE
		VALVE ON RISE OR DROP			SYMBOL, SEE EQUIPMENT SCHEDULE
	STR	STRAINER		STR	4-WAY SUPPLY AIR DIFFUSER
	CL	CAPPED LINE		CL	4-WAY RETURN AIR GRILLE
	DN	DOWN OR DROP		DN	SUPPLY AIR DIFFUSER W/ AIR DIRECTION
	UP	RISE OR RISER		UP	SURFACE MOUNT SUPPLY AIR DIFFUSER
	RV	PRESSURE RELIEF VALVE		RV	SURFACE MOUNT RETURN AIR GRILLE
	PG	PRESSURE GAUGE WITH BALL VALVE		PG	SUPPLY AIR SIDEWALL DIFFUSER
	R	ECCENTRIC REDUCER		R	RETURN AIR SIDEWALL GRILLE
	R	CONCENTRIC REDUCER		R	VOLUME CONTROL DAMPER
	FC	FLEXIBLE CONNECTION (PIPE)		FC	SUPPLY/EXHAUST AIR FAN
	PA	PIPE ANCHOR		PA	TERMINAL TAG/ QTY AIR QUANTITY (CFM)
	U	UNION		U	DOOR LOUVER
10X6		DUCTWORK (1ST NUMBER INDICATES WITH SHOW), NET INSIDE DIMENSION			UNDER CUT
	TV	SQUARE ELBOW WITH TURNING VANES		TV	INTAKE/EGRESS
		RADIUS ELBOWN			DUCT HEATER
	MVD	MANUAL VOLUME DAMPER		MVD	WASHROOM VENTILATOR
	MOD	MOTOR OPERATED DAMPER		MOD	
	BDD	BACKDRAFT DAMPER		BDD	
FIRE	FD	FIRE DAMPER		FD	
	SD	DUCT MOUNTED SMOKE DETECTOR		SD	
SMOKE	SFD	AUTOMATIC SMOKE AND FIRE DAMPER		SFD	
	FLEX	FLEXIBLE CONNECTION (DUCTWORK)		FLEX	
	FLEX	FLEXIBLE CONNECTION OR SEISMIC JOINT		FLEX	

AIR DISTRIBUTION SCHEDULE

DWG TAG	SERVICE	MOUNTING	DESCRIPTION	MNF OR EQUAL	MODEL OR EQUAL
SG-A	SUPPLY AIR	SIDE/SURFACE MNT	DEFLECTION REGISTER WITH OPPOSED BLADE DAMPER MAX NC LEVEL 25	HART & COOLEY	A618MS
RG-A	RETURN/EXHAUST AIR	SIDE/SURFACE MNT	RETURN AIR GRILLE WITH OPPOSED BLASE DAMPER, FIXED DEFLECTION, MAX NC LEVEL 25	HART & COOLEY	RH-18X10-W
SG-D	SUPPLY AIR	SIDE/SURFACE MNT	DIRECTIONAL CEILING DIFFUSER, ADJUSTABLE PATTERN WITH FLAT BORDER, OPPOSED BLADE DAMPER	TITUS	250

NOTES:
1) ALL THERMINALS SHALL BE ALUMINUM & FINISHED WHITE, UNLESS NOTED OTHERWISE.
2) ALL SUPPLY DIFFUSERS SHALL BE PROVIDED WITH OPPOSABLE BLADE DAMPERS.

FAN SCHEDULE & DATA

DWG TAG	QTY	MNF. OR EQUAL	MODEL OR EQUAL	SERVICE	CFM	FAN STATIC (IN. W.G)	DUCT CONNECT	ELECTRIC V/PH/HZ	ELECTRIC WATT
TEF-1,2	2	BROAN	QTXE050	TOILET EXH.	50	0.1	4"	120/1/60	100
KEF-1,2	2	BROAN	PM100	KITCHEN EXH.	100	0.35	6"	120/1/60	200

FURNACE UNIT SCHEDULE

TAG NUMBER	LOCATION	SERVICE	TYPE	COOLING TOONAGE	SUPPLY AIR FLOW	COOLING TOTAL (BTUH)	HEATING TOTAL (BTUH)	AFUE	ELECTRICAL		APPROX. WEIGHT (LB)	DIMENSION HXWXD	MODEL		MANUF. OR EQUAL
									MCA	VOLT/PHASE		FURNANCE	FURNACE	COOLING COIL	
FU-1	UNIT-1 BASEMENT	UNIT-1 TOTAL AREA	DUCTED	2.5	1000	30,000	60000	80%	8.7	208-230V, 60/1	90	34"X14"X21.5"	GMES800603AU	CAPF3030A6	GOODMAN

CONDENSING UNIT SCHEDULE

TAG NUMBER	COOLING TOONAGE	COOLING TOTAL CAP (BTUH)	HEATING SENSIBLE CAP (BTUH)	ELECTRICAL		REFRIGERANT	MIN. EFFICIENCY		APPROX. WEIGHT (LB)	DIMENSION HXWXD (INCH)	MANUF. OR EQUAL	MODEL
				MCA	VOLT/PHASE	TYPE	EER	SEER				
CU-1	2.5	30000.0	22958.0	17.0	208-230V, 60/1	R410A	12.0	14%	162.0	3W"X29"X29"	GOODMAN	GSX140301K*

NOTES:
1) CAPACITY IS MEASURED BY MANUFACTURE TESTITNG WHEN PAIRED WITH CORRESPONDING CONDENSING UNIT (SEE CONDENSING UNIT SCHEDULE).
2) COOLING CAPACITY DATA IS BASED ON 95 DEG F OUTDOOR CONDITIONS AND 67 DEG F EADB.

MECHANICAL NOTES, LEGENDS, SCHEDULES

CODES ANALYSIS

THIS PROJECT SHALL COMPLY WITH THE FOLLOWING CODES

2019 CALIFORNIA RESIDENTIAL CODE WHICH INCLUDES:
2019 CALIFORNIA ELECTRICAL CODE,
2019 CALIFORNIA GREEN BUILDING CODE,
2019 CALIFORNIA MECHANICAL CODE,
2019 CALIFORNIA PLUMBING CODE,
2019 CALIFORNIA BUILDING ENERGY EFFICIENCY STANDARDS,
2019 CALIFORNIA BUILDING CODE,
2019 CALIFORNIA FIRE CODE.