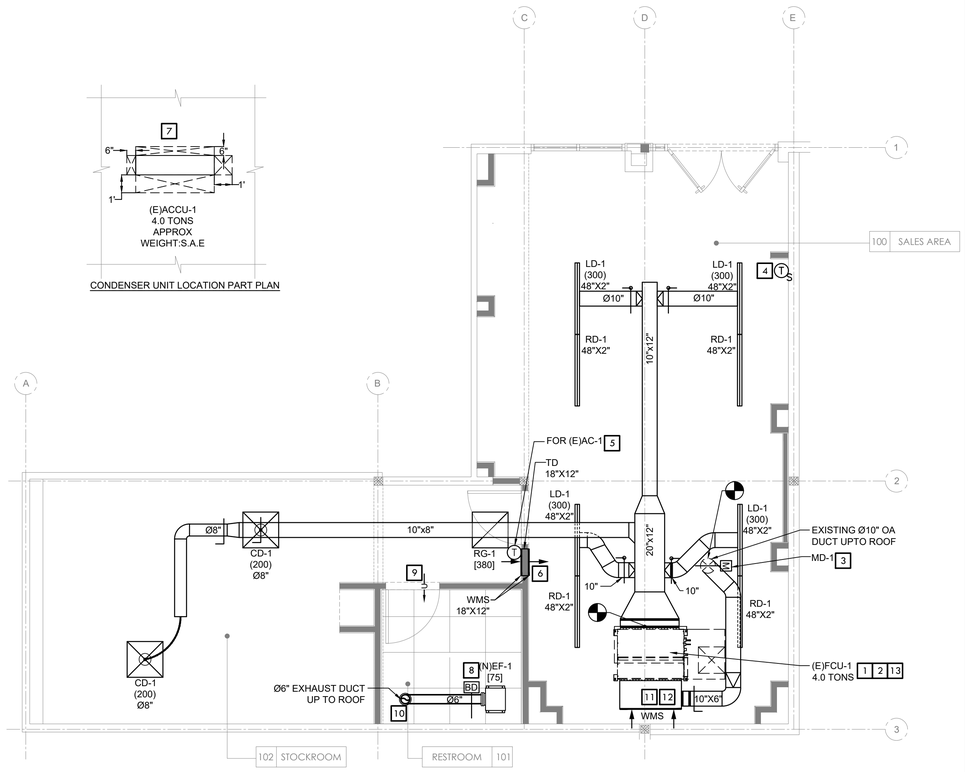


1 MECHANICAL FLOOR PLAN
1/4" = 1'-0"

GENERAL NOTES:

1. ALL AIR DISTRIBUTION DEVICES SHALL BE COORDINATED WITH THE ARCHITECTURAL RCP & LIGHTING LAYOUT.
2. COORDINATE ALL WORK ON OTHER FLOORS AND IN OTHER TENANT SPACES WITH OWNERS REP. SO THAT WORK DOES NOT INTERFERE WITH OTHER TENANTS.
3. COORDINATE THE EXACT LOCATION OF ALL THERMOSTATS WITH FINAL FURNITURE LAYOUT, EQUIPMENT LAYOUT, ARCH AND OWNERS REPRESENTATIVE.
4. PROVIDE ALL MANUFACTURER AND NEC REQUIRED CLEARANCE FOR ALL EQUIPMENT.
5. ENSURE ALL NEW BUILDING VENTS ARE FITTED WITH ANIMAL SCREENS EXCEPT OTHERWISE NOTED.
6. CONTRACTOR SHALL BALANCE EACH DEVICE WITH THE CFM SHOWN ON PLAN.
7. NEW DUCTWORK SHOWN ON PLAN ARE SCHEMATIC ONLY. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR PIPING AND DUCTWORK ROUTING. OFFSET AND RUN PIPING, DUCTWORK INSIDE THE STRUCTURE IF REQUIRED. PROVIDE ANY EXTRA PIPING, DUCTWORK, FITTINGS, INSULATIONS AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATION.
8. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
9. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.
10. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
11. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.
12. MOUNT DUCTWORK AS HIGH AS POSSIBLE.
13. TEST AND BALANCE AIR SYSTEMS. PROVIDE REPORT TO G.C AND OWNER.
14. NEW DUCTWORK IN CONCEALED AREAS MAY BE RECTANGULAR WITH EQUIVALENT CROSS SECTIONAL FLOW AREA.
15. PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/BARRIERS/ROOF PENETRATIONS. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR FIRE RATINGS OF THE WALLS.
16. PROVIDE CABLE OPERATED DAMPER IN INACCESSIBLE CEILINGS.
17. COORDINATE FINAL LOCATION OF ALL HAVC EQUIPMENT WITH STRUCTURAL ENGINEER/ OWNER/ ARCHITECT.
18. PROVIDE ACCESS DOOR FOR HVAC UNITS & FANS)AS PER MANUFACTURER RECOMMENDATIONS.
19. R-8 INSULATION (INTERNAL FOR EXPOSED DUCTS AND EXTERNAL FOR CONCEALED DUCTS) FOR SUPPLY & RETURN AIR DUCTS. PROVIDE ACOUSTIC INSULATION ON MAIN SUPPLY AND RETURN DUCTS UP TO 10 FT.FROM HVAC UNIT.

KEYED NOTES:

1 EXISTING SPLIT DX FAN COIL UNIT ASSOCIATED ACCESSORIES/SENSORS TO REMAIN. ROTATE THE EXISTING UNIT AS SHOWN ON PLAN, CLEAN AND REFURBISH TO "LIKE-NEW" CONDITION. REPAIR/REPLACE ANY ACCESSORIES AS REQUIRED TO PROVIDE A FULLY FUNCTIONING UNIT. VERIFY IN FIELD PRIOR TO BID ENSURE UNIT IS BALANCED TO 1600CFM AND BALANCE OUTSIDE AIR DAMPER TO 150 CFM. CONTRACTOR TO ENSURE THERE IS AMPLE SPACE AVAILABLE FOR UNIT MAINTENANCE AS PER MANUFACTURERS RECOMMENDATIONS. NOTIFY ARCHITECT/ENGINEER FOR ANY DISCREPANCIES PRIOR TO BID AND START OF WORK.

2 CONTRACTOR TO ENSURE THE DRAIN PIPING SHALL BE CONVEYED TO AN APPROVED PLACE OF DISPOSAL AS PER LOCAL BUILDING REGULATIONS. SUCH PIPING SHALL MAINTAIN A MINIMUM 1% HORIZONTAL SLOPE IN DIRECTION OF DISCHARGE. COORDINATE WITH PLUMBING DRAWINGS FOR PREFERRED DRAIN LOCATION, IF NOT PROVIDE NEW CONNECTION. PROVIDE SECONDARY CONDENSATE DRAIN PAN FOR AIR HANDLERS AS/IF REQUIRED.

KEYED NOTES:

3 CONTRACTOR TO VERIFY THE CONDITION OF ROOF MOUNTED OA HUB & ACCESSORIES IF FOUND DAMAGE REPLACE IN WITH SAME KIND.PROVIDE THE MOTORIZED THE DAMPER MD-1 ADN INTERLOCK IT WITH (E)FCU-1 ADJUST IT TO OUTSIDE AIR OF 150CFM.

4 PROVIDE NEW TEMPERATURE SENSOR ON THE WALL 4'-6" ABOVE FINISH FLOOR AS SHOWN ON PLAN. COORDINATE WITH EXISTING UNIT MANUFACTURER FOR COMPATIBLE CONTROLS AS REQUIRED.

5 EXISTING THERMOSTAT TO BE RE-USED/RELOCATED. CONTRACTOR TO VERIFY IN FIELD, REPLACE IN KINDS IF DAMAGED. COORDINATE WITH CLIENT/ARCHITECT FOR FINAL DESIRED LOCATION AND HEIGHT.

6 PROVIDE TRANSFER AIR DUCT AS SHOWN AND COVER BOTH THE END WITH W.M.S OF SAME SIZE AND INSTALL IT BELOW THE CEILING. COORDINATE FINAL COLOR AND FINISH WITH CLIENT/ARCHITECT PRIOR TO BID/PLACING ORDERS.

7 EXISTING HEAT PUMP TYPE CONDENSING UNIT (E)ACCU-1 ON EXISTING LOCATION AND ASSOCIATED ACCESSORIES TO REMAIN, CLEAN AND REFURBISH TO "LIKE-NEW" CONDITION. REPAIR/REPLACE ANY ACCESSORIES AS REQUIRED TO PROVIDE A FULLY FUNCTIONING UNIT. VERIFY EXACT LOCATION & CONFIGURATION IN FIELD PRIOR TO BID, ENSURE THE RELATED REFRIGERANT PIPES ALONG WITH ITS INSULATION TO THE (E)ACCU-1 ARE PROPERLY DONE AND CAN BE RE-USED. PATCH AND SEAL THE SLEEVES/OPENING AS REQUIRED. NOTIFY ARCHITECT/ENGINEER FOR ANY DISCREPANCIES PRIOR TO BID AND START OF WORK.

8 PROVIDE NEW CEILING MOUNTED EXHAUST FAN (N)EF-1 WITH BACKDRAFT DAMPER & ROUTE THE DUCT UP TO ROOF. COORDINATE EXACT LOCATION, INTERLOCK THE FAN WITH LIGHT SWITCH.

9 PROVIDE 1" DOOR UNDERCUT FOR AIR TRANSFER.

10 ENSURE TERMINATION OF THE EXHAUST DUCT AT ROOF PROVIDED WITH GOOSENECK AND INSECT SCREEN AND SHALL BE 10 FEET (3048 MM) FROM THE PROPERTY LINES; 3 FEET (914 MM) FROM OPERABLE OPENINGS INTO BUILDINGS; 10 FEET (3048 MM) FROM MECHANICAL AIR INTAKES.

11 EXTEND THE FULL SIZE RETURN AIR PLENUM AND PROVIDE FULL SIZE WIRE MESH SCREEN.

12 ADJUST THE VOLUME CONTROL DAMPER IN THE RETURN AIR PLENUM TO THE CFM MENTIONED IN THE AIR BALANCE TABLE.

13 EXTEND THE FULL SIZE OF SUPPLY AIR DUCT AND ACOUSTICALLY LINE THE FIRST 10 FEET, PROVIDE THE REQUIRED SUPPORT AND ACCESSORIES.

2 MECHANICAL GENERAL NOTES AND KEY NOTES
NTS

LEGEND

	CEILING SUPPLY DIFFUSER		POINT OF CONNECTION
	CEILING RETURN AIR GRILLE		POINT OF DISCONNECTION
	CEILING EXHAUST GRILLE		FLEXIBLE CONNECTION
	SIDE-WALL OR DUCT MOUNTED REGISTER		CORD OPERATED DAMER
	SLOT DIFFUSER		
	MANUAL VOLUME DAMPER		
	FIRE DAMPER,,FIRE SMOKE DAMPER		
T	THERMOSTAT		
H	HUMIDSTAT		
CO	CO2 MONITOR		
	MOTORIZED DAMPER		
	EXISTING WORK		
	NEW WORK		
	DOOR UNDERCUT		
	PRESSURE REGULATOR VALVE 5 PSI TO 7"WATER GAUGE		
TS	TEMPERATURE SENSOR		
	BACKDRAFT DAMPER		

ABBREVIATIONS

A/C	ABOVE CEILING	ID	INSIDE DIMENSION	EA	EACH	RA	RETURN AIR
AD	ACCESS DOOR	IN	INCHES	EAT	ENTERING AIR TEMPERATURE	RAD	RADIUS
ADJ	ADJUSTABLE			ECC	ECCENTRIC	RG	RETURN AIR GRILLE
AFF	ABOVE FINISHED FLOOR			EF	EXHAUST FAN	RED	REDUCER
AUTO	AUTOMATIC	KW	KILOWATTS	EOD	EMERGENCY OVERFLOW DRAIN	RL	REFRIGERANT LIQUID
AC	AIR CONDITIONING			ER	EXHAUST REGISTER	RS	REFRIGERANT SUCTION / RETURN SLOTS
AHU	AIR HANDLING UNIT			ESP	EXTERNAL STATIC PRESSURE	RTU	ROOFTOP UNIT
ACCU	AIR COOLED CONDENSING UNIT	LAT	LEAVING AIR TEMPERATURE	EWT	ENTERING WATER TEMPERATURE	RR	RETURN REGISTER
		LB	POUNDS	EXH	EXHAUST		
BAL	BALANCING	LG	LINEAR GRILLE	EFF	EFFICIENCY	SP	STATIC PRESSURE
BDD	BACKDRAFT DAMPER	LRG	LINEAR RETURN GRILLE	EG	EXHAUST AIR GRILLE	SPS	STATIC PRESSURE SENSOR
B/F	BELOW FLOOR	LWR	LOOP WATER RETURN			SA	SUPPLY AIR
B/G	BELOW GRADE	LWS	LOOP WATER SUPPLY	F	FAHRENHEIT	SAN	SANITARY
BFLY	BUTTERFLY			FCO	FLOOR CLEAN OUT	SD	SMOKE DAMPER / SLOT DIFFUSER
BHP	BRAKE HORSEPOWER			FCU	FAN COIL UNIT	SEN	SENSIBLE
BCO	BASE CLEANOUT			FSD	FIRE/SMOKE DAMPER	SQ	SQUARE
		MIN	MINIMUM	FD	FIRE DAMPER OR FLOOR DRAIN	SR	SUPPLY REGISTER
CFM	CUBIC FEET PER MINUTE	MAX	MAXIMUM	FL DR	FLOOR DRAIN (only)	ST	STORM
CBCR	CURVED BLADE CEILING REGISTER	MD	MANUAL DAMPER	FLR	FLOOR	SS	SPLIT SYSTEM
CSD	CEILING SUPPLY DIFFUSER	MOD	MOTOR OPERATED DAMPER	FOB	FLAT ON BOTTOM	SG	SUPPLY AIR GRILLE
CU	CONDENSING UNIT	MFR	MANUFACTURER	FOR	FUEL OIL RETURN		
CW	COLD WATER (DOMESTIC)			FOS	FUEL OIL SUPPLY	TEMP	TEMPERATURE
CHWS	CHILLED WATER SUPPLY	NC	NORMALLY CLOSED	FOT	FLAT ON TOP	TG	TRANSFER GRILLE
CHWR	CHILLED WATER RETURN	NG	NATURAL GAS	FPM	FEET PER MINUTE	TYP	TYPICAL
CWS	CONDENSER WATER SUPPLY	NFWH	NON-FREEZE WALL HYDRANT	FPS	FEET PER SECOND	TD	TRANSFER DUCT
CWR	CONDENSER WATER RETURN	NO	NORMALLY OPEN	FT	FEET		
CON	CONCENTRIC	NOM	NOMINAL			UON	UNLESS OTHERWISE NOTED
CO	CLEANOUT			G	GATE		
COND	CONDENSATE	OA	OUTSIDE AIR	GA	GAUGE	V	VENT
		OD	OUTSIDE DIMENSION	GPM	GALLONS PER MINUTE	VA	VALVE
db	DRY BULB	OBD	OPPOSED BLADE DAMPER	GL	GLOBE	VTR	VENT THRU ROOF
DN	DOWN			GCO	GRADE CLEANOUT	VAV	VARIABLE AIR VOLUME
DR	DRAIN	PIU	POWERED INDUCTION UNIT				
do	DITTO	PSI	POUNDS PER SQUARE INCH	HD	HUB DRAIN	WB	WET BULB
dB	DECIBELS			HP	HORSEPOWER	WC	WATER COLUMN
DWG	DRAWING			HTG	HEATING	WHA	WATER HAMMER ARRESTOR
				HW	HOT WATER (DOMESTIC)	WT	WEIGHT
				HWR	HOT WATER RETURN	W	WASTE
				HWRR	HOT WATER REVERSE RETURN	WMS	WIRE MESH SCREEN
				HWS	HOT WATER SUPPLY		
				Hz	HERTZ		

3 MECHANICAL LEGENDS AND ABBREVIATIONS
NTS

INDOOR DX SPLIT UNIT SCHEDULE — BASIS OF DESIGN: MITSUBISHI

UNIT TAG	LOCATION	ODU	AREA SERVED	TYPE	CAP. (TON)	COOLING MBH	HEATING MBH @47°F	TOTAL CFM (MAX.)	MAX. ESP. (IN. WG)	OUTSIDE AIR (CFM)	MAX. SOUND PRESS.(DBA)	ELECTRICAL DATA (V/Hz/Ph)	ELECTRICAL DATA MCA	ELECTRICAL DATA MOP	DIMENTIONS (HXWXL) (IN.) UNIT	WEIGHT (LBS.)	MANUFACTURER	MODEL NO.
(E)FCU-1	SEEPLAN	(E)ACCU-1	SEE PLAN	S.A.E	4.0 (V.I.F)	(S.A.E)	(S.A.E)	(S.A.E)	(S.A.E)	150	(S.A.E)	208-230/60/1 (V.I.F)	4.16 (V.I.F)	15 (V.I.F)	(S.A.E)	(S.A.E)	(S.A.E)	PEFY-P48NMHU-E2 (V.I.F)
NOTE: S.A.E: SAME AS EXISTING , V.I.F:VERIFY IN FIELD																		
1) EXISTING SYSTEM WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.																		
2) CONTRACTOR TO FIELD VERIFY IF FCU IS WORKING AT THEIR 100% RATED CAPACITIES/LOADS. INFORM TO DESIGN ENGINEER IF ANY DISCREPANCIES ARE FOUND IN PERFORMANCE PRIOR TO CONSTRUCTION.																		
3) CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF UNITS ON SITE.																		
4) IF REQUIRED, PROVIDE NEW THERMOSTAT AND TEMPERATURE SENSORS COMPATIBLE WITH EXISTING FCU. COORDINATE FINAL LOCATIONS OF T-STAT AND T-SENSORS WITH ARCHITECT/OWNER.																		
5) CONTRACTOR TO BALANCE OUTSIDE AIR & RETURN AIR DAMPERS ON EXISTING FCU TO MATCH VALUES MENTIONED IN ABOVE TABLE.																		
6) REPLACE AIR FILTERS WITH NEW FILTERS IF REQUIRED, PROVIDE MINIMUM MERV 13 FILTERS.																		

OUTDOOR HEAT PUMP UNIT SCHEDULE — BASIS OF DESIGN: MITSUBISHI

UNIT TAG	INDOOR UNITS SERVED	CAP.TR	TYPE	UNIT DIMENSIONS IN.(HXWXD)	WEIGHT (LBS)	ELECTRICAL (V/Hz/Ph)	ELECTRICAL MCA	ELECTRICAL MOP	SOUND LEVEL (DBA)	EER2	HSPF2	MANUFACTURER	MODEL NO.
(E)ACCU-1	(E)FCU-1	4.0 (V.I.F)	S.A.E	S.A.E	S.A.E	208-230/60/1 (V.I.F)	29 (V.I.F)	40 (V.I.F)	S.A.E	S.A.E	S.A.E	S.A.E	MXZ-SM48NAM-U1 (V.I.F)
NOTES: S.A.E: SAME AS EXISTING , V.I.F:VERIFY IN FIELD													
1) EXISTING SYSTEM WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.													
2) PROVIDE COMPRESSOR CYCLE PROTECTOR.													
3) CONTRACTOR TO FIELD VERIFY IF ACCU IS WORKING AT THEIR 100% RATED CAPACITIES/LOADS. CONTRACTOR TO PROVIDE ALTERNATE PRICING IF REFRIGERANT CHARGE IS REQUJIRED FOR THE EXISTING SYSTEM, INFORM TO DESIGN ENGINEER IF ANY DISCREPANCIES ARE FOUND IN PERFORMANCE PRIOR TO CONSTRUCTION.													
4) CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF UNIT ON SITE.													
5) CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF ACCU ON THE ROOF.													

VENTILATION CALCULATION AS PER CALIFORNIA ENERGY CODE 2022 - TABLE 120.1-A & B

SL NO	ROOM NAME	AREA	OCCUPANCY BASED ON ARCH	FINAL PEOPLE NO	OUTDOOR AIR FLOW RATE (CFM/SQ.FT)	REQUIRED OA (CFM)	PROVIDED OA (CFM)	EXHAUST CFM RATE AS PER CODE	PROVIDED EXHAUST AIR (CFM)	REFERENCE
1	SALES AREA	498	10	10	0.25	125	130	0	0	RETAIL-SALES
2	STOCKROOM	315	2	2	0.15	47	20	0	0	WAREHOUSES
3	RESTROOM	53	0	0	0	0	0	70	75	PUBLIC-TOILET
-	TOTAL	866	-	12	-	-	150	-	75	-

4 MECHANICAL SCHEDULES
NTS

AIR BALANCE SCHEDULE

UNIT	AREA SERVED	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
(E)FCU-1	SEE PLAN	1600	150	1450	-
(N)EF-1	SEE PLAN	-	-	-	75
TOTAL:		1600	150	1450	75
BUILDING PRESSURE:			75		POSITIVE

AIR TERMINAL DEVICE SCHEDULE

TAG	MANUFACTURER	MODEL	TYPE	CFM RANGE	NECK SIZE(IN.)	LENGTH	FRAME SIZE
CD-1	TITUS	TMS	SQUARE CEILING SUPPLY DIFFUSER	0-100	6"		24"X24"
				101-200	8"		24"X24"
				201-400	10"		24"X24"
LD-1		ML-39	SUPPLY CEILING SLOT DIFFUSER	75 CFM PER FEET	10" Ø	48"	-
RG-1		350RL	RETURN AIR GRILLE CEILING MOUNTED	0-130	6"X6"		24"X24"
				130-250	8"X8"		24"X24"
TG			TRANSFER GRILLE	270-400	10"X6"		10"X6"
RD-1		MLR-39	PLENUM SLOT RETURN DIFFUSER-2-SLOT - 1" SLOT	75 CFM PER FEET	10"Ø	48"	-
NOTES:							
1. ALL DIFFUSERS : CONTRACTOR SHALL COORDINATE WITH LATEST ARCHITECTURAL REFLECTED CEILING PLANS TO ENSURE PROPER AIR DEVICE BORDER SELECTION.							
2. REFER ARCHITECTURAL DRAWINGS FOR CEILING TYPE.							
3. COORDINATE COLOR/FINISH WITH ARCHITECT.							
4. NOISE CRITERIA: <25 dBA							
5. PROVIDE VOLUME CONTROL DAMPER AS ACCESSARY FOR ALL AIR TERMINAL FOR AIR BALANCING.PROVIDE CABLE OPERATED DAMPERS IN INACCESIBLE CEILINGS.							

MECHANICAL FAN SCHEDULE

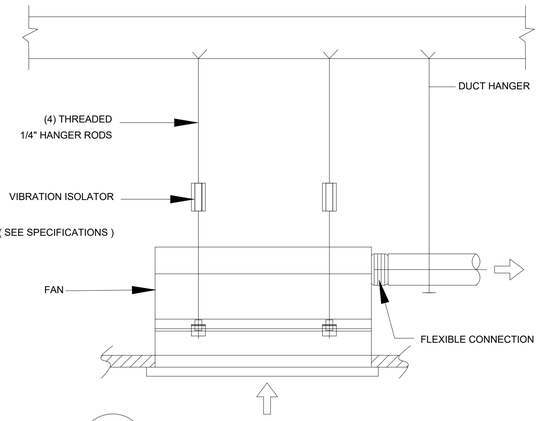
TAG	FLOW RATE	STATIC PRESSURE EXTERNAL	ELECTRICAL DATA FAN SPEED	MOTOR SIZE			V/HZ/PH	WEIGHT	INTERLOCK	BASIS OF DESIGN	
	CFM	IN W.G.	RPM	FLA	MCA	MOP		LBS		MANUFACTURER	MODEL
(N)EF-1	75	0.6	950	1.2	1.4	15	115/60/1	20	LIGHT SWITCH	GREENHECK	SP-B110
NOTES:											
1. PROVIDE FACTORY MOUNTED AND INSTALLED DISCONNECT.											
2. COORDINATE EXACT POWER REQUIREMENT WITH ELECTRICAL CONTRACTOR.											
3. ALL DIRECT DRIVE FANS TO HAVE ECM MOTORS.											
4. ALL EQUIPMENT NORMAL POWER WIRING BY ELECTRICAL CONTRACTOR.											

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TITLE:
MECHANICAL PLAN

SHEET NUMBER:
M-100



1 M-200 N.T.S — CEILING FAN HANGING SUPPORT DETAIL

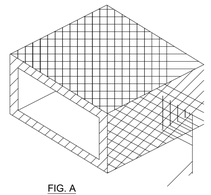


FIG. A

NOTES:
DUCTS TO BE ACOUSTICALLY LINED SHALL BE DESIGNATED BY THE SYMBOL IN FIG. "C" TO THE EXTENT OF LINING. THICKNESS SHALL BE AS SPECIFIED.
DUCTS LINED WITH ACOUSTICAL MATERIAL SHOULD BE FASTENED WITH CLIPS, ADHESIVE, OR PINS

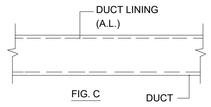


FIG. C

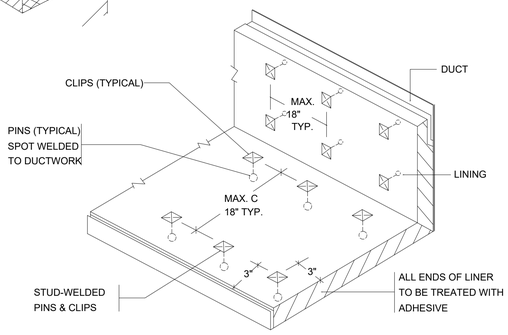
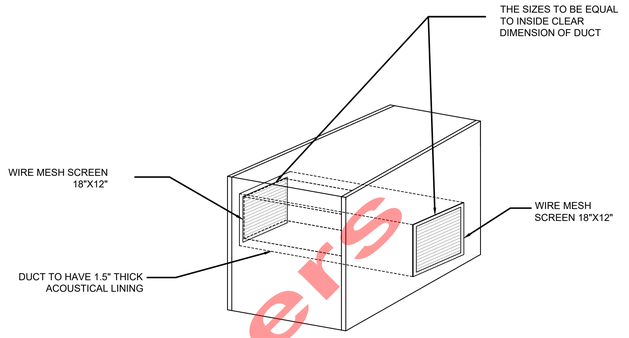
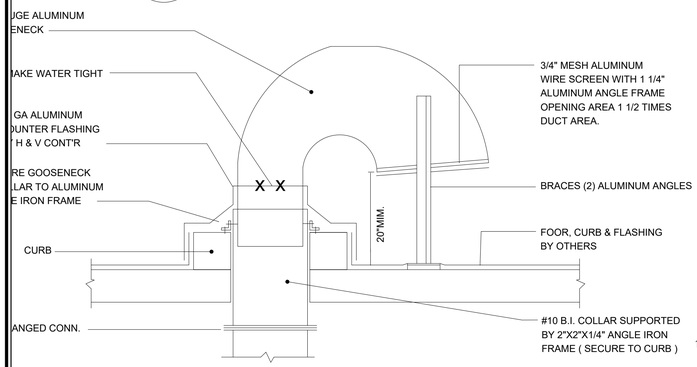


FIG. B

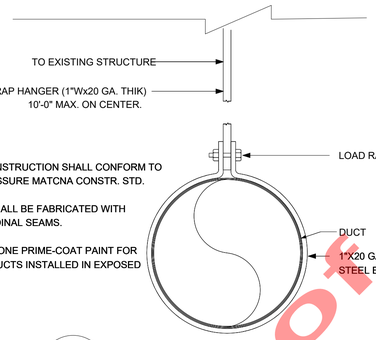
2 M-200 N.T.S — ACOUSTICAL TREATMENT DUCT LINING



3 M-200 N.T.S — TRANSFER AIR DUCT DETAILS

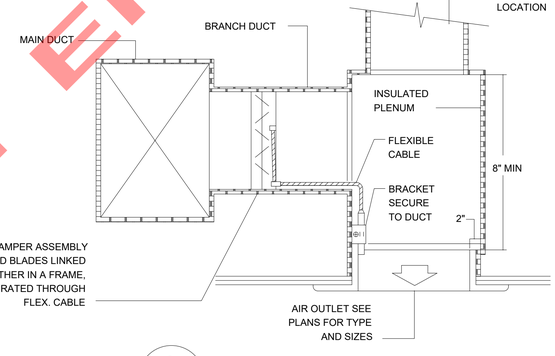


4 M-200 N.T.S — TYPICAL DETAIL OF ROOF GOOSENECK

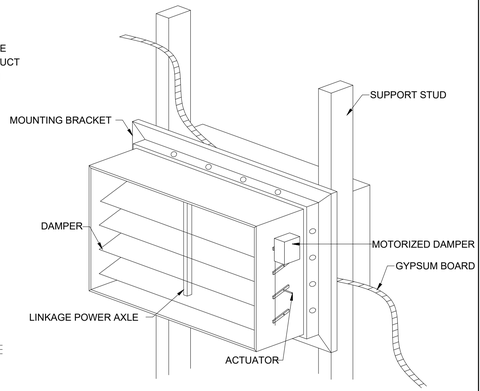


NOTES :
1. DUCT CONSTRUCTION SHALL CONFORM TO LOW PRESSURE MATCNA CONSTR. STD.
2. DUCTS SHALL BE FABRICATED WITH LONGITUDINAL SEAMS.
3. PROVIDE ONE PRIME-COAT PAINT FOR ROUND DUCTS INSTALLED IN EXPOSED AREAS.

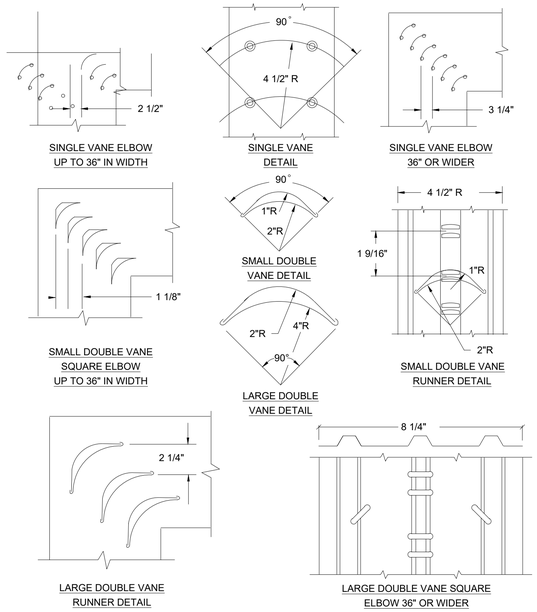
5 M-200 N.T.S — ROUND DUCT HANGING DETAILS



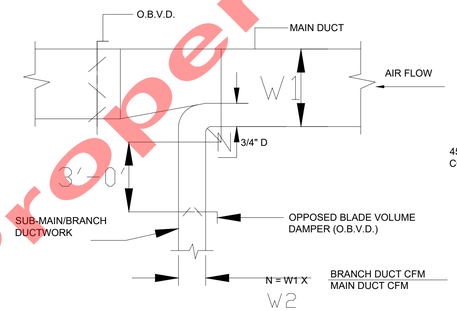
6 M-200 N.T.S — STANDARD LINEAR DIFFUSER DETAIL



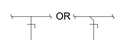
7 M-200 N.T.S — MOTORIZED DAMPER DETAIL

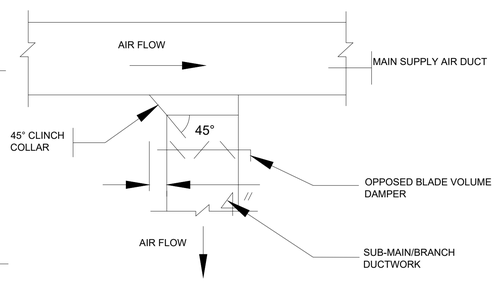


8 M-200 N.T.S — LOW VELOCITY DUCTWORK ELBOWS

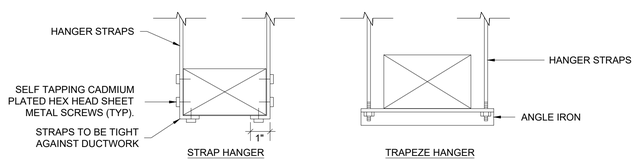


NOTE:
FURNISH THIS TYPE CONNECTION WHEN SINGLE LINE DUCTWORK IS INDICATED AS THIS





9 M-200 N.T.S — SUPPLY AIR DUCTWORK SUB-MAIN/BRANCH DUCT CONNECTION



NOTE:
NO POP RIVETS ALLOWED, USE SELF-TAPPING SHEETMETAL SCREWS ONLY.

HANGER SIZES*

MAX. SIDE	HANGER	HORIZONTAL SUPPORT ANGLE	MAXIMUM SPACING
30"	1"x18" GAUGE STRAP	NONE REQUIRED	10'-0"
36"	1/4" ROD	1-1/2"x1-1/2"x1/8"	8'-0"
48"	1/4" ROD	2"x2"x1/8"	8'-0"
60"	5/16" ROD	2"x2"x1/8"	8'-0"
84"	3/8" ROD	2"x2"x1/8"	8'-0"

* FOR RECTANGULAR DUCTS

10 M-200 N.T.S — DUCT HANGING DETAILS

Property of NY Engineers

L'OCCITANE
EN PROVENCE

TITLE:
MECHANICAL DETAILS

SHEET NUMBER:
M-200

MECHANICAL SPECIFICATION

GENERAL REQUIREMENTS

A. GENERAL

1. SPECIFICATIONS ARE APPLICABLE TO ALL CONTRACTORS AND/OR SUBCONTRACTORS FOR ALL MECHANICAL SYSTEMS IN DIVISION 01, 20, 22 AND 23.

2. CONTRACTOR IS ALSO REFERRED TO THE ARCHITECTURAL, STRUCTURAL, ELECTRICAL AND ALL OTHER DRAWINGS AND SPECIFICATIONS PERTINENT TO THIS PROJECT AND FULLY COORDINATE WITH ALL OTHER TRADES, OWNER AND ARCHITECT REQUIREMENTS. ALL OF THE ABOVE MENTIONED DRAWINGS AND SPECIFICATIONS ARE CONSIDERED A PART OF THE CONTRACT DOCUMENTS.

3. CONFORM TO ALL INSTRUCTIONS TO BIDDERS, GENERAL AND SPECIAL CONDITIONS OF CONTRACT AS SPECIFIED BY ARCHITECT AND/OR OWNER.

4. REFER TO “ALTERNATE PROPOSALS” FOR POSSIBLE CHANGES AFFECTING THE EXTENT OF THIS SECTION OF WORK.

5. BEFORE SUBMITTING A BID, EACH CONTRACTOR IS REQUESTED TO VISIT THE JOB SITE TO FAMILIARIZE THEMSELVES WITH CONSTRUCTION CONDITION, CHECK FACILITIES AND CONDITIONS AND MAKE ALL NECESSARY OBSERVATIONS AND MEASUREMENTS. NOTE CONDITIONS UNDER WHICH WORK IS TO BE PERFORMED AND TAKE ALL ITEMS INTO CONSIDERATION IN BID. NO CONSIDERATION WILL BE GIVEN FOR HIS FAILURE TO DO SO.

6. SYSTEMS ARE TO BE COMPLETE AND WORKABLE IN ALL RESPECTS, PLACED IN OPERATION AND PROPERLY ADJUSTED.

7. EACH CONTRACTOR SHALL PROVIDE FOR HIS OWN CLEAN-UP, REMOVAL AND LEGAL DISPOSAL OF ALL RUBBISH DAILY.

8. EACH CONTRACTOR SHALL PROTECT HIS WORK, HIS EXISTING AND ADJACENT PROPERTY AGAINST WEATHER.

9. EACH CONTRACTOR SHALL PROTECT HIS WORK, MATERIALS, APPARATUS AND FIXTURES FROM DAMAGE. ANY WORK DAMAGED BY FAILURE TO PROVIDE PROTECTION REQUIRED, SHALL BE REMOVED AND REPLACED WITH NEW MATERIAL AT THE CONTRACTOR'S EXPENSE.

10. EACH CONTRACTOR MUST CONFIRM ALL UTILITY COMPANY REQUIREMENTS AND CONNECTION POINTS IN FIELD, PRIOR TO STARTING WORK. EACH CONTRACTOR SHALL INCLUDE COST OF UTILITY COMPANIES WORK IN THEIR BID.

11. EACH CONTRACTOR MUST CONFIRM SIZE, LOCATION AND MATERIALS AT POINT OF TIE IN CONNECTIONS IN THE FIELD PRIOR TO ROUGH-IN OF NEW WORK.

12. ARRANGE FOR AND OBTAIN OWNER'S AND INSURANCE REPRESENTATIVE'S PERMISSION FOR ANY SERVICE SHUTDOWNS.

13. EACH CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, SEQUENCES OF CONSTRUCTION AND THE SAFETY OF WORKMEN.

14. NO PIPING, DUCTWORK, WIRING, ETC., SHALL BE INSTALLED OR ROUTED ABOVE OR BELOW ELECTRICAL PANELS AND EQUIPMENT, OR STAIRWAYS UNLESS THESE ITEMS SERVE THESE AREAS ONLY.

15. EACH CONTRACTOR SHALL INCLUDE MODIFYING EXISTING CONDITIONS TO COMPLETE THE PROJECT. DURING CONSTRUCTION THE CONTRACTORS MAY UNCOVER AN EXISTING CONDITION THAT WILL HAVE TO BE MODIFIED. ANY SUCH WORK WHICH COMES UNDER THE JURISDICTION OF THIS CONTRACTOR SHALL BE DONE BY THIS CONTRACTOR WITHOUT EXTRA COST TO THE OWNER AND PROJECT.

16. WORK RELATED TO THE EXISTING BUILDING SHALL BE COORDINATED TO MINIMIZE INTERFERENCE OR INTERRUPTION OF NORMAL BUILDING USE BY THE OWNER. REFER TO ARCHITECTURAL PLANS FOR PHASING REQUIREMENTS.

B. WORK COORDINATION AND SCOPE

1. EACH CONTRACTOR UNDER THIS DIVISION SHALL FAMILIARIZE HIMSELF WITH THE WORK TO BE DONE UNDER OTHER DIVISIONS OF THIS SPECIFICATION AND THEIR RELATED DRAWINGS AND SHALL SO COORDINATE AND SCHEDULE HIS WORK AS NOT TO CAUSE DELAYS OR INTERFERENCE WITH THE WORK OF OTHERS. SUCH COORDINATION AND SCHEDULING SHALL ACCOMPLISH THE INSTALLATION OF MECHANICAL EQUIPMENT WITH A MINIMUM OF CUTTING THROUGH MASONRY AND OTHER ADJUSTMENTS.

2. WORK INCLUDED UNDER THIS DIVISION SHALL CONSIST OF FURNISHING ALL MATERIALS, SUPPLIES, EQUIPMENT, TOOLS, TRANSPORTATION AND FACILITIES AND PERFORMING ALL LABOR AND SERVICES NECESSARY FOR THE COMPLETE INSTALLATION OF THE MECHANICAL SYSTEMS OF PLUMBING, FIRE PROTECTION, HEATING, VENTILATING, AIR CONDITIONING, AND SPECIALTY SYSTEMS.

3. THE CONTRACTOR UNDER THIS DIVISION SHALL REPORT DISCREPANCIES IN THE WORK OF OTHERS WHICH AFFECT HIS WORK. ANY CHANGES MADE NECESSARY BY FAILURE OR NEGLECT TO REPORT SUCH DISCREPANCIES SHALL BE MADE BY AND AT THE EXPENSE OF THE CONTRACTOR OF THIS DIVISION. OBTAIN WRITTEN INSTRUCTIONS FOR CHANGES NECESSARY TO ACCOMMODATE WORK OF OTHERS.

4. THE CONTRACTOR UNDER THIS DIVISION SHALL BE RESPONSIBLE FOR PROPER SIZE AND LOCATION OF ANCHORS, CHASES, RECESSES, OPENING, ETC., REQUIRED FOR THE PROPER INSTALLATION OF HIS WORK.

C. CODES, PERMITS, STANDARDS AND REGULATIONS

1. CONTRACTORS SHALL INSTALL WORK IN FULL ACCORDANCE WITH RULES AND REGULATIONS OF ALL APPLICABLE CODES (LOCAL,CITY, COUNTY, STATE, NATIONAL CODES, NFPA, OSHA, ETC.), GOVERNMENT REGULATIONS, UTILITY COMPANY REQUIREMENTS, AND APPLICABLE STANDARDS HAVING JURISDICTION OVER PREMISES. THIS SHALL INCLUDE SAFETY REQUIREMENTS OF THE STATE DEPARTMENT. DO NOT CONSTRUE THIS AS RELIEVING CONTRACTOR FROM COMPLIANCE WITH ANY REQUIREMENTS OF SPECIFICATIONS WHICH ARE IN EXCESS OF CODE REQUIREMENTS AND NOT IN CONFLICT THEREWITH.

1. SAN FRANCISCO BUILDING CODE 2022 WITH AMENDMENTS (CBC 2022).
2. CALIFORNIA ENERGY CODE 2022 WITH AMENDMENTS (CEC 2022).
3. SAN FRANCISCO PLUMBING CODE 2022 WITH AMENDMENTS (CPC 2022).
4. SAN FRANCISCO MECHANICAL CODE 2022 WITH AMENDMENTS (CMC 2022).
5. SAN FRANCISCO ELECTRICAL CODE 2022 WITH AMENDMENTS (CA ELC, 2022).
6. SAN FRANCISCO FIRE CODE 2022 WITH AMENDMENTS (CFC 2022).

2. CONTRACTORS SHALL SECURE AND PAY FOR ALL FEES, PERMITS, AND CERTIFICATES OF INSPECTION INCIDENTAL TO THIS WORK REQUIRED BY FOREGOING AUTHORITIES. ARRANGE FOR ALL REQUIRED INSPECTIONS AND APPROVALS.

3. CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENTS TO ALL PUBLIC UTILITIES FOR WORK PERFORMED BY THEM IN CONNECTION WITH PROVISION OF SERVICE CONNECTIONS REQUIRED UNDER THIS DIVISION OF SPECIFICATIONS.

4. DELIVER ALL PERMITS AND CERTIFICATES TO ARCHITECT IN DUPLICATE.

D. DESIGN DRAWINGS

1. THE DESIGN DRAWINGS, AS SUBMITTED, ARE DIAGRAMMATIC AND ARE NOT INTENDED TO SHOW EXACT LOCATION OF EQUIPMENTAND PIPING UNLESS DIMENSIONS ARE GIVEN. PIPING ARE TO BE INSTALLED ALONG THE GENERAL PLANS SHOWN ON THE DRAWINGS WHILE CONFORMING TO ACTUAL BUILDING CONDITIONS. EACH CONTRACTOR SHALL CONFIRM ALL DIMENSIONS BY FIELD MEASUREMENT.

2. BEFORE ENTERING INTO A CONTRACT, THE SUCCESSFUL BIDDER MAY BE REQUIRED TO SUBMIT SATISFACTORY EVIDENCE TO SHOW THAT THE MANUFACTURER OF ALL PARTS OF THE EQUIPMENT OFFERED HAVE BEEN REGULARLY ENGAGED IN THE MANUFACTURE OF SUCH EQUIPMENT FOR THREE (3) YEARS AND HAVE NOT LESS THAN THREE (3) INSTALLATIONS OF A SIMILAR TYPE WHICH HAVE BEEN IN SUCCESSFUL OPERATION UNDER CONDITIONS SIMILAR TO THOSE SPECIFIED FOR NOT LESS THAN TWO (2) YEARS.

3. ALL EQUIPMENT, PIPING AND MATERIAL SPECIFIED HEREIN AFTER AS SHOWN ON THE DRAWINGS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR, UNLESS SPECIFICALLY INDICATED TO THE CONTRARY. INSTALLATION SHALL COMPLY WITH ALL REQUIRED “BUILDING CODES” AND “REFERENCE STANDARDS.”

4. IF THIS CONTRACTOR PROPOSES TO INSTALL EQUIPMENT REQUIRING SPACE CONDITIONS OTHER THAN THOSE AS SPECIFIED AND/OR SHOWN ON THE DESIGN DRAWINGS, OR TO REARRANGE THE EQUIPMENT, HE SHALL ASSUME FULL RESPONSIBILITY AND SUBMIT DRAWINGS FOR THE REARRANGEMENT OF THE SPACE AND SHALL OBTAIN THE FULL APPROVAL OF THE ARCHITECT PRIOR TO START OF ANY WORK.

5. THE EXACT LOCATIONS FOR FIXTURES, EQUIPMENT AND PIPING WHICH IS NOT COVERED BY DRAWINGS SHALL BE OBTAINED FROM THE ARCHITECT OR HIS REPRESENTATIVE IN THE FIELD AND THE WORK SHALL BE LAID OUT ACCORDINGLY.

6. DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT ONE ANOTHER. ANY MATERIALS OR LABOR CALLED FOR IN ONE BUT NOT THE OTHER SHALL BE FURNISHED AS IF BOTH WERE MENTIONED IN THE SPECIFICATIONS AND SHOWN ON THE DRAWINGS.

E. BASE BID EQUIPMENT, MATERIALS AND SUBSTITUTIONS

1. ALL EQUIPMENT AND MATERIALS SHALL BE NEW, FREE OF DEFECTS AND UL LABELED.

2. BASE BID MANUFACTURERS ARE INCLUDED IN THE SPECIFICATION OR LISTED IN SCHEDULES ON THE DRAWINGS. ALL OTHER MANUFACTURERS ARE CONSIDERED SUBSTITUTION.

3. THE NAME OR MAKE OF ANY ARTICLE, DEVICE, MATERIAL, FORM OF CONSTRUCTION, FIXTURE, ETC., STATED IN THIS SPECIFICATION, WHETHER OR NOT THE WORDS "OR APPROVED EQUAL" ARE USED, SHALL BE KNOWN AS A "STANDARD".

4. ALL COST SHALL BE BASED ON "STANDARDS" SPECIFIED.

5. THE EQUIPMENT SCHEDULES ON THE DRAWINGS INDICATE MANUFACTURER AND THEIR EQUIPMENT MODEL NUMBERS THAT THIS DESIGN HAS BEEN BASED ON. EACH CONTRACTOR IS REQUIRED TO BID UPON THE BASIS OF DESIGN AND FURNISH THE MAKES SPECIFIED.

6. WHERE MORE THAN ONE MAKE OR NAME IS MENTIONED AS BEING ACCEPTABLE, IT SHALL BE UNDERSTOOD THAT ONLY THE NAME OR MAKE REFERRING TO THE MANUFACTURERS MODEL NUMBERS OR SIZES SHALL BE CONSIDERED THE “SPECIFIED STANDARDS.” IT SHALL BE FURTHER UNDERSTOOD THAT OTHER MAKES AND NAMES, EVEN THOUGH MENTIONED, HAVE NOT BEEN CHECKED FOR DETAIL AND THAT THEIR SIZE AND ARRANGEMENT ARE THE CONTRACTOR'S RESPONSIBILITY THE SAME AS A PROPOSED SUBSTITUTE ITEM. THE USE OF OTHER MANUFACTURER'S EQUIPMENT THAT IS LISTED AS ACCEPTABLE ALTERNATES THAT ENTAILS GENERAL TRADES, STRUCTURAL, MECHANICAL, ELECTRICAL, ETC., REVISIONS IS THIS CONTRACTOR'S RESPONSIBILITY TO PROVIDE REVISIONS. ANY ADDITIONAL COST OF SUCH CHANGES SHALL BE PAID BY THE CONTRACTOR SUBMITTING THE ACCEPTABLE ALTERNATES WHICH NECESSITATES CHANGES IN INSTALLING SUCH SUBMITTED ALTERNATE EQUIPMENT, EVEN THOUGH SUCH COSTS MAY BE PART OF ANOTHER DIVISION OF WORK.

7. BIDS CONCERNING THE USE OF SUBSTITUTE PRODUCTS MUST BE ACCOMPANIED BY COMPLETE SPECIFICATIONS AND PERFORMANCE CHARACTERISTIC COVERING THESE PRODUCTS. CONTRACTOR SHALL PROVIDE ALL AVAILABLE TEST DATA AND EXPERIENCE RECORDS WHICH MAY BE HELPFUL TO THE ARCHITECT IN EVALUATING THE QUALITY AND/OR SUITABILITY OF ALTERNATE PRODUCTS.

8. CONTRACTOR IS ALSO INVITED TO BID ON ANY OTHER SIMILAR PRODUCTS THE CONTRACTOR DESIRES TO PROPOSE AS SUBSTITUTIONS, STATING ANY DIFFERENCE IN COST (ADD OR DEDUCT FROM BASE BID COST) FOR EACH PROPOSED SUBSTITUTION ON THE SUBSTITUTION SHEET. IF THE ARCHITECT DECIDES TO ACCEPT ANY OF THE PROPOSED SUBSTITUTIONS, PROPER NOTATIONS THEREOF SHALL BE MADE IN THE WRITTEN CONTRACT. WHERE SEVERAL MAKES ARE MENTIONED IN THE SPECIFICATIONS AND THE CONTRACTOR FAILS TO STATE THAT HE PREFERS A PARTICULAR MAKE IN HIS BID, THE OWNER SHALL HAVE THE RIGHT TO CHOOSE ANY OF THE MAKES MENTIONED WITHOUT CHANGE IN PRICE. NO CONSIDERATION WILL BE GIVEN TO PROPOSALS FOR ALTERNATIVE PRODUCTS UNLESS SUBMITTED WITH THE ORIGINAL BIDS.

9. SUBSTITUTIONS ARE SUBJECT TO THE APPROVAL OF THE OWNER. IF A SUBSTITUTION IS SUBMITTED, IT IS THE CONTRACTOR'S RESPONSIBILITY TO EVALUATE IT AND CERTIFY THAT THE SUBSTITUTION IS EQUIVALENT IN ALL RESPECTS TO THE BASE SPECIFICATIONS.

10. IF SUBSTITUTIONS ARE APPROVED, NOTIFY ALL OTHER CONTRACTORS, SUBCONTRACTORS, ETC., AFFECTED BY THE SUBSTITUTION AND FULLY COORDINATE WITH THEM. ANY COSTS RESULTING FROM SUBSTITUTION, WHETHER BY THIS CONTRACTOR OR OTHERS, SHALL BE THE RESPONSIBILITY OF AND PAID FOR BY THE SUBSTITUTING CONTRACTOR. APPROVED SHOP DRAWINGS DO NOT ABSOLVE THIS CONTRACTOR FROM THIS RESPONSIBILITY.

11. ALL EQUIPMENT SHALL BE INSTALLED IN FULL ACCORDANCE WITH THE MANUFACTURER'S DATA AND INSTALLATION INSTRUCTIONS AND SERVICE CLEARANCES. IT IS THIS CONTRACTOR'S RESPONSIBILITY TO CHECK AND CONFIRM THESE REQUIREMENTS PRIOR TO STARTING OF ANY WORK.

F. WARRANTY

1. FULLY WARRANT ALL MATERIALS, EQUIPMENT AND WORKMANSHIP AND THE SUCCESSFUL OPERATION OF ALL EQUIPMENT AND APPARATUS INSTALLED BY THIS CONTRACTOR FOR ONE (1) YEAR FROM DATE OF FINAL ACCEPTANCE.

2. REPAIR OR REPLACE WITHOUT MATERIAL AND LABOR CHARGE TO THE OWNER ALL ITEMS FOUND DEFECTIVE DURING THE WARRANTY PERIODS. IN THE CASE OF REPLACEMENT OR REPAIR DUE TO FAILURE WITHIN THE WARRANTY PERIOD, THE WARRANTY ON THAT PORTION OF THE WORK SHALL BE EXTENDED FOR A MINIMUM PERIOD OF ONE (1) YEAR FROM THE DATE OF SUCH REPLACEMENT OR REPAIR.

G. SHOP DRAWING SUBMITTALS

1. SUBMIT SHOP DRAWINGS FOR MECHANICAL CONTROL SYSTEMS; INCLUDING BUT NOT LIMITED TO SHEETMETAL, MECHANICAL FIXTURES AND EQUIPMENT WITH ADEQUATE DETAILS AND SCALES TO CLEARLY SHOW CONSTRUCTION. INDICATE THE OPERATING CHARACTERISTICS FOR EACH REQUIRED ITEM. CLEARLY IDENTIFY EACH ITEM ON THE SUBMITTAL AS TO MARK, LOCATION AND USE, USING THE SAME IDENTIFICATION AS PROVIDED ON THE CONSTRUCTION DOCUMENTS.

2. SHEETMETAL AND FIRE PROTECTION SHOP DRAWINGS SHALL BE FULLY DIMENSIONED AND COORDINATED BASED ON FIELD VERIFIED BUILDING DIMENSIONS AND CLEARANCES AND ARCHITECTURAL CEILING LAYOUTS. INDICATE STRUCTURAL SYSTEMS, LIGHTING AND PIPING AT ALL CRITICAL LOCATIONS.

3. CONTRACTOR SHALL REVIEW AND INDICATE HIS APPROVAL OF EACH SHOP DRAWING PRIOR TO SUBMITTAL FOR REVIEW. SHOP DRAWINGS WILL NOT BE REVIEWED BY THE ENGINEER UNLESS THE CONTRACTOR'S APPROVAL IS NOTED. DO NOT START WORK OR FABRICATION UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED BY THE ENGINEER AND RETURNED TO THE CONTRACTOR.

4. SUBMITTALS WILL BE REVIEWED ONLY FOR GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS AND NOT FOR DIMENSIONS OR QUANTITIES. THE ARCHITECT AND ENGINEER WILL MAKE EVERY EFFORT TO DETECT AND CORRECT ERRORS, OMISSIONS, AND INACCURACIES IN SUCH DRAWINGS, BUT THE FAILURE TO DETECT ERRORS, OMISSIONS, AND INACCURACIES SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR THE PROPER AND COMPLETE INSTALLATION IN ACCORDANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS. THE SUBMITTAL REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PURCHASE OF ANY ITEM IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS OR ITS COMPLETE AND PROPER INSTALLATION.

5. WHERE SUBMITTALS VARY FROM THE CONTRACT REQUIREMENTS, THE CONTRACTOR SHALL CLEARLY INDICATE ON SUBMITTAL OR ACCOMPANYING DOCUMENTS THE NATURE AND REASON FOR THE VARIATIONS.

6. EACH MANUFACTURER OR HIS REPRESENTATIVE MUST CHECK THE APPLICATION OF HIS EQUIPMENT AND CERTIFY AT TIME OF SHOP DRAWING SUBMITTAL THAT THE EQUIPMENT SPECIFIED HAS BEEN PROPERLY APPLIED AND CAN BE INSTALLED, SERVICED AND MAINTAINED WHERE INDICATED ON THE DRAWINGS. ADVISE ENGINEER IN WRITING WITH SUBMITTAL DRAWINGS OF ANY POTENTIAL PROBLEMS. THE MANUFACTURER SHALL BE RESPONSIBLE FOR ANY CHANGES THAT MIGHT BE NECESSARY BECAUSE OF PHYSICAL CHARACTERISTICS OF EQUIPMENT THAT HAVE NOT BEEN CALLED TO THE ENGINEER'S ATTENTION AT THE TIME OF SUBMITTAL.

7. SUBMIT A MINIMUM OF ONE (1) PRINT AND AN ELECTRONIC “PDF” OF SHOP DRAWINGS TO THE ARCHITECT. THE ARCHITECT AND ENGINEER SHALL REVIEW AND RETURN A PDF. THE CONTRACTOR SHALL DISTRIBUTE COPIES AS REQUIRED TO PROPERLY CONDUCT THWORK, INCLUDING REQUIREMENTS OF THE OPERATING MANUAL.

H. RECORD DRAWINGS

1. EACH CONTRACTOR OR SUBCONTRACTOR SHALL KEEP ONE (1) COMPLETE SET OF THE CONTRACT DRAWINGS AND EQUIPMENT SUBMITTALS ON THE JOB SITE ON WHICH HE SHALL REGULARLY RECORD ANY DEVIATIONS OR CHANGES FROM SUCH CONTRACT DRAWINGS MADE DURING CONSTRUCTION. ALL RECORDING SHALL BE DONE IN COLOR INK.

2. THESE DRAWINGS SHALL RECORD THE INSTALLED LOCATION OF ALL CONCEALED EQUIPMENT, PIPING, ELECTRIC SERVICE, SEWERS, WASTES, VENTS, DUCTS, CONDUIT, ETC., BY MEASURE DIMENSIONS TO EACH SUCH ITEM FROM COLUMN CENTERLINES OR READILY IDENTIFIABLE AND ACCESSIBLE WALLS OR CORNERS OF THE BUILDING. PLANS ALSO SHALL SHOW INVERT ELEVATION OF SEWERS AND TOP ELEVATION OF ALL OTHER BELOW-GRADE LINES.

3. RECORD DRAWINGS SHALL BE KEPT CLEAN AND UNDAMAGED AND SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN RECORDING DEVIATIONS FROM WORKING DRAWINGS AND EXACT LOCATIONS OF CONCEALED WORK.

4. AFTER THE PROJECT IS COMPLETED, THESE DRAWINGS SHALL BE SCANNED TO AN ELECTRONIC “PDF” FORMAT AND PDF AND HARD DRAWINGS SHALL BE DELIVERED TO THE ARCHITECT IN GOOD CONDITION, AS A PERMANENT RECORD OF THE INSTALLATION AS ACTUALLY CONSTRUCTED.

I. SUPERVISION

1. THE CONTRACTOR SHALL HAVE IN CHARGE OF WORK AT ALL TIMES DURING CONSTRUCTION A COMPETENT FOREMAN OR SUPERINTENDENT WHOSE EXPERIENCE AND BACKGROUND SHALL QUALIFY HIM FOR THE WORK TO BE PERFORMED UNDER THIS DIVISION. ONCE ASSIGNED, THE FOREMAN OR SUPERINTENDENT SHALL BE RETAINED UNTIL COMPLETION OF THE PROJECT AND ANY CONSIDERATION AS TO HIS REMOVAL ON GROUNDS OF INCOMPETENCE SHALL EITHER BE INITIATED BY OR REFERRED TO THE ARCHITECT FOR DECISION.

SECTION 200510 - BASIC MATERIALS AND METHODS

A. GENERAL

1. PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, AND ACCESSORIES REQUIRED TO FURNISH AND INSTALL THE MECHANICAL ITEMS IDENTIFIED IN THIS SECTION.

2. THIS SECTION INCLUDES BASIC MECHANICAL MATERIALS AND METHODS TO COMPLEMENT OTHER DIVISION SECTIONS IN THIS SPECIFICATION AND REQUIREMENTS INDICATED ON THE MECHANICAL DRAWINGS.

B. INTERFERENCES

1. BEFORE INSTALLING ANY WORK, CONTRACTOR SHALL SEE THAT IT DOES NOT INTERFERE WITH CLEARANCE REQUIRED FOR FINISH ON BEAMS, COLUMNS, PILASTERS, WALLS, OR OTHER STRUCTURAL OR ARCHITECTURAL MEMBERS, AS SHOWN ON ARCHITECTURAL DRAWINGS. IF ANY WORK IS SO INSTALLED AND IT LATER DEVELOPS THAT ARCHITECTURAL DESIGN CANNOT BE FOLLOWED, CONTRACTOR SHALL, AT HIS OWN EXPENSE, MAKE SUCH CHANGES IN HIS WORK AS ARCHITECT MAY DIRECT TO PERMIT COMPLETION OF ARCHITECTURAL WORK IN ACCORDANCE WITH PLANS AND SPECIFICATIONS.

2. REPORT ANY INTERFERENCES BETWEEN WORK UNDER THIS DIVISION AND THAT OF ANY OTHER CONTRACTORS TO ARCHITECT AS SOON AS THEY ARE DISCOVERED. ARCHITECT WILL DETERMINE WHICH EQUIPMENT SHALL BE RELOCATED, REGARDLESS OF WHICH WAS FIRST INSTALLED, AND HIS DECISION SHALL BE FINAL.

C. PROTECTION OF WORK AND PROPERTY

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFEGUARDING WORK, PROPERTY, AND FACILITIES AGAINST DAMAGE, BOTH HIS OWN AS WELL AS OTHERS WITH WHICH HE MAY COME INTO CONTACT IN THE PERFORMANCE OF HIS WORK.

2. STORED MATERIALS SHALL BE PROTECTED AGAINST DAMAGE FROM WEATHER. PIPE AND DUCT OPENINGS SHALL BE CLOSED WITH CAPS OR PLUGS DURING INSTALLATION. ALL FIXTURES AND EQUIPMENT SHALL BE COVERED AND PROTECTED AGAINST DAMAGE. ANY MATERIALS OR EQUIPMENT DAMAGED AT ANY STAGE IN THE CONSTRUCTION SHALL BE REPLACED OR REPAIRED. FINAL COMPLETION, ALL WORK SHALL BE IN A CLEAN AND UNBLEMISHED CONDITION.

3. DURING CONSTRUCTION, ALL RETURN AIR DUCTWORK AND TRANSFER AIR OPENINGS SERVING NEW AND EXISTING AIR HANDLING EQUIPMENT AND/OR ADJACENT TENANT SPACES SHALL BE PROTECTED. OPENINGS WHICH NEED TO REMAIN ACTIVE SHALL BE COVERED AND PROTECTED WITH MERV 8 FILTRATION MEDIA; OPENINGS WHICH CAN REMAIN INACTIVE DURING CONSTRUCTION SHALL BE COVERED WITH PLASTIC SHEATHING AND SEALED AIR TIGHT. FILTER MEDIA SHALL BE REPLACED REGULARLY AS REQUIRED DURING CONSTRUCTION IN ORDER TO ENSURE ADEQUATE AIRFLOW THROUGH ALL REQUIRED ACTIVE OPENINGS. IN ADDITION, AT THE END OF EACH PHASE OF CONSTRUCTION AND AT THE END OF THE CONSTRUCTION PROJECT, ALL FILTRATION MEDIA WITHIN EACH PIECE OF EQUIPMENT SERVING THE SPACE SHALL BE REPLACED.

E. SUPPORTS AND HANGERS

1. HANGERS AND SUPPORTS ARE TO BE PROVIDED TO PROPERLY SUPPORT, SECURE AND ALIGN PIPING AND TO MEET FIELD CONDITIONS AND AS MANUFACTURED BY GRINNELL, MICHIGAN HANGER OR CADDY.

2. ALL HANGERS, BRACKETS, CLAMPS, ETC., SHALL BE OF STANDARD WEIGHT STEEL. PERFORATED STRAP HANGERS SHALL NOT BE USED IN ANY WORK. WHEN TWO OR MORE PIPES ARE RUN PARALLEL, THEY MAY BE SUPPORTED ON UNISTRUT-TYPE TRAPEZE HANGERS. OTHER HANGERS FOR PIPE 3” IN SIZE AND SMALLER SHALL BE CLEVIS. FOR PIPE TRANSPORTING MEDIUM ABOVE 150 DEGREES F AND 4” IN SIZE AND ABOVE, USE PIPE ROLL. EACH HANGER IS TO BE SIZED TO INCLUDE PIPE INSULATION SADDLE FOR PROTECTION.

3. WHERE BUILDING SERVICE LINES ENTER OR LEAVE BUILDING SUCH AS WATER, SEWER, GAS, ETC., AND ARE INSTALLED ON FILLED EARTH, PROVIDE CONTINUOUS SUPPORT ON A REINFORCED CONCRETE BEAM FURNISHED AND INSTALLED UNDER THIS DIVISION. SUPPORT BEAM ON BUILDING AND WITH VERTICAL SUPPORT DOWN TO FOUNDATION FOOTING AND ON UNDISTURBED EARTH AT OTHER END. GAS MAIN SHALL ENTER BUILDING ABOVE GRADE.

4. ALL VERTICAL PIPING PASSING THROUGH FLOORS SHALL BE SUPPORTED AT THE FLOOR BY A RISER CLAMP.

5. ISOLATE ALL COPPER LINES FORM FERROUS HANGERS OR SUPPORTS BY USING FOIL FILLER OR VINYL TAPE.

6. PACING TO COMPLY WITH ASHRAE STANDARDS AND CODE REQUIREMENTS.

F. PIPE SLEEVES, FLOOR AND CEILING PLATES

1. ALL PIPES PASSING THROUGH FLOORS OR MASONRY WALLS SHALL BE PROVIDED WITH MACHINE-CUT SCHEDULE 40 PIPE STEEL SLEEVES. THE SLEEVES SHALL BE SO SIZED TO ALLOW AT LEAST 1/4" CLEARANCE BETWEEN THE INSIDE SLEEVE WALL AND THE PIPE OR INSULATION SURFACE. SHEET METAL SLEEVES SHALL NOT BE USED IN THIS WORK. PIPE SLEEVES ARE TO EXTEND 2” ABOVE FINISHED FLOOR AND SEALED. PIPE SLEEVES ARE TO BE FULL WALL THICKNESS AND SEALED.

2. UNUSED SLEEVES SHALL BE PLUGGED AND FINISHED TO MATCH ADJOINING SURFACE.

G. ESCUTCHEONS

1. FIT ALL PIPE PASSING THROUGH WALLS, FLOORS OR CEILINGS IN FINISHED ROOMS WITH STEEL OR BRASS ESCUTCHEONS. WHERE SURFACE IS TO RECEIVE A PAINT FINISH, MAKE ESCUTCHEONS PRIME PAINTED; OTHERWISE, MAKE ESCUTCHEONS NICKEL OR CHROME PLATED. WHERE PIPING IS INSULATED, FIT ESCUTCHEONS OUTSIDE INSULATION.

H. PIPE IDENTIFICATION AND TAGS

1. IDENTIFY EACH PIPE, VALVE AND CONTROLS IN EQUIPMENT ROOMS, ABOVE ACCESSIBLE CEILINGS AND IN ACCESSIBLE SHAFTS.

2. COLOR CODE IDENTIFICATION BANDS OR MARKER BACKGROUNDS TO IDENTIFY CONTENTS OF PIPE WITH INITIALS AND DIRECTION OF FLOW LOCATED NEAR EACH VALVE AND FITTING, ON BOTH SIDES OF PIPE PASSING THROUGH WALLS AND ON LONG RUNS AT NOT OVER 20'-0” INTERVALS.

3. AT PLACE WHERE PIPE IS TO HAVE MARKING, COVERED PIPE SHALL BE PROPERLY PRIMED WITH CLEAR LACQUER. AFTER MARKING IS APPLIED, COAT WITH LACQUER. APPLY MARKING ADJACENT TO VALVES AND EQUIPMENT AT MAJOR CHANGES IN DIRECTIONS, WHERE PIPES PASS THROUGH WALLS OR FLOORS.

4. ALL VALVES SHALL BE PROVIDED WITH BRASS NUMBERED TAGS ATTACHED TO HANDLE WITH A BRASS CHAIN OR RING. WIRING OF TAGS WILL NOT BE ACCEPTABLE. AT THE COMPLETION OF THE WORK, A REPRODUCIBLE VALVE SCHEDULE SHALL BE PROVIDED. THREE (3) COPIES OF THIS SHALL BE MOUNTED IN METAL, GLASS COVERED FRAMES WHERE REQUESTED BY THE ARCHITECT. THE SCHEDULE SHALL GIVE A DESCRIPTION OF THE LINE OR EQUIPMENT CONTROLLED; THE NORMAL POSITION, EMERGENCY AND/OR SHUTDOWN POSITION AND LOCATION GIVEN EITHER BY DESCRIPTION OR DIAGRAM. ALL CONTROLS, STARTERS, SWITCHES, ETC, SHALL BE IDENTIFIED BY EMBOSSED STENCIL OR ENGRAVED PLATE AS TO PURPOSE AND/OR EQUIPMENT CONTROLLED. CONTROL WIRING SHALL BE IDENTIFIED WITH PROGRAM NUMBER AND DEVICE IT SERVICES.

I. ACCESS PANELS

1. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL REQUIRED ACCESS PANELS NECESSARY FOR HIS WORK. THIS INCLUDES ANY ACCESS PANELS REQUIRED FOR MECHANICAL EQUIPMENTS. EACH CONTRACTOR SHALL ALSO PROVIDE ACCESS PANELS FOR ANY EXISTING CONDITIONS AS REQUIRED.

2. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR TYPE OF ACCESS PANEL AND COORDINATE LOCATIONS PRIOR TO ANY WORK.

3. CONTRACTOR SHALL MARK LAY-IN CEILING TILES, IN A METHOD APPROVED BY THE ARCHITECT, WHERE ACCESS IS REQUIRED TO SUCH MECHANICAL, PLUMBING, AND FIRE PROTECTION EQUIPMENT, VALVES, REGULATORS, MIXING BOXES, FIRE DAMPER, ETC.

J. NOISE AND VIBRATION ISOLATION

1. FURNISH AND INSTALL VIBRATION ISOLATING MOUNTINGS TO ISOLATE FROM THE STRUCTURE, BY MEANS OF RESILIENT VIBRATION AND NOISE ISOLATORS, ALL MECHANICAL EQUIPMENT OVER 1 HP HAVING ROTATING OR RECIPROCATING PARTS. ISOLATORS SHALL BE SUPPLIED BY A SINGLE SOURCE, AND SHALL BE GUARANTEED BY THE MANUFACTURER TO PROVIDE ISOLATION EFFICIENCIES IN ACCORDANCE WITH THIS SPECIFICATION. SELECTION SHALL BE BASED ON EQUIPMENT PURPOSED, POWER DISSIPATED, FREQUENCY, WEIGHT DISTRIBUTION AND NATURE OF THE BUILDING STRUCTURE. MOUNTINGS SHALL BE DESIGNED TO PERMIT ATTACHMENT TO THE EQUIPMENT BASE OR PAD AND TO THE STRUCTURE AND SHALL BE SELECTED FOR UNIFORM DEFLECTION ALLOWING FOR UNEQUAL WEIGHT DISTRIBUTION.

2. SELECTION SHALL BE MADE BY THE MANUFACTURER OF THE MOUNTINGS TO PROVIDE A TRANSMISSIBILITY NOT EXCEEDING 10 PERCENT. THIS CONTRACTOR SHALL PROVIDE INERTIA PADS FOR EQUIPMENT WHERE CALLED FOR ON DRAWINGS OR RECOMMENDED BY THE MANUFACTURER OF THE MOUNTINGS. THESE SHALL CONSIST OF REINFORCED CONCRETE PADS OF SUITABLE SHAPE, OF WEIGHT 1-1/2 TIMES THE WEIGHT OF THE EQUIPMENT AND PROVIDED WITH WELD PLATES OR CHANNELS AT THE CORNERS TO WHICH THE MOUNTINGS MAY BE SECURED

3. VIBRATION OR NOISE CREATED IN ANY PART OF THE BUILDING BY THE OPERATION OF ANY EQUIPMENT FURNISHED AND/OR INSTALLED UNDER THIS CONTRACT WILL BE PROHIBITED, AND THIS CONTRACTOR SHALL TAKE ALL PRECAUTIONS BY ISOLATING THE VARIOUS ITEMS OF EQUIPMENT, PIPE AND SHEET METAL WORK FORM THE BUILDING STRUCTURE. THE MAJOR ITEMS OF EQUIPMENT SHALL BE ISOLATED AS CALLED FOR ON THE PLANS AND SPECIFIED HEREIN. THE MINOR ITEMS SHALL BE HELD THE RESPONSIBILITY OF THIS CONTRACTOR.

4. MECHANICAL EQUIPMENT NOT INTERNALLY ISOLATED BY THE MANUFACTURER SHALL BE ISOLATED AS FOLLOWS:
   A. CONNECTIONS FROM PUMP OUTLET AND DISCHARGE NOZZLES TO PIPING SHALL BE MADE WITH FLEXIBLE CONNECTORS.

   B. CENTRIFUGAL FANS, AIR CONDITIONING AND/OR HEATING AND VENTILATING UNITS UP TO 3”STATIC PRESSURE ON GRADE SHALL BE MOUNTED ON PRECOMPRESSED MOLDED FIBERGLASS, RUBBER-IN-SHEAR, OR STEEL SPRING ISOLATORS. IF THE DRIVE MOTOR IS NOT SUPPORTED DIRECTLY ON THE FAN, BOTH UNITS SHALL BE MOUNTED ON AN INTEGRAL STRUCTURAL STEEL BASE SUPPLIED BY THE ISOLATOR MANUFACTURER, OR SUFFICIENT RIGIDITY TO MAINTAIN ALIGNMENT BETWEEN THE FAN AND THE DRIVE MOTOR. THE BASE SHALL, IN TURN BE MOUNTED ON PRECOMPRESSED MOLDED FIBERGLASS, RUBBER-IN-SHEAR, OR STEEL SPRING ISOLATORS. THE FANS' ISOLATORS SHALL PROVIDE ISOLATION EFFICIENCIES AS FOLLOWS:
   FAN SPEED OVER 700 RPM 95 PERCENT
   FAN SPEED BETWEEN 450 AND 700 RPM 90 PERCENT
   FAN SPEED BELOW 450 RPM, FAN
   WHEEL OVER 48” DIAMETER
   FAN SPEED BELOW 450 RPM, FAN
   WHEEL UNDER 48” DIAMETER 80 PERCENT NOISE ISOLATION ONLY

   C. CENTRIFUGAL FANS, AIR CONDITIONING AND/OR HEATING AND VENTILATING UNITS UP TO 3” STATIC PRESSURE ABOVE GRADE SHALL BE MOUNTED ON STEEL SPRING VIBRATION ISOLATORS IN COMBINATION WITH PRECOMPRESSED MOLDED FIBERGLASS NOISE ISOLATION PADS. IF THE DRIVE MOTOR IS NOT SUPPORTED DIRECTLY ON THE FAN, BOTH UNITS SHALL BE MOUNTED ON AN INTEGRAL CONCRETE INERTIA BASE, SUPPLIED BY THE ISOLATOR MANUFACTURER, OF SUFFICIENT RIGIDITY TO MAINTAIN ALIGNMENT BETWEEN THE FAN AND ISOLATORS IN COMBINATION WITH PRECOMPRESSED MOLDED FIBERGLASS NOISE ISOLATION PADS. SEE “C” ABOVE FOR ISOLATION EFFICIENCIES.

   D. CENTRIFUGAL FANS, AIR CONDITIONING AND/OR HEATING AND VENTILATING UNITS UP TO 3” STATIC PRESSURE CEILING SUSPENDED SHALL BE MOUNTED ON A SUITABLE PLATFORM AND THE PLATFORM IN TURN, SUSPENDED BY THREADED RODS FROM THE OVERHEAD STRUCTURE. RESILIENT HANGERS INCORPORATING STEEL SPRINGS AND PRECOMPRESSED MOLDED INSERTS SHALL BE INCORPORATED INTO EACH SUPPORTING ROD. SEE “C” ABOVE FOR ISOLATION EFFICIENCIES.

   E. CENTRIFUGAL FANS, AIR CONDITIONING AND/OR HEATING AND VENTILATING UNITS OVER 3” STATIC PRESSURE SHALL BE MOUNTED ON A REINFORCED CONCRETE INERTIA BLOCK WHOSE WEIGHT IS EQUAL TO OR GREATER THAN THAT OF THE SUPPORTED EQUIPMENT. THE CONCRETE SHALL BE POURED INTO A WELDED STEEL CHANNEL FRAME WITH WELDED-IN REINFORCING BARS AND PRELOCATED EQUIPMENT ANCHOR BOLTS, ALL SUPPLIED BY THE ISOLATOR MANUFACTURER. THE INERTIA BLOCK SHALL BE MOUNTED ON STEEL SPRING VIBRATION ISOLATORS IN COMBINATION WITH PRECOMPRESSED MOLDED FIBERGLASS NOISE ISOLATION PADS.

   SEE “C” ABOVE FOR ISOLATION EFFICIENCIES.

   F. PUMPS UP TO 5 HP SHALL BE MOUNTED ON RAILS, INCORPORATING PRECOMPRESSED MOLDED FIBERGLASS, RUBBER-IN-SHEAR, OR STEEL SPRING ISOLATORS. THE ISOLATORS SHALL PROVIDE 90 PERCENT ISOLATION EFFICIENCY.

5. PIPING AND DUCTWORK SHALL BE SUPPORTED INDEPENDENTLY OF THE MECHANICAL EQUIPMENT AND SHALL BE ISOLATED AS FOLLOWS:

   A. ALL SUSPENDED PIPING IN THE MECHANICAL EQUIPMENT AND AIR HANDLING ROOMS SHALL BE SUPPORTED FROM THE OVERHEAD STRUCTURE BY THREADED RODS INCORPORATING RESILIENT HANGERS. THE RESILIENT HANGERS SHALL CONTAIN STEEL SPRINGS AND PRECOMPRESSED MOLDED FIBERGLASS INSERTS, DESIGNED FOR STATIC DEFLECTIONS OF BETWEEN 1” AND 1-3/4” UNDER OPERATING CONDITIONS.

   B. ALL FLOOR SUPPORTED PIPING AND PIPE HANGERS IN THE MECHANICAL EQUIPMENT ROOMS SHALL BE MOUNTED ON STEEL SPRING VIBRATION ISOLATORS IN COMBINATION WITH PRECOMPRESSED MOLDED FIBERGLASS NOISE ISOLATORS, DESIGNED FOR MINIMUM STATIC DEFLECTIONS OF 1”.

   C. SUSPENDED PIPING ENTERING OR LEAVING MECHANICAL OR AIR HANDLING EQUIPMENT OUTSIDE THE EQUIPMENT ROOMS SHALL BE SUPPORTED FOR THE FIRST THREE HANGERS AWAY FROM THE EQUIPMENT BY THREADED RODS INCORPORATING RESILIENT HANGERS FROM THE OVERHEAD STRUCTURE. THE RESILIENT HANGERS SHALL CONTAIN STEEL SPRINGS AND PRECOMPRESSED MOLDED FIBERGLASS INSERTS, DESIGNED FOR STATIC DEFLECTIONS BETWEEN 1” AND 1-3/4” UNDER OPERATING CONDITIONS.

   D. FLOOR SUPPORTED PIPING ENTERING OR LEAVING MECHANICAL EQUIPMENT OUTSIDE THE EQUIPMENT ROOM SHALL BE MOUNTED ON STEEL SPRING VIBRATION ISOLATORS IN COMBINATION WITH PRECOMPRESSED MOLDED FIBERGLASS NOISE ISOLATORS, DESIGNED FOR MINIMUM STATIC DEFLECTIONS OF 1” FOR THE FIRST THREE SUPPORTS.

   E. FLEXIBLE CONNECTIONS SHALL BE USED BETWEEN AIR HANDLING EQUIPMENT AND DUCTWORK.

   F. ALL DUCTWORK WITHIN THE MECHANICAL EQUIPMENT AND AIR HANDLING ROOMS SHALL E SUSPENDED WITH ROD AND RUBBER-IN-SHEAR HANGERS.

6. ISOLATION EFFICIENCY SHALL BE BASED ON THE LOWEST OPERATING SPEED OF THE SUPPORTED EQUIPMENT. THE ISOLATOR MANUFACTURER SHALL PROVIDE, AS A PART OF HIS SUBMITTAL DATA, ISOLATING EFFICIENCIES FOR THE ISOLATORS SUPPORTING EACH PIECE OF EQUIPMENT. ISOLATORS SHALL BE MANUFACTURED BY CONSOLIDATED KINETICS CORP., 401 DUBLIN AVENUE, COLUMBUS, OHIO, OR MASON INDUSTRIES, INC., HOLLIS, NEW YORK.

M. MISCELLANEOUS STEEL
   1. FURNISH AND INSTALL ALL MISCELLANEOUS STEEL REQUIRED FOR SUPPORTS, HANGERS, ANCHORS, GUIDES, ETC. REQUIRED FOR INSTALLATION OF EQUIPMENT AND MATERIALS FURNISHED AND INSTALLED UNDER THIS DIVISION.

N. PAINTING
   1. THIS CONTRACTOR SHALL PERFORM ALL PAINTING INCIDENTAL TO THIS WORK.

   2. ALL INSULATION SHALL BE PAINTED AT THE TIME OF INSTALLATION WITH ONE COAT OF BENJAMIN FOSTER “LAGTONE” WATER BASE PAINT. AT THE COMPLETION OF THE WORK, ALL SUCH INSULATION SHALL BE GIVEN AN ADDITIONAL COAT OF ALKYD RESIN PAINT OF A COLOR TO MATCH EXISTING BUILDING STRUCTURE OR AS SELECTED BY THE ARCHITECT.

   3. ALL UNCOVERED BLACK IRON PIPE, FITTINGS, IRON PORTIONS OF VALVES, HANGERS, STRUCTURAL STEEL, EXPANSION TANKS, COOLING TOWER SUMPS AND ALL OTHER BLACK IRON WORK SHALL BE THOROUGHLY CLEANED AND GIVEN TWO COATS OF ALKYD RESIN PAINT OF A COLOR TO MATCH EXISTING BUILDING STRUCTURE OR AS SELECTED BY THE ARCHITECT.

   4. ALL UNCOVERED EXPOSED SHEET METAL SHALL BE THOROUGHLY CLEANED AND NEUTRALIZED AND GIVEN TWO (2) COATS OF ALKYD RESIN PAINT OF A COLOR TO MATCH EXISTING BUILDING STRUCTURE OR AS SELECTED BY THE ARCHITECT.

   5. ALL PAINTING SHALL BE DONE WITH A BRUSH OR ROLLER. SPRAY PAINTING WILL BE PROHIBITED.

   6. ALL FINISHING MATERIALS, THINNERS, ETC., SHALL BE THE BEST QUALITY, FIRST LINE MATERIALS AS MANUFACTURED BY:
   A. E.I. DUPONT DE NEMOURS AND COMPANY
   B. PRATT AND LAMBERT, INC.
   C. THE GLIDDEN COMPANY
   D. THE SHERWIN-WILLIAMS COMPANY
   E. THE PITTSBURGH PLATE GLASS COMPANY

   7. ORIGINAL UNOPENED AND LABELED CONTAINERS, AND THEY SHALL BE USED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS.

   8. THIS CONTRACTOR SHALL SUBMIT A LIST OF MATERIALS TO THE ARCHITECT. THE LIST SHALL STATE THE BRANCH NAMES OF THE MATERIALS THAT THE CONTRACTOR

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TITLE:

MECHANICAL SPECIFICATIONS (1 OF 3)

SHEET NUMBER:

M-300

INTENDS TO USE. THIS LIST SHALL BE SECURED FROM THE PAINT MANUFACTURER AND SHALL BE ON HIS STATIONERY

9. THE ARCHITECT'S APPROVAL MUST BE SECURED BEFORE ANY PAINTING WORK IS STARTED.

SECTION 23 05 93

TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.0 GENERAL

1.01 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION IS GOVERNED BY THE COMMON WORK RESULTS FOR HVAC SECTION 23 05 00.

B. THIS SECTION 23 05 93 AND THE ACCOMPANYING DRAWINGS COVER THE PROVISION OF ALL LABOR, EQUIPMENT, APPLIANCES, AND MATERIALS AND PERFORMING ALL OPERATIONS IN CONNECTION WITH THE TESTING AND BALANCING (TAB) OF THE HEATING, VENTILATING AND AIR CONDITIONING (HVAC) SYSTEMS AS SPECIFIED HEREIN AND AS SHOWN. THESE SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

1. SUPPLY DISTRIBUTION SYSTEMS

2. RETURN AND EXHAUST AIR SYSTEMS

3. HEATING, VENTILATING AND AIR CONDITIONING EQUIPMENT (ALL SCHEDULED EQUIPMENT AS A MINIMUM)

4. HYDRONIC SYSTEMS

1.02 INTENT

A. IT IS THE INTENT OF THIS SECTION OF THE SPECIFICATIONS TO PROVIDE A COMPLETE OPERABLE AND BALANCED HVAC SYSTEM AS SHOWN AND SPECIFIED WHICH IS REASONABLY AIRTIGHT, COMFORTABLE AND FREE OF OBJECTIONABLE NOISE AND VIBRATION.

1.03 SCOPE OF WORK

A. HVAC TEST AND BALANCE SHALL BE PERFORMED BY AN INDEPENDENT AGENCY CERTIFIED BY THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB) UNDER DIRECT CONTRACT TO THE GENERAL CONTRACTOR. ALL WORK PERFORMED BY THIS AGENCY SHALL BE PERFORMED BY QUALIFIED TECHNICIANS UNDER THE DIRECT SUPERVISION OF AN AABC OR NEBB CERTIFIED TEST AND BALANCE ENGINEER. THE AGENCY SHALL BE INDEPENDENT AND SHALL NOT BE ASSOCIATED IN ANY WAY WITH THE INSTALLING HVAC SUBCONTRACTOR.

B. HVAC TEST AND BALANCE SHALL BE PERFORMED IN ACCORDANCE WITH THE 7TH EDITION OF THE AABC NATIONAL STANDARDS, 2016 FOR TOTAL SYSTEM BALANCE OR THE NEBB PROCEDURAL STANDARDS FOR TAB OF ENVIRONMENTAL SYSTEMS, 8TH EDITION, 2015 TOGETHER WITH THE NEBB TAB MANUAL FOR TECHNICIANS, 2ND EDITION.

C. THE FINAL TEST AND BALANCE REPORT SHALL SERVE TO SUBSTANTIATE COMPLIANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS, SPECIFICALLY THE HVAC SYSTEMS.

D. HVAC TEST AND BALANCE SHALL NOT BEGIN UNTIL THE SYSTEMS ARE SUBSTANTIALLY COMPLETE.

E. UPON THE COMPLETION OF THE TEST AND BALANCE WORK, THE AGENCY SHALL SUBMIT FOUR (4) COPIES OF THE COMPLETE HVAC TEST AND BALANCE REPORT DIRECTLY TO THE ARCHITECT.

F. THE AGENCY, AS A PART OF ITS CONTRACT WITH THE GENERAL CONTRACTOR, SHALL ACT AS AN AUTHORIZED INSPECTION AGENCY, RESPONSIBLE TO THE GENERAL CONTRACTOR AND THE ARCHITECT AND SHALL, DURING THE TEST AND BALANCE, LIST THOSE ITEMS WHICH REQUIRE CORRECTION OR HAVE NOT BEEN INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

G. THE AGENCY SHALL PLAINLY MARK THE SETTINGS OF ALL VALVES, DAMPERS AND OTHER ADJUSTABLE DEVICES. IF A BALANCING DEVICE IS PROVIDED WITH A MEMORY STOP, IT SHALL BE SET, LOCKED AND MARKED.

H. THE AGENCY SHALL RECORD ALL OF THE FINAL SET POINTS ON ALL VARIABLE SPEED DRIVES.

1.04 SUBMITTALS

A. THE NAME AND CERTIFICATION OF THE AGENCY, ALONG WITH THE NAME AND CERTIFICATION OF THE CERTIFIED TEST AND BALANCE ENGINEER, SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW WITHIN 30 DAYS AFTER THE AWARD OF THE GENERAL CONTRACT.

B. THE SELECTED AGENCY SHALL SUBMIT TO THE OWNER:

1. PROCEDURAL MANUAL
2. REPORT FORMS
3. AABC OR NEBB PERFORMANCE GUARANTEE
4. INSTRUMENT LIST AND CALIBRATION DATES
5. SCHEDULE
6. FLOOR PLANS AS NEEDED TO UNIQUELY IDENTIFY DEVICE LOCATIONS

C. A REVIEWED COPY OF EACH OF THE ABOVE SHALL BE RETURNED TO THE AGENCY BEFORE THE HVAC TEST AND BALANCE BEGINS.

D. IF A COMPLETE SUBMITTAL IN ACCORDANCE WITH THESE REQUIREMENTS IS NOT RECEIVED WITHIN 60 DAYS FROM AWARD OF THE GENERAL CONTRACT, THEN THE ARCHITECT RESERVES THE RIGHT TO SELECT THE AGENCY.

2.0 PRODUCTS

2.01 (NOT APPLICABLE)

3.0 EXECUTION

3.01 GENERAL CONTRACTOR'S DUTIES

A. THE GENERAL CONTRACTOR SHALL PROVIDE THE FOLLOWING, WITHIN 10 DAYS AFTER HIS RECEIPT, TO THE AGENCY:

1. CONTRACT DRAWINGS
2. CONTRACT APPLICABLE SPECIFICATION DIVISION 23 (OTHERS AS APPLICABLE)
3. ADDENDA
4. CHANGE ORDERS
5. REVIEWED SUBMITTALS

B. THE GENERAL CONTRACTOR SHALL START-UP AND MAINTAIN THE HVAC SYSTEMS AND SHALL CONTINUE THE OPERATION OF THE HVAC SYSTEMS DURING EACH DAY OF TESTING AND BALANCING. START-UP AND OPERATION SHALL INCLUDE, AS A MINIMUM, THE FOLLOWING:

1. ALL EQUIPMENT OPERABLE AND IN SAFE CONDITION.
2. TEMPERATURE CONTROL SYSTEM COMPLETE.
3. PROPER THERMAL OVERLOAD PROTECTION IN PLACE FOR ELECTRICAL EQUIPMENT.
4. DUCTWORK LEAKAGE RATES NOT EXCEEDING THOSE SPECIFIED AND ALL DUCT SYSTEMS CLEAN OF DEBRIS.
5. AIR TRANSFER SYSTEMS SHALL HAVE:
   a. CORRECT FAN ROTATION AND RPM.
   b. COIL FINS CLEANED AND COMBED.
   c. FILTERS CLEAN AND IN PLACE.
   d. ACCESS DOORS CLOSED.
   e. ALL DAMPERS IN PLACE AND OPEN.
   f. ALL GRILLES, REGISTERS, AND DIFFUSERS INSTALLED.

C. PROVIDE SUFFICIENT TIME BEFORE THE FINAL COMPLETION DATE SO THAT TESTING AND BALANCING CAN BE ACCOMPLISHED. COORDINATE THE SUBMITTED T&B SCHEDULE.

D. PROVIDE IMMEDIATE LABOR AND TOOLS TO MAKE REQUIRED CORRECTIONS AND REPAIRS WITHOUT UNDUE DELAY.

E. THE GENERAL CONTRACTOR AND HIS SUBCONTRACTORS SHALL COOPERATE FULLY WITH THE AGENCY TO PROVIDE THE FOLLOWING:

1. ACCESS TO HVAC SYSTEM COMPONENTS.
2. THE RIGHT TO ADJUST THE SYSTEMS.

F. ANY CONDITIONS WHICH PREVENT PROPER HVAC TEST AND BALANCE SHALL BE REPORTED BY THE AGENCY TO THE GENERAL CONTRACTOR AND ARCHITECT WITHIN 7 DAYS OF THEIR DISCOVERY.

G. IF IT IS DETERMINED BY THE AGENCY AND CONFIRMED BY THE ARCHITECT THAT DRIVE CHANGES OR ADDITIONAL BALANCING DAMPERS ARE REQUIRED, THE CONTRACTOR SHALL OBTAIN AND INSTALL ALL NECESSARY COMPONENTS.

H. THE AGENCY SHALL COOPERATE WITH THE ARCHITECT AND THE CONTRACTOR AND ALL HIS SUBCONTRACTORS TO PERFORM THE WORK IN SUCH A MANNER AS TO MEET THE JOB SCHEDULE.

I. THE AGENCY SHALL VERIFY THAT ALL SYSTEM COMPONENTS ARE IN PLACE AND IN PROPER WORKING ORDER PRIOR TO LEAVING THE PROJECT.

J. ALL REPORTED AND RECORDED DATA SHALL REPRESENT TRUE MEASURED CONDITIONS.

K. WHERE EQUIPMENT USES VARIABLE SPEED DRIVES, AND WHERE FEASIBLE, VFDS SHALL BE USED AS THE PRIMARY BALANCING METHOD PRIOR TO ADJUSTMENT OR BALANCING OF VALVES, DAMPERS, ETC.

END OF SECTION

SECTION 23 07 13

DUCT INSULATION

1.0 GENERAL

1.01 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION IS GOVERNED BY THE COMMON WORK RESULTS FOR HVAC SECTION 23 05 00.

B. THIS SECTION 23 07 13 AND THE ACCOMPANYING DRAWINGS COVER THE PROVISIONS OF ALL LABOR, EQUIPMENT, APPLIANCES, AND MATERIALS AND PERFORMING ALL OPERATIONS IN CONNECTION WITH THE CONSTRUCTION OF THE DUCTWORK SYSTEMS AS SPECIFIED HEREIN AND AS SHOWN. THESE SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

1. INSULATION FOR TYPICAL DUCTWORK
2. DUCT LINER
3. INSULATION FOR DUCTWORK OUTSIDE
4. INSULATION FOR GREASE EXHAUST DUCTWORK
5. INSULATION FOR GENERATOR EXHAUST PIPE

1.02 INTENT

A. IT IS THE INTENT OF THIS SECTION OF THE SPECIFICATIONS TO PROVIDE A COMPLETE OPERABLE DUCT SYSTEM AS SHOWN AND SPECIFIED WHICH IS REASONABLY AIRTIGHT, FREE OF NOISE, VIBRATION, AND SWEATING, AND FABRICATED SO AS TO FIT INTO THE SPACE ALLOTTED AND TO EXHIBIT A MINIMUM RESISTANCE TO AIRFLOW.

2.0 PRODUCTS

2.01 DUCT LINER

A. DUCT LINER SHALL BE ONE INCH THICK, 1 1 LB. DENSITY (3 LB. DENSITY ON MEDIUM- AND HIGH-PRESSURE SUPPLY AIR SYSTEMS EXCEPT THAT 1 1 LB. DENSITY IS ACCEPTABLE IF THE LINER IS AT LEAST R ≥ 4.2 AND NRC ≥ 0.6) FIBROUS GLASS WITH ONE FACE COATED WITH A BLOCK FIRE RETARDANT COMPOUND. THE PERMANENT COMPOSITE FIRE AND SMOKE HAZARD RATING OF THE LINER SHALL BE STENCILED ON THE LINER FACE AND SHALL BE:

MAXIMUM FLAME SPREAD 25

MAXIMUM SMOKE DEVELOPED 50

2.02 TYPICAL DUCT INSULATION

A. DUCT INSULATION SHALL BE 2" THICK, MINIMUM 3/4 LB. DENSITY FIBERGLASS WITH AN FSKL 0.00035" THICK ALUMINUM FOIL JACKET, REINFORCED WITH FIBERGLASS SCRIM. THERMAL CONDUCTIVITY SHALL BE A MAXIMUM OF K = 0.29 AT 75T MEAN TEMPERATURE, OR O MAXIMUM OF K=0.27 AT 25A COMPRESSION.

B. INSULATION ADHESIVE SHALL BE BENJAMIN FOSTER 85--20. TAPE SHALL BE ALUMINUN FOIL AND SHALL BE SMACNA LISTED AND LABELED.

C. THE COMPOSITE NFPA 90A AND 90B, ASTM E84, UL RATING OF THE INSTALLED INSULATION SHALL NOT EXCEED 25/50.

D. THE GREASE EXHAUST DUCTWORK SHALL HAVE ZERO--CLEARANCE TO COMBUSTIBLES WRAP FROM THE HOOD CONNECTION TO DISCHARGE TERMINATION. COORDINATE THE INSULATION WITH ALL REQUIRED ACCESS PANELS, DRAINS, ETC. AS REQUIRED BY NFPA 96.

2.03 PORTIONS OF SUPPLY-AIR AND RETURN-AIR DUCTS CONVEYING HEATED OR COOLED AIR LOCATED IN ONE OR MORE OF THE FOLLOWING SPACES SHALL BE INSULATED TO A MINIMUM INSTALLED LEVEL OF R-8:

A. OUTDOORS; OR
B. IN A SPACE BETWEEN THE ROOF AND AN INSULATED CEILING; OR
C. IN A SPACE DIRECTLY UNDER A ROOF WITH FIXED VENTS OR OPENINGS TO THE OUTSIDE OR UNCONDITIONED SPACES; OR
D. IN AN UNCONDITIONED CRAWLSPACE; OR IN OTHER UNCONDITIONED SPACES.

3.0 EXECUTION

3.1 INSTALLATION

A. DUCTWORK SHALL BE INSTALLED IN STRICT ACCORDANCE WITH SMACNA, UL, AND NFPA STANDARDS.

B. DUCT LINER SHALL BE PROVIDED THROUGHOUT ALL RETURN AIR, TRANSFER, AND PLENUMS. DUCT LINER SHALL ALSO BE PROVIDED FOR THE FOLLOWING MINIMUM DISTANCES, THROUGH THE FIRST ELBOW(S), OR AS OTHERWISE INDICATED ON THE DRAWINGS, WHICHEVER IS GREATER, DOWNSTREAM OF EACH UNIT INDICATED BELOW:

1. PACKAGED ROOFTOP UNIT — 10 FT

2. SELF-CONTAINED AIR CONDITIONING UNIT — 10 FT

3. CENTRAL AIR HANDLING UNIT — 10 FT

4. SPLIT SYSTEM AIR HANDLING UNIT — 10 FT

5. WATER-SOURCE HEAT PUMP — 10 FT

6. FAN COIL UNIT — 5 FT

7. TERMINAL UNIT — 5 FT

C. STRAIGHT RUNS ONLY SHALL BE FACTORED INTO THE ABOVE DISTANCE REQUIREMENTS. ELBOWS, ETC., WITHIN THE LENGTH SHALL BE LINED BUT SHALL NOT COUNT TOWARDS THE LENGTH REQUIREMENT.

D. DUCT LINER SHALL NOT BE INSTALLED WITHIN SIX INCHES OF A DAMPER, INCLUDING FIRE AND/OR SMOKE DAMPERS. METAL CASINGS ARE REQUIRED ON THE DOWNSTREAM SIDE OF THE EXPOSED INSULATION. WHERE LINING HAS BEEN INTERRUPTED, EXTERNAL INSULATION IS REQUIRED.

E. DUCT LINER SHALL BE CUT TO PROVIDE OVERLAPPED AND COMPRESSED LONGITUDINAL CORNER JOINTS. LINER SHALL BE INSTALLED WITH THE COATED SURFACE FACING THE AIR STREAM. DUCT LINER SHALL BE ADHERED TO THE DUCTWORK WITH A 100% COVERAGE OF THE SHEET METAL SURFACES USING A FIRE RETARDANT ADHESIVE APPLIED BY SPRAYING. COAT ALL EXPOSED LEADING EDGES AND ALL TRANSVERSE JOINTS WITH FIRE RETARDANT ADHESIVE. THE LINER SHALL BE ADDITIONALLY SECURED USING METAL PINS WELDED TO THE DUCT AND SPEED WASHERS. ALL LEADING EDGES SHALL BE SECURED WITH SHEET METAL AIRFOILS.

F. INSIDE THE VAPOR BARRIER OF THE BUILDING, ALL SUPPLY AIR DUCTWORK WHICH IS NOT LINED SHALL BE INSULATED. ALL SUPPLY AIR DUCTWORK WHICH IS ON THE TOP FLOOR, DOWNSTREAM OF A PIU SERVING AN EXTERIOR EXPOSURE OR IS WITHIN 25 FEET OF AN EXTERIOR DOOR SHALL BE INSULATED. ALL OUTSIDE AIR DUCTWORK SHALL BE INSULATED. INSULATION SHALL BE CUT SLIGHTLY LONGER THAN CIRCUMFERENCE OF DUCT TO ENSURE FULL THICKNESS AT CORNERS. ALL INSULATION SHALL BE APPLIED WITH EDGES TIGHTLY BONDED. INSULATION SHALL BE ADHERED TO DUCT WITH FIRE-RESISTANT ADHESIVE. ADHESIVE SHALL BE APPLIED SO THAT INSULATION CONFORMS TO DUCT SURFACES UNIFORMLY AND FIRMLY. IN ADDITION TO THE ADHESIVE, THE INSULATION SHALL BE ADDITIONALLY SECURED TO THE BOTTOM OF ALL DUCTS 18" OR WIDER BY MEANS OF WELDED PINS AND SPEED CLIPS. THE PROTRUDING END OF THE PINS SHALL BE CUT OFF FLUSH AFTER THE SPEED CLIPS HAVE BEEN APPLIED. THE VAPOR BARRIER FACING SHALL BE THOROUGHLY SEALED WITH TAPE WHERE THE PINS HAVE PIERCED THROUGH. ALL JOINTS SHALL BE SEALED WITH 2" WIDE SMACNA TAPE. ANY CUTS OR TEARS SHALL BE SEALED WITH SMACNA TAPE.

G. ALL OUTSIDE AIR DUCTWORK LOCATED IN CONDITIONED OR SEMI-CONDITIONED SPACES SHALL BE EXTERNALLY INSULATED SIMILAR TO SUPPLY DUCTWORK.

H. ALL CONDITIONED AIR DUCTWORK, INCLUDING PARTIALLY CONDITIONED ENERGY RECOVERY VENTILATOR OUTSIDE AIR SUPPLY TO THE BUILDING AND EXHAUST DUCTWORK, INSTALLED IN SPACES THAT ARE VENTILATED ONLY, I.E. PENTHOUSES, SHALL BE INSULATED.

END OF SECTION

SECTION 23 31 00

HVAC DUCTS, ACCESSORIES, AND CASINGS

1.0 GENERAL

1.01 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION IS GOVERNED BY THE COMMON WORK RESULTS FOR HVAC SECTION 23 05 00.

B. THIS SECTION 23 31 00 AND THE ACCOMPANYING DRAWINGS COVER THE PROVISIONS OF ALL LABOR, EQUIPMENT, APPLIANCES, AND MATERIALS AND PERFORMING ALL OPERATIONS IN CONNECTION WITH THE CONSTRUCTION OF THE DUCTWORK SYSTEMS AS SPECIFIED HEREIN AND AS SHOWN. THESE SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

1. SUPPLY AIR DUCTWORK
2. RETURN, TRANSFER, AND RELIEF AIR DUCTWORK
3. EXHAUST DUCTWORK
4. OUTSIDE AIR DUCTWORK
5. DUCTWORK ACCESSORIES

C. C. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.

1.02 INTENT

A. IT IS THE INTENT OF THIS SECTION OF THE SPECIFICATIONS TO PROVIDE A COMPLETE OPERABLE DUCT SYSTEM AS SHOWN AND SPECIFIED WHICH IS REASONABLY AIRTIGHT, FREE OF NOISE, VIBRATION, AND SWEATING, AND FABRICATED SO AS TO FIT INTO THE SPACE ALLOTTED AND TO EXHIBIT A MINIMUM RESISTANCE TO AIRFLOW.

1.03 DESIGN AND CONSTRUCTION — DUCTWORK

A. DUCTWORK SHALL BE PROVIDED IN STRICT ACCORDANCE WITH THE THIRD EDITION — 2005 — OF THE SMACNA HVAC DUCT CONSTRUCTION STANDARDS — METAL AND FLEXIBLE, NFPA NO. 90A, 90B, 91 AND 96, AND UL 181. WHERE SMACNA TABLES HAVE AN OPTION BETWEEN DIFFERENT GAUGES AND SUPPORTS, THE HEAVIER GAUGE SHALL BE USED.

B. DUCTWORK DIMENSIONS SHOWN ARE NET, CLEAR, INSIDE DIMENSIONS WITH NO ALLOWANCE SHOWN FOR DUCT LINER. ALL DUCTWORK SPECIFIED TO BE LINED SHALL BE 2" LARGER THAN SHOWN IN EACH DIMENSION TO COMPENSATE FOR THE LINER. DUCTWORK SHALL BE SQUARE, RECTANGULAR, ROUND, SPIRAL, OR FLAT OVAL AS NOTED. CONVERSION OF DUCT SHAPES AND SIZES SHOWN SHALL BE ACCOMPLISHED WITHOUT INCREASING AIR VELOCITIES OR FRICTION LOSSES AND IS SUBJECT TO PRIOR APPROVAL BY THE ARCHITECT AND ENGINEER.

C. ELBOWS SHALL BE EITHER FULL RADIUS TYPE (INSIDE RADIUS EQUAL TO DUCT WIDTH), FIVE-CORE RADIUSED FLAT-OVAL TYPE OR, IN LOW-PRESSURE SYSTEMS ONLY, MITERED WITH DOUBLE-THICKNESS TURNING VANES.

D. ABRUPT CHANGES IN DUCT SIZES AND SHAPES SHALL NOT BE PERMITTED. THE TOTAL ANGLE OF DIVERGING TRANSITIONS SHALL BE NOT MORE THAN 15 DEGREES; CONVERGING TRANSITIONS SHALL BE NOT MORE THAN 30 DEGREES UNLESS OTHERWISE NOTED OR REQUIRED DUE TO STRUCTURAL CONSTRAINTS.

E. OFFSETS, TRANSITIONS, RISES, AND DROPS ARE NOT INDIVIDUALLY DETAILED ON THE DESIGN DRAWINGS. THEY SHALL BE PROVIDED AS REQUIRED TO FIT THE DUCTWORK INTO THE ALLOCATED SPACES.

F. TRANSITION RECTANGULAR DUCTWORK ON BOTTOM AND SIDES. MAINTAIN TOP OF DUCTWORK LEVEL AND AS HIGH AS POSSIBLE.

G. "MEDIUM PRESSURE DUCTWORK" SHALL BE CONSTRUCTED FOR 3" WC STATIC PRESSURE CLASS AT 4000 FPM VELOCITY WITH CLASS A SEALS. APPLICATIONS SHALL INCLUDE:

1. ALL SUPPLY AIR DUCTWORK BETWEEN THE PACKAGED ROOFTOP UNIT AND THE TERMINAL UNITS
2. ALL DUCTWORK BETWEEN CENTRAL VENTILATION FANS (SUCH AS OUTSIDE AIR, TOILET EXHAUST, PRESSURE RELIEF, ENERGY RECOVERY UNITS, 100% OUTDOOR AIR UNITS) AND THEIR TERMINAL UNITS.
3. ALL DUCTWORK IN SYSTEMS SUBJECT TO MORE THAN 1" WC.

H. ALL OTHER DUCTWORK SHALL BE CONSTRUCTED FOR STANDARD 1" WC STATIC PRESSURE CLASS AT 2500 FPM WITH CLASS C SEALS AND IS HEREIN DEFINED AS "LOW-PRESSURE DUCTWORK".

I. PROVIDE THE FOLLOWING TYPES OF DUCTWORK MATERIAL FOR THE SERVICES INDICATED:

1. GALVANIZED SHEET METAL: SUPPLY, RETURN, EXHAUST, AND RELIEF OF CONDITIONED AND OUTSIDE AIR

2.0 PRODUCTS

2.01 GALVANIZED SHEETMETAL

A. GALVANIZED SHEET METAL SHALL BE LOCK-FORMING GRADE G90—ASTM A 525 HOT DIP GALVANIZED STEEL SHEETS. SHEET METAL SHALL BE GALVANIZED ON EACH SIDE WITH NOT LESS THAN 1.25 OUNCES OF ZINC PER SQUARE FOOT.

B. GALVANIZED SHEET METAL INSTALLED OUTSIDE THE BUILDING AND SUBJECT TO WEATHER SHALL BE SOLDERED OR WELDED. SEE SECTION 23 07 13 FOR ADDITIONAL INFORMATION ABOUT COVERING AND INSULATION.

C. GALVANIZED SHEET METAL INSTALLED OUTSIDE THE BUILDING AND NOT EXPOSED TO WEATHER, SUCH AS IN COVERED LOADING DOCKS AND PARKING DECKS, MAY MATCH THE CONSTRUCTION OF DUCTWORK INSIDE THE BUILDING.

D. GALVANIZED SHEET METAL DUCTWORK OUTSIDE THE BUILDING WITHIN 20 MILES OF THE SEACOAST SHALL HAVE CORROSION COATING APPROPRIATE TO THE INSTALLATION LOCATION.

2.02 SPIRAL DUCT

A. SPIRAL DUCT SHALL BE UTILIZED FOR ALL FLAT-OVAL AND ROUND DUCTWORK IN MEDIUM AND HIGH-PRESSURE SYSTEMS.

B. SPIRAL DUCT SHALL BE THE PRODUCT OF UNITED MCGILL CORPORATION, R.V. MONEY, EASTERN SHEET METAL, OR AN APPROVED EQUAL.

C. SPIRAL DUCT WITH INTERNAL RIBS IS NOT ACCEPTABLE.

D. SPIRAL DUCT SHALL CONFORM TO SMACNA 2005 STANDARDS. LIGHTER GAUGES, ETC., DUE TO STANDING RIBS, ARE NOT ACCEPTABLE.

2.03 DOUBLE-WALL DUCTWORK

A. SEE SECTION 23 07 13 FOR INSULATION. INSULATION SHALL BE SANDWICHED BETWEEN TWO (2) LAYERS OF SHEET METAL IN ACCORDANCE WITH SMACNA STANDARDS. ALL JOINTS SHALL BE PERMANENTLY SEALED AIRTIGHT.

2.08 DAMPERS

A. MANUAL VOLUME DAMPERS:

1. SINGLE BLADE BUTTERFLY DAMPERS ARE ACCEPTABLE UP TO 12" ROUND OR 12" X 12" SQUARE. DAMPERS LARGER THAN THESE DIMENSIONS SHALL BE MULTI-BLADE TYPE. SINGLE BLADE DAMPERS SHALL BE CONSTRUCTED OF 16 GAUGE OR HEAVIER GALVANIZED SHEET METAL.

2. NO MULTI-BLADE DAMPER BLADE SHALL EXCEED 8" IN WIDTH. ALL MULTIPLE BLADE DAMPERS SHALL BE CONSTRUCTED OF 16 GAUGE GALVANIZED STEEL OR HEAVIER. THE DAMPER FRAME SHALL BE 16 GAUGE OR HEAVIER. THE DAMPER ACTION SHALL BE OPPOSED-BLADE TYPE.

3. EACH BLADE SHALL PIVOT ON A 1/2" CADMIUM-PLATED, COLD-ROLLED STEEL AXLE WHICH PIVOTS WITHIN SELF-LUBRICATING, OILITE BRONZE BEARINGS.

4. THE TOP AND BOTTOM EDGES OF EACH RECTANGULAR DAMPER BLADE SHALL BE CRIMPED FOR STIFFNESS.

5. THE OPERATING ROD FOR ALL DAMPERS SHALL BE EXTENDED OUTSIDE THE DAMPER FRAME FOR ATTACHMENT OF AN OPERATOR. EACH OPERATOR SHALL HAVE A POSITION INDICATOR AND LOCKING QUADRANT.

6. ALL DAMPERS UTILIZED FOR THE INTRODUCTION OF OUTSIDE AIR SHALL HAVE FLEXIBLE, GASKETED EDGE AND END SEALS. THE LEAKAGE RATE SHALL BE LESS THAN 4 CFM PER SF OF FACE AREA AGAINST A 1" WC DIFFERENTIAL PRESSURE, BASED ON A NOMINAL 48" X 48" DAMPER SIZE.

7. ALL DAMPERS UTILIZED FOR EXHAUST OR RELIEF AIR SHALL HAVE FLEXIBLE, GASKETED EDGE AND END SEALS. THE LEAKAGE RATE SHALL BE LESS THAN 4 CFM PER SF OF FACE AREA AGAINST A 1" WC DIFFERENTIAL PRESSURE, BASED ON A NOMINAL 48" X 48" DAMPER SIZE.

8. DAMPERS TO BE INSTALLED IN INSULATED DUCTWORK SHALL HAVE STANDOFFS SUFFICIENT TO ALLOW FOR INSULATION AND VAPOR BARRIER INTEGRITY.

9. MANUAL VOLUME DAMPERS SHALL BE AS MANUFACTURED BY LOUVERS & DAMPERS, INC., POTTORFF, GREENHECK, NAILOR, RUSKIN, OR AN APPROVED EQUAL.

B. CONTROL DAMPERS:
1. CONTROL DAMPERS SHALL BE OF THE SAME CONSTRUCTION AS MANUAL VOLUME DAMPERS, EXCEPT THAT NO MANUAL OPERATOR AND QUADRANT ARE REQUIRED. THE OPERATING ROD SHALL BE SUITABLE FOR OPERATION BY AN AUTOMATIC PNEUMATIC OR ELECTRIC OPERATOR.

F. BACKDRAFT DAMPERS:

1. BACKDRAFT DAMPERS SHALL BE SIZED ACCORDING TO THEIR INSTALLATION LOCATION AND NOTED PRESSURE SETTING. DAMPER PRESSURE SETTING SHALL BE ADJUSTABLE AND SHALL BE ACCESSIBLE FROM OUTSIDE DUCTWORK OR VIA ACCESS HATCH, AS APPLICABLE.

2.09 LOW-PRESSURE DUCT BRANCHES:
A. SPLITTER DAMPERS SHALL BE PROVIDED AT ALL LOW-PRESSURE DUCTWORK BRANCHES. ALL LOW-PRESSURE DUCTWORK BRANCHES SHALL BE RADIUSED OR 45-DEGREE TAKE-OFFS; STRAIGHT TOPS ARE UNACCEPTABLE. THE LENGTH OF THE DAMPER BLADE SHALL BE THE SAME AS THE WIDTH OF THE WIDEST DUCT SECTION AT THE SPLIT, BUT IN NO CASE SHALL BLADE LENGTH BE LESS THAN 12". EACH OPERATOR ROD SHALL HAVE A LOCKING SWIVEL JOINT.

2.10 FLEXIBLE DUCT:
A. FLEXIBLE DUCTWORK SHALL BE CLASS 1, UL 181 AIR DUCT AND MEET NFPA 90A AND 90B STANDARDS.

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B. THE INTERNAL DUCT SURFACE SHALL BE ACOUSTICALLY RATED, BLACK CPE BONDED TO A COATED STEEL WIRE HELIX. THE EXTERNAL JACKET SHALL BE A FIBERGLASS, BI-DIRECTIONALLY REINFORCED, METALLIZED VAPOR BARRIER WITH A STANDING, TRIPLE-PLY SEAM. FIBERGLASS INSULATION SHALL BE PROVIDED BETWEEN THE DUCT SURFACE AND THE JACKET TO ACHIEVE A MAXIMUM THERMAL CONDUCTANCE OF 0.24 BTU/HR./SQ. FT./°F AT 75°F MEAN.

C. FLEXIBLE DUCTWORK SHALL BE SUITABLE FOR 10" W.G. POSITIVE PRESSURE AND 1" W.G. NEGATIVE PRESSURE IN SIZES 4" THROUGH 12" ID, AND 6" W.G. POSITIVE PRESSURE AND 0.5" W.G. NEGATIVE PRESSURE IN SIZES 14—16" ID.

D. FLEXIBLE DUCTWORK, INSULATION, AND INSULATION COVER SHALL BE SUITABLE FOR CEILING RETURN AIR PLENUM INSTALLATION AND SHALL COMPLY WITH ALL APPLICABLE CODES AND STANDARDS REGARDING SUCH CEILING PLENUM INSTALLATIONS.

E. FLEXIBLE DUCT SHALL BE THERMAFLEX M— KE OR AN APPROVED EQUAL.

F. THE MAXIMUM ALLOWABLE INSTALLED LENGTH OF FLEXIBLE DUCTWORK SHALL BE AS FOLLOWS:

1. 5'—0" ON SUPPLY AIR SYSTEMS LIMITED TO THE RUNOUTS FROM THE SHEETMETAL DUCTWORK TO EACH TERMINAL UNIT.

2. 2'—0" ON CONNECTIONS FROM ROUND NECK GRILLES TO SHEETMETAL DUCTWORK ON RETURN, EXHAUST AND TRANSFER DUCTWORK.

G. PROVIDE A SPIN—IN FITTING WITH INTEGRAL SCOOP AND VOLUME DAMPER AT ALL FLEXIBLE RUN—OUT CONNECTIONS IN LOW—PRESSURE SUPPLY AIR DUCTWORK ONLY, EXCEPT LOCATIONS WHERE SPIN—IN FITTINGS WOULD PROJECT MORE THAN 50A INTO THE PROJECTING DUCTWORK DIMENSION. ADHESIVE FITTINGS ARE ACCEPTABLE PROVIDED THEY ARE ALSO SCREWED TO THE DUCTWORK AND SEALED WITH MASTIC.

H. FLEXIBLE DUCTWORK SHALL NOT PASS THROUGH WALL, FLOORS, OR CEILINGS.

1. THE INLET SIZE OF THE TERMINAL UNIT OR VVT VALVE

2. THE RUNOUT SIZE INDICATED ON THE DRAWINGS

D. ALL LOW PRESSURE DUCTWORK DOWNSTREAM OF VAV UNITS SHALL BE LEFT UNCAPPED FOR BALANCING UNTIL TENANT FIT—UP AFFECTS THE UNITS.

E. ALL INTERSECTIONS (CROSSING) OF LOW—PRESSURE AND MEDIUM—PRESSURE DUCTWORK SHALL BE MADE WITH OFFSETS IN THE LOW—PRESSURE DUCTWORK ONLY. THE MEDIUM PRESSURE DUCTWORK SHALL BE RUN STRAIGHT AND LEVEL.

F. ELECTRIC DUCT HEATERS SHALL BE INSTALLED AS INDICATED AND IN CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. COORDINATE THE ACTUAL UNITS TO BE PROVIDED WITH ALL TRADES. THE HEATER SHALL BE TESTED AND ADJUSTED AFTER INSTALLATION TO PROVIDE THE CAPACITIES INDICATED.

G. DUCTWORK LABELS, INCLUDING FACTORY LABELS, TAGS, ETC. EXCEPT EQUIPMENT NAMEPLATES SHALL BE REMOVED TO THE SATISFACTION OF THE ARCHITECT IN ALL EXPOSED AREAS.

END OF SECTION

SECTION 23 34 00
HVAC FANS

DIRECT DRIVE PREMIUM CEILING MOUNTED CENTRIFUGAL EXHAUST FANS - GREENHECK MODEL SP-A

A. GENERAL DESCRIPTION:
1. BASE FAN PERFORMANCE AT STANDARD CONDITIONS (DENSITY 0.075 LB/FT3)
2. CEILING MOUNTED APPLICATIONS
3. PERFORMANCE CAPABILITIES UP TO 1,600 CUBIC FEET PER MINUTE (CFM) AND STATIC PRESSURE TO 0.75 INCHES OF WATER GAUGE
4. FANS ARE AVAILABLE IN NINETEEN SIZES (50 - 1550 UNIT SIZES)
5. MAXIMUM OPERATING TEMPERATURE IS 130 FAHRENHEIT (54.4 CELSIUS)
6. SOUND LEVELS AS LOW AS 0.7 AMCA SONESSOUND LEVELS AS LOW AS <0.3 AMCA SONES
7. UL/CUL LISTED FOR ABOVE BATHTUB EXHAUST
8. FANS ARE UL/CUL LISTED 507 - ELECTRIC FANS
9. EACH FAN SHALL BEAR A PERMANENTLY AFFIXED MANUFACTURER'S NAMEPLATE CONTAINING THE MODEL NUMBER AND INDIVIDUAL SERIAL NUMBER

B. WHEEL:
1. FORWARD CURVED CENTRIFUGAL WHEEL
2. CONSTRUCTED OF GALVANIZED STEEL OR CALCIUM CARBONATE FILLED POLYPROPYLENE
3. STATICALLY AND DYNAMICALLY BALANCED IN ACCORDANCE TO AMCA STANDARD 204-05

C. MOTORS:
1. AC INDUCTION MOTOR
   a. MOTOR ENCLOSURES: TOTALLY ENCLOSED AIR OVER: (TEAO)- DESIGNED TO BE USED SOLELY IN THE AIRSTREAM, CONSTRUCTED WITH A DUST TIGHT COVER AND A AERODYNAMIC BODY WHICH REPLIES UPON THE STRONG AIRFLOW OF THE FAN TO COOL THE MOTOR, NOT SUITABLE FOR HAZARDOUS ENVIRONMENTS.
   b. MOTORS SHALL BE PERMANENTLY LUBRICATED SLEEVE BEARING TYPE TO MATCH WITH THE FAN LOAD AND FURNISHED AT THE SPECIFIC VOLTAGE AND PHASE.
   c. MOTOR SHALL BE MOUNTED ON VIBRATION ISOLATORS AND BE ACCESSIBLE FOR MAINTENANCE
   d. THERMAL OVERLOAD PROTECTION

D. HOUSING:
1. CONSTRUCTED OF HEAVY GAUGE GALVANIZED STEEL
2. INTERIOR SHALL BE LINED WITH 0.5 INCHES OF ACOUSTICAL INSULATION
3. PROFILE AS LOW AS 10 1/2 INCHES

E. SPRING LOADED ALUMINUM BACKDRAFT DAMPER:
1. PREVENTS AIR FROM ENTERING BACK INTO THE BUILDING WHEN FAN IS OFF
2. ELIMINATES RATTLING OR UNWANTED BACKDRAFTS

F. OUTLET:
1. TYPE OF OUTLET: ROUND
2. FIELD ROTATABLE FROM HORIZONTAL TO VERTICAL DISCHARGE
3. SHALL INCLUDE AN ALUMINUM BACKDRAFT DAMPER

G. EXTERNAL ELECTRICAL ACCESSORIES:
1. ELIMINATES REMOVING THE MOTOR PACK WHICH SAVES TIME ON INSTALLATION

H. MOUNTING BRACKETS:
1. FULLY ADJUSTABLE FOR MULTIPLE INSTALLATION CONDITIONS

END OF SECTION 23 34 00

SECTION 23 37 13

DIFFUSERS, REGISTERS, AND GRILLES

1.0 GENERAL

1.01 DESCRIPTION

A. ALL WORK SPECIFIED IN THIS SECTION IS GOVERNED BY THE COMMON WORK RESULTS FOR HVAC SECTION 23 05 00. B. THIS SECTION 23 37 13 AND THE

E ACCOMPANYING DRAWINGS COVER THE PROVISIONS OF ALL LABOR, EQUIPMENT, APPLIANCES AND MATERIALS, AND PERFORMING ALL OPERATIONS IN CONNECTION WITH THE CONSTRUCTION AND INSTALLATION OF AIR DISTRIBUTION DEVICES AS SPECIFIED HEREIN AND AS SHOWN. THESE UNITS INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

1. CEILING DIFFUSERS (CD)
2. RETURN AIR GRILLES (RG)
3. LINEAR SUPPLY DIFFUSER (LD)
4. LINEAR RETURN DIFFUSER (LD)
3. SUPPLY AIR GRILLES (SG)
4. EXHAUST AIR GRILLE (EG)

A. IT IS THE INTENT OF THIS SECTION OF THE SPECIFICATIONS TO PROVIDE COMPLETE, OPERABLE, ADJUSTED AIR DISTRIBUTION DEVICES AS SHOWN AND SPECIFIED WHICH ARE FREE OF EXCESSIVE NOISE, VIBRATION AND AIRFLOW FLUCTUATIONS.

1.03 SELECTION CRITERIA

A. ALL AIR DISTRIBUTION DEVICES SHALL BE SELECTED IN ACCORDANCE WITH THE FOLLOWING MINIMUM CRITERIA UNLESS OTHERWISE NOTED BELOW OR ON THE DRAWINGS:

1. METHOD OF MOUNTING SHALL BE COMPATIBLE WITH THE CEILING, WALL OR DUCT SURFACE WHICH IT MOUNTS ON OR IN; I.E. LAY-IN, SURFACE MOUNTING, PLASTER FRAME, DUCT COLLAR, ETC. THE ARCHITECTURAL DRAWINGS SHALL BE REFERENCED TO DETERMINE THE MOUNTING METHOD FOR EACH DEVICE. ALL FLANGES ON SURFACE MOUNTED DEVICES SHALL BE PROVIDED WITH A GASKET.

2. FINISH OF ALL CEILING MOUNTED DEVICES SHALL BE SELECTED TO MATCH THE COLOR OF THE ADJACENT CEILING. FINISH OF ALL WALL MOUNTED DEVICES SHALL BE PRIMER WHICH IS COMPATIBLE WITH THE FINISH COATING SPECIFIED FOR THE ADJACENT WALL; FINISH COAT WILL BE APPLIED UNDER DIVISION 9.

1.04 BASIS OF DESIGN

A. THE BASIS OF DESIGN IS TITUS. ANY PROPOSED SUBSTITUTIONS SHALL BE PROVEN EQUAL IN ALL RESPECTS TO THE EQUIPMENT SPECIFIED AS THE BASIS OF DESIGN. ANY MODIFICATIONS TO DUCTWORK, CONTROLS, CEILINGS, BUILDING STRUCTURE, ETC., THAT RESULT FROM ANY SUBSTITUTION SHALL BE COORDINATED WITH ALL TRADES.

THIS COORDINATION SHALL OCCUR BEFORE DELIVERY OF EQUIPMENT AND ANY MODIFICATIONS SHALL BE PERFORMED WITHOUT INCURRING ADDITIONS TO THE CONTRACT.

1.05 ACCEPTABLE MANUFACTURERS

A. ACCEPTABLE MANUFACTURERS ARE PRICE, CARNES, METAL AIRE, KRUEGER, NAILOR, AND TITUS, UON, PROVIDED THAT THEIR UNITS, PERFORMANCE, APPEARANCE AND PHYSICAL CHARACTERISTICS ARE EQUAL IN ALL RESPECTS FOR THIS SPECIFIC PROJECT.

THERMOSTATIC CONTROL NOTES:

A. THERMOSTATIC CONTROLS FOR EACH ZONE. THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH SPACE-CONDITIONING ZONE OR DWELLING UNIT SHALL BE CONTROLLED BY AN INDIVIDUAL THERMOSTATIC CONTROL THAT RESPONDS TO TEMPERATURE WITHIN THE ZONE AND THAT MEETS THE APPLICABLE REQUIREMENTS OF SECTION 120.2(b). AN ENERGY MANAGEMENT CONTROL SYSTEM (EMCS) MAY BE INSTALLED TO COMPLY WITH THE REQUIREMENTS OF ONE OR MORE THERMOSTATIC CONTROLS IF IT COMPLIES WITH ALL APPLICABLE REQUIREMENTS FOR EACH THERMOSTATIC CONTROL.

EXCEPTION TO SECTION 120.2(a): AN INDEPENDENT PERIMETER HEATING OR COOLING SYSTEM MAY SERVE MORE THAN ONE ZONE WITHOUT INDIVIDUAL THERMOSTATIC CONTROLS IF:

1. ALL ZONES ARE ALSO SERVED BY AN INTERIOR COOLING SYSTEM; AND
2. THE PERIMETER SYSTEM IS DESIGNED SOLELY TO OFFSET ENVELOPE HEAT LOSSES OR GAINS; AND
3. THE PERIMETER SYSTEM HAS AT LEAST ONE THERMOSTATIC CONTROL FOR EACH BUILDING ORIENTATION OF 50FEET OR MORE; AND
4. THE PERIMETER SYSTEM IS CONTROLLED BY AT LEAST ONE THERMOSTAT LOCATED IN ONE OF THE ZONES SERVED BY THE SYSTEM.

B. SHUT-OFF AND RESET CONTROLS FOR SPACE-CONDITIONING SYSTEMS. EACH SPACE-CONDITIONING SYSTEM SHALL BE INSTALLED WITH CONTROLS THAT COMPLY WITH THE FOLLOWING:

1. THE CONTROL SHALL BE CAPABLE OF AUTOMATICALLY SHUTTING OFF THE SYSTEM DURING PERIODS OF NON-USE AND SHALL HAVE:
A. AN AUTOMATIC TIME SWITCH CONTROL DEVICE COMPLYING WITH SECTION 110.9(c), WITH AN ACCESSIBLE MANUAL OVERRIDE THAT ALLOWS OPERATION OF THE SYSTEM FOR UP TO 4 HOURS; OR
B. AN OCCUPANCY SENSOR; OR
C. 4-HOUR TIMER THAT CAN BE MANUALLY OPERATED.

EXCEPTION TO SECTION 120.2(e)1: MECHANICAL SYSTEMS SERVING RETAIL STORES AND ASSOCIATED MALLS, RESTAURANTS, GROCERY STORES, CHURCHES, AND THEATERS EQUIPPED WITH 7-DAY PROGRAMMABLE TIMERS.

2. THE CONTROL SHALL AUTOMATICALLY RESTART AND TEMPORARILY OPERATE THE SYSTEM AS REQUIRED TO MAINTAIN:
A. A SETBACK HEATING THERMOSTAT SET POINT IF THE SYSTEM PROVIDES MECHANICAL HEATING .AND EXCEPTION TO SECTION 120.2(e)2A: THERMOSTAT SETBACK CONTROLS ARE NOT REQUIRED IN NONRESIDENTIAL BUEDINGS IN AREAS WHERE THE WINTER MEDIAN OF EXTREMES OUTDOOR AIR TEMPERATURE DETERMINED IN ACCORDANCE WITH SECTION 140.4(b)3 IS GREATER THAN 32°F.

B. A SETUP COOLING THERMOSTAT SET POINT IF THE SYSTEM PROVIDES MECHANICAL COOLING.

EXCEPTION TO SECTION 120.2(e)2B: THERMOSTAT SETUP CONTROLS ARE NOT REQUIRED IN NON-RESIDENTIAL BUILDINGS IN AREAS WHERE THE SUMMER DESIGN DRY BULB 0.5 PERCENT TEMPERATURE DETERMINED IN ACCORDANCE WITH SECTION 140.4(b)3 IS LESS THAN 100°F.

C. DAMPERS FOR AIR SUPPLY AND EXHAUST EQUIPMENT. OUTDOOR AIR SUPPLY AND EXHAUST EQUIPMENT SHALL BE INSTALLED WITH DAMPERS THAT AUTOMATICALLY CLOSE UPON FAN SHUTDOWN.

EXCEPTION 1 TO SECTION 120.2(f): EQUIPMENT THAT SERVES AN AREA THAT MUST OPERATE CONTINUOUSLY.
EXCEPTION 2 TO SECTION 120.2(f): GRAVITY AND OTHER NON-ELECTRICAL EQUIPMENT THAT HAS READILY ACCESSIBLE MANUAL DAMPER CONTROLS.
EXCEPTION 3 TO SECTION 120.2(f): AT COMBUSTION AIR INTAKE AND SHAFT VENTS.
EXCEPTION 4 TO SECTION 120.2(f): WHERE PROHIBITED BY OTHER PROVISIONS OF LAW.

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TITLE:
MECHANICAL SPECIFICATIONS (3 OF 3)

SHEET NUMBER:
M-302

CERTIFICATE OF COMPLIANCE	NRCC-MCH-E
This document is used to demonstrate compliance for mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.4, or 141.0(b)2 for alterations.	
Project Name: L'occitane_Santa Rosa_CA	**Report Page:** (Page 1 of 9)
Project Address:	**Date Prepared:** 2025-08-26T11:23:49-04:00

A. GENERAL INFORMATION

01	Project Location (city)	Montgomery village 911 village courtspace #C7 Santa rosa, CA	04 Total Conditioned Floor Area	935
02	Climate Zone	2	05 Total Unconditioned Floor Area	0
03	Occupancy Types Within Project:		06 # of Stories (Habitable Above Grade)	1

● Office

B. PROJECT SCOPE

This table Includes mechanical systems or components that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.4, 170.2(b) or 141.0(b)2 and 180.2(b)2 for alterations.

01 Air System(s)	02 Wet System Components	03 Dry System Components
☐ Heating Air System	☐ Water Economizer	☐ Air Economizer
☐ Cooling Air System	☐ Pumps	☐ Electric Resistance Heat
Mechanical Controls	☐ System Piping	☒ Fan Systems
☐ Mechanical Controls (existing to remain, altered or new)	☐ Cooling Towers	☒ Ductwork (existing to remain, altered or new)
	☐ Chillers	☒ Ventilation
	☐ Boilers	☐ Zonal Systems/ Terminal Boxes

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C. COMPLIANCE RESULTS

Table C will indicate if the project data input into the compliance document is compliant with mechanical requirements. This table is not editable by the user. If this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D., or the table indicated as not compliant for guidance.

01		02		03		04		05		06		07		08	09
System Summary 110.1, 110.2, 140.4, 170.2(c)	AND	Pumps 140.4(k), 170.2(c)4I	AND	Fans/ Economizers 140.4(c), 140.4(e), 170.2(c)	AND	System Controls 110.2, 120.2, 140.4(f), 170.2(c)	AND	Ventilation 120.1, 160.2	AND	Terminal Box Controls 140.4(d), 170.2(c)4B	AND	Distribution 120.3, 140.4(l), 160.2, 160.3	AND	Cooling Towers 110.2(e)2	Compliance Results
(See Table F)		(See Table G)		(See Table H)		(See Table I)		(See Table J)		(See Table K)		(See Table L)		(See Table M)	
	AND		AND	Yes	AND		AND	Yes	AND		AND	Yes	AND		COMPLIES with Exceptional Conditions
Mandatory Measures Compliance (See Table Q for Details)										COMPLIES					

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

The permit applicant has indicated on Table J that ventilation calculations have been attached or included elsewhere on the plans.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)

This section does not apply to this project.

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G. PUMPS

This section does not apply to this project.

H. FAN SYSTEMS & AIR ECONOMIZERS

This table is used to demonstrate compliance with prescriptive requirements found in 140.4(c), 140.4(e), 140.4(m), 170.2(c)3, and 170.2(c)4A for fan systems. Fan systems serving only process loads are exempt from these requirements and do not need to be included in Table H.

System Name	(E)FCU-1	Quantity	1	Fan System Status	Alteration	System Zoning	all other systems	Serving Dwelling Units	Not Serving Dwelling Units	Fan System Airflow (cfm)	1,600	Site Elevation	164	Economizer	NA: Altered other than packaged AC or HP <54 kBtu/h
01	02	03	04			05		06	07	08	09			10	11
									Allowance		Design				
Fan Name or Item Tag	Fan Type	Qty	Component			Airflow through Component (%)		Water Gauge (w.g)	Component Allowance (watt/cfm)	Fan Allowance (watt/cfm)[1]	Design Electrical Input Power Method		Motor Nameplate Horsepower		Fan Electrical input Power (kW)
(N)EF-1	Exhaust	1	None used							0	Default per Table 140.4-D/141.0-D Variable Speed Drive		<1		0.89
Supply Fan Base Allowance (watt/cfm)			Exhaust/Return/Relief/Transfer Fan Base Allowance(watt/cfm)							Fan System Allowance (kW)[1]			Fan System Electrical Input Power (kW)		0.89

[1] FOOTNOTES: Fans serving spaces with design background noise goals below NC35
[2] Low-turndown single-zone VAV fan system must be capable of and configured to reduce airflow to 50 percent of design airflow and use no more than 30 percent of the design wattage at that airflow. No more than 10 percent of the design load served by the equipment shall have fixed loads.
[3] Fan system allowance includes fan system base allowance.
[4] Filter pressure loss can only be counted once per fan system.
[5] Complex Fan System means a fan system that combines a single cabinet fan system with other supply fans, exhaust fans, or both.

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H. FAN SYSTEMS & AIR ECONOMIZERS

[6] Computer room economizers must meet requirements of 140.9(a) and will be documented on the NRCC-PRC-E document..

H. EXHAUST AIR HEAT RECOVERY 140.4(q), 170.2(c)4O

01	02	03	04	05	06	07	08	09	10	11
Fan System Name	Qty	Hours of Operation per Year	Design Supply Airflow Rate	Outdoor Airflow	% Outdoor Air at Full Design Airflow	Exemptions to Exhaust Air Heat Recovery Requirement per 140.4(q) & 170.2(c)4O	Exhaust Air Heat Recovery 140.4(q) & 170.2(c)4O	Type Of Heat Recovery Rating	Required Recovery Ratio	Energy Recovery Bypass
(E)FCU-1	1	< 8,000	1,600	150	9	NA: Serving space not cooled and heated to <60 F	Not Required			

Fan Energy Index (FEI)

01	02	03
Name or Item Tag	FEI Exception	FEI
(E)FCU-1	Altered Fan System	

I. SYSTEM CONTROLS

This section does not apply to this project.

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J. VENTILATION AND INDOOR AIR QUALITY

This table is used to demonstrate compliance with mandatory ventilation requirements in 120.1 120.2(e)3B 140.4(p) and 140.4(q) for all nonresidential and hotel/motel and d:t24refnolink/]160.2, 160.3(a)3D, 170.2(a)4N, 170.2(a)4O for high-rise residential occupancies. For alterations, only ventilation systems being altered within the scope of the permit application need to be documented in this table. In lieu of this table, the required outdoor ventilation rates and airflows may be shown on the plans or the calculations can be presented in a spreadsheet.

01	☒	Check the box if the project is showing ventilation calculations on the plans, or attaching the calculations instead of completing this table.
02	☐	Check this box if the project included Nonresidential, Hotel/Motel Spaces or Multifamily Common Use Spaces
	☐	
03	☐	Check the box if the project is using natural ventilation in any nonresidential or hotel/motel spaces to meet required ventilation rates per 120.1(c)2.

K. TERMINAL BOX CONTROLS

This section does not apply to this project.

L. DISTRIBUTION (DUCTWORK and PIPING)

This table is used to show compliance with mandatory pipe insulation requirements found in 120.3 and mandatory requirements found in 120.4(g) for duct sealing.

01	☐	Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather shall be installed with a cover suitable for outdoor service. Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space shall have a Class I or Class II vapor retarder. All penetrations and joints of which shall be sealed.

Duct Leakage Testing

The answers to the questions below apply to the following duct systems:	Supply air duct, return air air plenum, outside air duct & Exhaust air duct.	**NR/ Common Use:** Duct leakage testing shall not exceed 15% per NA7.5.3 required for these systems?	No
		Dwelling Units: Total duct leakage of duct system shall not exceed 15% or duct system to outside shall not exceed 10% per RA3.1.4 required for systems?	---
		Duct leakage testing per CMC Section 603.9.2 required for these systems?	Yes

CERTIFICATE OF COMPLIANCE	NRCC-MCH-E
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L. DISTRIBUTION (DUCTWORK and PIPING)

11	No	The scope of the project includes only duct systems serving healthcare facilities
12	Yes	Duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system.
13	Yes	The space conditioning system serves less than 5,000 ft² of conditioned floor area.
14	No	The combined surface area of the ducts is more than 25% of the total surface area of the entire duct system:
15	No	The scope of the project includes extending an existing duct system, which is constructed, insulated or sealed with asbestos.
16	No	The scope of the project includes an existing duct system that is documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in the Reference Nonresidential Appendix NA2.
17	Exposed Ductwork located in occupied space	All Ductwork and plenums with pressure class ratings shall be constructed to Seal Class A
18	No	All ductwork is an extension of an existing duct system
19	No	Ductwork serving individual dwelling unit
20		< 25 ft of new or replacement space conditioning ducts installed
21	R-8	Duct Insulation R-value
22	No	Ductwork Existing To Remain
23	Yes	Duct System Connected To Altered Space Conditioning System

M. COOLING TOWERS

This section does not apply to this project.

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N. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency-4

Form/Title
NRCI-MCH-01-E - Must be submitted for all buildings

O. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency-4

Form/Title	Systems/Spaces To Be Field Verified
NRCA-MCH-02-A - Outdoor Air must be submitted for all newly installed HVAC units. Note: MCH-02-A can be performed in conjunction with MCH-07-A	
Supply Fan VFD Acceptance (if applicable) since testing activities overlap.	

P. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION

There are no NRCV forms required for this project.

CERTIFICATE OF COMPLIANCE	NRCC-MCH-E
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Q. MANDATORY MEASURES DOCUMENTATION LOCATION

This table is used to indicate where mandatory measures are documented in the plan set or construction documentation.

01		02
Compliance with Mandatory Measures documented through MCH Mandatory Measures Note Block	No	Plan sheet or construction document location
03		04
Mandatory Measure		**Plan sheet or construction document location**
Duct Insulation per 120.4		R8
The air duct and plenum system is designed per 120.4(a)-(f)		Sheet M-100, Mechanical plan
Kitchen range hoods shall be rated for sound in accordance with Section 7.2 of ASHRAE 62.2		NA

CERTIFICATE OF COMPLIANCE	NRCC-MCH-E
Project Name: L'occitane_Santa Rosa_CA	**Report Page:** (Page 9 of 9)
Project Address:	**Date Prepared:** 2025-08-26T11:23:49-04:00

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Michael Tobias	Documentation Author Signature:
Company: NY Engineers	Signature Date:
Address: 382 NE 191 ST Street Suite 49674	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: Miami, FL 33179	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

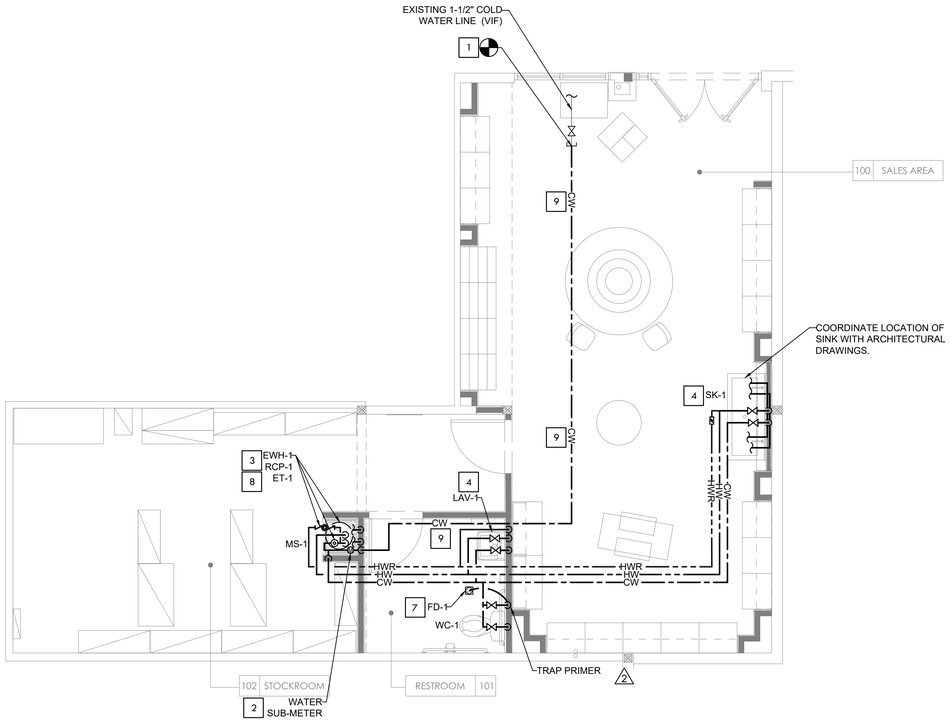
Responsible Designer Name: Michael Tobias	Responsible Designer Signature:
Company: NY Engineers	Date Signed:
Address: 382 NE 191 ST Street Suite 49674	License:
City/State/Zip: Miami, FL 33179	Phone:

Property of CLIY Engineers

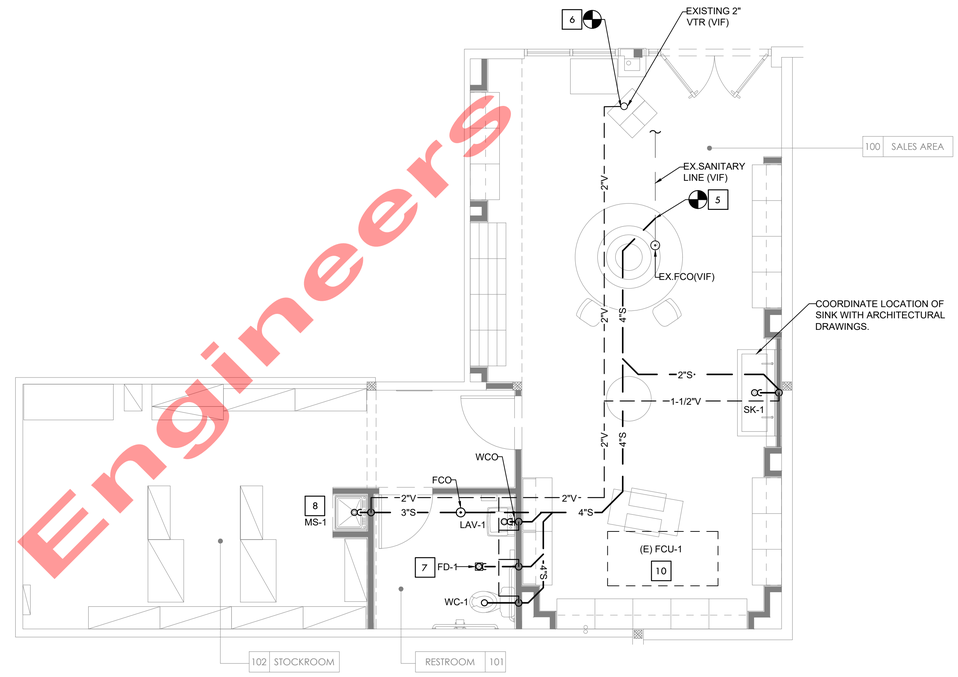
L'OCCITANE
EN PROVENCE

TITLE:
ENERGY CODE ANALYSIS - (TITLE 24)

SHEET NUMBER:
M-400



1 WATER SUPPLY FLOOR PLAN
1/4" = 1'-0"



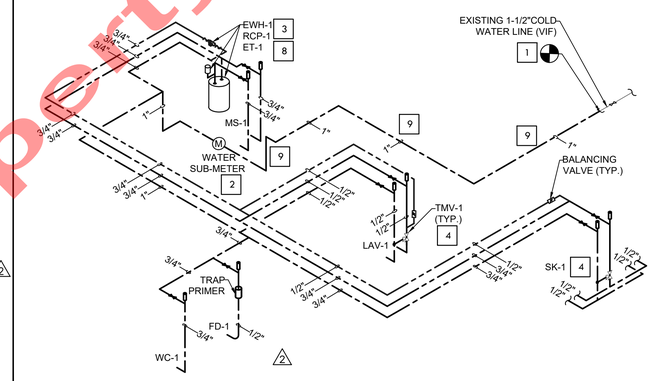
2 SANITARY AND VENT FLOOR PLAN
1/4" = 1'-0"

GENERAL NOTES

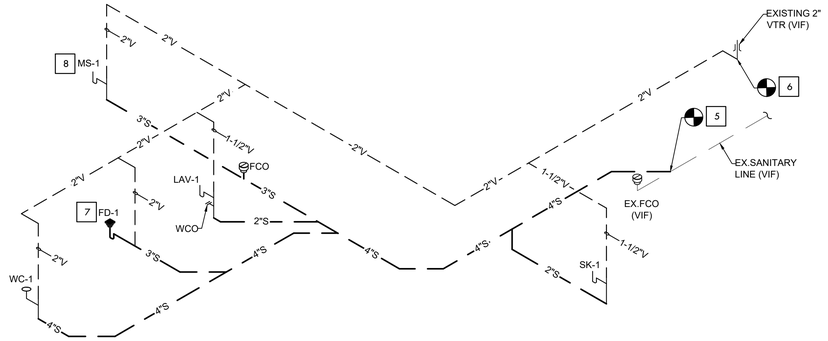
1. ANY CHANGES AND/ OR UPGRADES TO TENANT'S EXISTING PLUMBING SYSTEMS SHALL COMPLY WITH ALL LOCAL CODES. EXISTING SYSTEMS SHALL POSSESS THE CAPACITY TO HANDLE ANY AND ALL CHANGES IN LOAD.
2. ANY UNUSED PLUMBING EQUIPMENT, PIPING, ETC., WITHIN OR SERVING THE PREMISES MUST BE COMPLETELY REMOVED TO POINT OF ORIGIN. DO NOT ABANDON IN PLACE.
3. INSPECT AND TEST ALL EXISTING SANITARY SEWER LINES AND WATER LINES. REPAIR AND/OR REPLACE AS REQUIRED. SNAKE-OUT EXISTING SANITARY AND WATER LINE.
3. ALL FLOOR DRAINS ARE REQUIRED TO HAVE TRAP PRIMERS.
4. IF NOT ALREADY EXISTING, INSTALL A SHUT OFF VALVE ON DOMESTIC WATER LINE INSIDE SPACE.
5. ALL PLUMBING SHUTOFF VALVE SHALL BE COORDINATED WITH MECHANICAL EQUIPMENT AND SHALL BE EASILY ACCESSIBLE EASILY ACCESSED FOR FUTURE OPERATION.
6. NO ROOF PENETRATIONS PERMITTED WITHIN ROOF WATER PLY, REFER TO ROOF PLAN FOR LOCATIONS.
7. CONTRACTOR SHALL FIELD VERIFY SLAB ON GRADE FLOOR CONSTRUCTION TYPE PRIOR TO CUTTING. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR CUT A STRUCTURAL FLOOR SLAB THICKER THAN FOUR (4") INCHES WITHOUT PRIOR WRITTEN APPROVAL FROM ENGINEER OF RECORD. NOTIFY ENGINEER OF RECORD OF ANY SLAB THICKNESS GREATER THAN FOUR (4") INCHES PRIOR TO PROCEEDING WITH ANY SAW CUTTING.
8. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION AND PROPER INSTALLATION OF ALL PLUMBING SYSTEMS.
9. THE CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL ETC. FOR THE PROPER INSTALLATION OF ALL PLUMBING SYSTEMS.
10. PIPING SHALL NOT BE LOCATED IN ELECTRICAL ROOMS OR OVER THE TOP OF ANY ELECTRICAL PANELS OR EQUIPMENT.

PLUMBING KEYED NOTES:

1. EXTEND AND CONNECT NEW 1" CW LINE TO 1-1/2" EXISTING COLD WATER LINE STUB-IN FOR THE SPACE. CONTRACTOR TO FIELD VERIFY EXISTING COLD WATER STUB-IN LINE LOCATION AND SIZE.
2. CONTRACTOR TO COORDINATE WITH LANDLORD/AHJ REQUIREMENT OF WATER SUB-METER. PROVIDE WATER SUB-METER AS SHOWN ON THE PLAN IF REQUIRED. INSTALLED WATER SUB-METER AS PER LOCAL AHJ. BASE BID ACCORDINGLY.
3. PROVIDE NEW STORAGE TANK TYPE ELECTRIC WATER HEATER (EWH-1) WITH RCP-1 AND ET-1, INCLUDING ALL ASSOCIATED ACCESSORIES AND FITTINGS. INSTALL WATER HEATER ABOVE MOP SINK, REFER PLUMBING FIXTURE SCHEDULE ON SHEET #P-202.
4. PROVIDE APPROVED ASSE 1070 THERMOSTATIC MIXING VALVE SET TO 110°F AT LAVATORY AND SINK.
5. EXTEND AND CONNECT NEW 4" SANITARY PIPING TO THE EXISTING SANITARY LINE IN THE SPACE CONTRACTOR SHALL VERIFY THE EXISTING SANITARY LINE PIPE SIZE, LOCATION, INVERT, DIRECTION OF FLOW & TIE-IN CONNECTION PRIOR TO BID.
6. EXTEND AND CONNECT NEW 2" VENT LINE TO EXISTING VENT THROUGH ROOF IN THE SPACE. CONTRACTOR TO FIELD VERIFY EXISTING VTR LOCATION AND SIZE PRIOR TO BID. UPGRADE SIZE IF REQUIRED.
7. PROVIDE TRAP PRIMER FOR FLOOR DRAIN (FD-1). REFER TO THE DETAIL #2 "FLOOR DRAIN WITH TRAP PRIMER PIPING DETAIL" ON SHEET #P-202.
8. ROUTE T AND P INDIRECT WASTE FROM WATER HEATER (EWH-1) TO MOP SINK (MS-1) WITH APPROVED AIR GAP.
9. NO TAP OFF TO BE TAKEN BEFORE WATER SUB-METER.
10. EXISTING (E) FCU TO REMAIN WITH EXISTING CONDENSATE DRAIN PIPE CONNECTIONS, ACCESSORIES AND FITTINGS IN THE EXISTING LOCATION. CONTRACTOR TO VERIFY IN FIELD EXACT LOCATION OF EXISTING PIPING & CHECK SAME TO BE IN WORKING CONDITION. IF THE EXISTING CONDENSATE DRAIN LINE IS NOT PROVIDED OR NOT TO BE IN GOOD CONDITION PROVIDE NEW CONDENSATE DRAIN LINE AND CONNECT IT TO THE MOP SINK (MS-1) WITH AN APPROVED AIR GAP. BASE BID ACCORDINGLY.



3 WATER SUPPLY RISER DIAGRAM
N.T.S



4 SANITARY AND VENT RISER DIAGRAM
N.T.S

Property of NY Engineers

L'OCCITANE
EN PROVENCE

TITLE:
PLUMBING FLOOR PLAN, NOTES AND RISER DIAGRAM

SHEET NUMBER:
P-100

PLUMBING SPECIFICATION

SECTION 200500 GENERAL REQUIREMENTS

A. GENERAL

1. SPECIFICATIONS ARE APPLICABLE TO ALL CONTRACTORS AND/OR SUBCONTRACTORS FOR ALL PLUMBING SYSTEMS IN DIVISION 01 & 22.

2. CONTRACTOR IS ALSO REFERRED TO THE ARCHITECTURAL, STRUCTURAL, ELECTRICAL AND ALL OTHER DRAWINGS AND SPECIFICATIONS PERTINENT TO THIS PROJECT AND FULLY COORDINATE WITH ALL OTHER TRADES, OWNER AND ARCHITECT REQUIREMENTS. ALL OF THE ABOVE MENTIONED DRAWINGS AND SPECIFICATIONS ARE CONSIDERED A PART OF THE CONTRACT DOCUMENTS.

3. CONFORM TO ALL INSTRUCTIONS TO BIDDERS, GENERAL AND SPECIAL CONDITIONS OF CONTRACT AS SPECIFIED BY ARCHITECT AND/OR OWNER.

4. REFER TO "ALTERNATE PROPOSALS" FOR POSSIBLE CHANGES AFFECTING THE EXTENT OF THIS SECTION OF WORK.

5. BEFORE SUBMITTING A BID, EACH CONTRACTOR IS REQUESTED TO VISIT THE JOB SITE TO FAMILIARIZE THEMSELVES WITH CONSTRUCTION CONDITION, CHECK FACILITIES AND CONDITIONS AND MAKE ALL NECESSARY OBSERVATIONS AND MEASUREMENTS. NOTE CONDITIONS UNDER WHICH WORK IS TO BE PERFORMED AND TAKE ALL ITEMS INTO CONSIDERATION IN BID. NO CONSIDERATION WILL BE GIVEN FOR HIS FAILURE TO DO SO.

6. SYSTEMS ARE TO BE COMPLETE AND WORKABLE IN ALL RESPECTS, PLACED IN OPERATION AND PROPERLY ADJUSTED.

7. EACH CONTRACTOR SHALL PROVIDE FOR HIS OWN CLEAN-UP, REMOVAL AND LEGAL DISPOSAL OF ALL RUBBISH DAILY.

8. EACH CONTRACTOR SHALL PROTECT HIS WORK, HIS EXISTING AND ADJACENT PROPERTY AGAINST WEATHER.

9. EACH CONTRACTOR SHALL PROTECT HIS WORK, MATERIALS, APPARATUS AND FIXTURES FROM DAMAGE. ANY WORK DAMAGED BY FAILURE TO PROVIDE PROTECTION REQUIRED, SHALL BE REMOVED AND REPLACED WITH NEW MATERIAL AT THE CONTRACTOR'S EXPENSE.

10. EACH CONTRACTOR MUST CONFIRM ALL UTILITY COMPANY REQUIREMENTS AND CONNECTION POINTS IN FIELD, PRIOR TO STARTING WORK. EACH CONTRACTOR SHALL INCLUDE COST OF UTILITY COMPANIES WORK IN THEIR BID.

11. EACH CONTRACTOR MUST CONFIRM SIZE, LOCATION AND MATERIALS AT POINT OF TIE IN CONNECTIONS IN THE FIELD PRIOR TO ROUGH-IN OF NEW WORK.

12. ARRANGE FOR AND OBTAIN OWNER'S AND INSURANCE REPRESENTATIVE'S PERMISSION FOR ANY SERVICE SHUTDOWNS.

13. EACH CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, SEQUENCES OF CONSTRUCTION AND THE SAFETY OF WORKMEN.

14. NO PIPING, DUCTWORK, WIRING, ETC., SHALL BE INSTALLED OR ROUTED ABOVE OR BELOW ELECTRICAL PANELS AND EQUIPMENT, OR STAIRWAYS UNLESS THESE ITEMS SERVE THESE AREAS ONLY.

15. ALL CONTRACTORS SHALL COORDINATE WITH THE ELECTRICAL CONTRACTOR AND OBTAIN A WRITTEN APPROVAL IDENTIFYING THE ELECTRICAL CHARACTERISTICS OF ALL PLUMBING EQUIPMENT PRIOR TO ORDERING OF EQUIPMENT. NO ADDITIONAL PAYMENT WILL BE MADE FOR LACK OF CONTRACTOR COORDINATION OF ELECTRICAL CHARACTERISTICS.

16. EACH CONTRACTOR SHALL INCLUDE MODIFYING EXISTING CONDITIONS TO COMPLETE THE PROJECT. DURING CONSTRUCTION THE CONTRACTORS MAY UNCOVER AN EXISTING CONDITION THAT WILL HAVE TO BE MODIFIED. ANY SUCH WORK WHICH COMES UNDER THE JURISDICTION OF THIS CONTRACTOR SHALL BE DONE BY THIS CONTRACTOR WITHOUT EXTRA COST TO THE OWNER AND PROJECT.

17. WORK RELATED TO THE EXISTING BUILDING SHALL BE COORDINATED TO MINIMIZE INTERFERENCE OR INTERRUPTION OF NORMAL BUILDING USE BY THE OWNER. REFER TO ARCHITECTURAL PLANS FOR PHASING REQUIREMENTS.

18. CEILING GRID SYSTEMS SHALL NOT BE SUPPORTED FROM PLUMBING LINES OR ANY OTHER UTILITY LINES, AND VICE VERSA. EACH UTILITY AND THE CEILING GRID SYSTEM SHALL BE A SEPARATE INSTALLATION AND EACH SHALL BE INDEPENDENTLY SUPPORTED FROM THE BUILDING STRUCTURE - CONCRETE, STEEL OR MASONRY. WHERE INTERFERENCES OCCUR, IN ORDER TO SUPPORT PIPING, CEILING GRID SYSTEMS, ETC.

B. WORK COORDINATION AND SCOPE

1. EACH CONTRACTOR UNDER THIS DIVISION SHALL FAMILIARIZE HIMSELF WITH THE WORK TO BE DONE UNDER OTHER DIVISIONS OF THIS SPECIFICATION AND THEIR RELATED DRAWINGS AND SHALL SO COORDINATE AND SCHEDULE HIS WORK AS NOT TO CAUSE DELAYS OR INTERFERENCE WITH THE WORK OF OTHERS. SUCH COORDINATION AND SCHEDULING SHALL ACCOMPLISH THE INSTALLATION OF MECHANICAL AND PLUMBING EQUIPMENT AND PIPING WITH A MINIMUM OF CUTTING THROUGH MASONRY AND OTHER ADJUSTMENTS.

2. WORK INCLUDED UNDER THIS DIVISION SHALL CONSIST OF FURNISHING ALL MATERIALS, SUPPLIES, EQUIPMENT, TOOLS, TRANSPORTATION AND FACILITIES AND PERFORMING ALL LABOR AND SERVICES NECESSARY FOR THE COMPLETE INSTALLATION OF THE MECHANICAL SYSTEMS OF PLUMBING, FIRE PROTECTION, HEATING, VENTILATING, AIR CONDITIONING, AND SPECIALTY SYSTEMS.

3. THE CONTRACTOR UNDER THIS DIVISION SHALL REPORT DISCREPANCIES IN THE WORK OF OTHERS WHICH AFFECT HIS WORK. ANY CHANGES MADE NECESSARY BY FAILURE OR NEGLECT TO REPORT SUCH DISCREPANCIES SHALL BE MADE BY AND AT THE EXPENSE OF THE CONTRACTOR OF THIS DIVISION. OBTAIN WRITTEN INSTRUCTIONS FOR CHANGES NECESSARY TO ACCOMMODATE WORK OF OTHERS.

4. THE CONTRACTOR UNDER THIS DIVISION SHALL BE RESPONSIBLE FOR PROPER SIZE AND LOCATION OF ANCHORS, CHASES, RECESSES, OPENING, ETC., REQUIRED FOR THE PROPER INSTALLATION OF HIS WORK.

5. THE DIVISION OF RESPONSIBILITY UNDER SEPARATE FIRE PROTECTION AND PLUMBING CONTRACTS FOR TIE-IN POINTS SHALL BE AS FOLLOWS:

A. THE PLUMBING CONTRACTOR SHALL PROVIDE DOMESTIC WATER TO WITHIN FIVE FEET (5'-0") OF EQUIPMENT CONNECTION FURNISHED BY THE MECHANICAL OR ELECTRICAL CONTRACTOR, FINAL CONNECTION BY MECHANICAL OR ELECTRICAL CONTRACTOR. ON THE WATER LINES, THE PLUMBING CONTRACTOR SHALL PROVIDE THE SHUT-OFF VALVE, CHECK VALVE, BACKFLOW PREVENTOR AND PRESSURE REGULATOR. ON THE GAS LINES, THE PLUMBING CONTRACTOR SHALL PROVIDE THE SHUT-OFF VALVE AND PRESSURE REGULATOR.
B. PLUMBING CONTRACTOR SHALL RUN THE WATER AND SANITARY TO POINTS AS NOTED ON THE DRAWINGS.
C. FIRE PROTECTION AND PLUMBING CONTRACTOR SHALL PROVIDE SLEEVES TO THE GENERAL CONTRACTOR FOR PLACEMENT IN FLOORS, WALLS, ETC. AND COORDINATE SUCH LOCATION. THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR FLASHING AT VENT ROOF TERMINALS.
D. THE FIRE PROTECTION AND PLUMBING CONTRACTOR SHALL CHECK WITH THE ARCHITECTURAL DRAWINGS CONCERNING THE TEST BORINGS TO DETERMINE AREAS OF ROCK WHICH SHOULD BE INCLUDED IN HIS EXCAVATION WORK. FAILURE TO ADJUST FOR ROCK CONDITIONS SHALL NOT WARRANT CAUSE FOR ADDITIONAL COMPENSATION.
E. THE PLUMBING CONTRACTOR SHALL ROUGH-IN AND CONNECT ALL OTHER FIXTURES AND EQUIPMENT WHERE SHOWN E. ON THE DRAWINGS BUT NOT PREVIOUSLY MENTIONED. PROVIDE WITH SHUT-OFF VALVES AND P-TRAPS WITH CLEAN-OUT PLUG.
F. UNLESS RESPONSIBILITY TO PROVIDE OR FURNISH IS OTHERWISE STATED ON THE ELECTRICAL OR MECHANICAL DRAWINGS AND ELECTRICAL AND MECHANICAL SPECIFICATIONS THE CONTRACTOR, UNDER THESE DIVISIONS SHALL PROVIDE MOTORS, SPECIAL CONTROLS, DISCONNECTS, TRANSFORMERS, STARTERS AND RELAYS AS REQUIRED FOR THE PROPER OPERATIONS OF ALL EQUIPMENT FURNISHED UNDER THIS DIVISION. ALL ELECTRICAL EQUIPMENT SHALL CONFORM TO REQUIREMENTS SET FORTH UNDER THE ELECTRICAL DIVISION AND BE SUITABLE FOR OPERATION ON 60 CYCLE CURRENT AVAILABLE AT THE SITE.

C. CODES, PERMITS, STANDARDS AND REGULATIONS

1. CONTRACTORS SHALL INSTALL WORK IN FULL ACCORDANCE WITH RULES AND REGULATIONS OF ALL APPLICABLE CODES (LOCAL,CITY, COUNTY, STATE, NATIONAL CODES, NFPA, OSHA, ETC.), GOVERNMENT REGULATIONS, UTILITY COMPANY REQUIREMENTS, AND APPLICABLE STANDARDS HAVING JURISDICTION OVER PREMISES. THIS SHALL INCLUDE SAFETY REQUIREMENTS OF THE STATE DEPARTMENT. DO NOT CONSTRUE THIS AS RELIEVING CONTRACTOR FROM COMPLIANCE WITH ANY REQUIREMENTS OF SPECIFICATIONS WHICH ARE IN EXCESS OF CODE REQUIREMENTS AND NOT IN CONFLICT THEREWITH.

2. CONTRACTORS SHALL SECURE AND PAY FOR ALL FEES, PERMITS, AND CERTIFICATES OF INSPECTION INCIDENTAL TO THIS WORK REQUIRED BY FOREGOING AUTHORITIES. ARRANGE FOR ALL REQUIRED INSPECTIONS AND APPROVALS.

3. CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENTS TO ALL PUBLIC UTILITIES FOR WORK PERFORMED BY THEM IN CONNECTION WITH PROVISION OF SERVICE CONNECTIONS REQUIRED UNDER THIS DIVISION OF SPECIFICATIONS.

4. DELIVER ALL PERMITS AND CERTIFICATES TO ARCHITECT IN DUPLICATE.

D. DESIGN DRAWINGS

1. THE DESIGN DRAWINGS, AS SUBMITTED, ARE DIAGRAMMATIC AND ARE NOT INTENDED TO SHOW EXACT LOCATION OF EQUIPMENTAND PIPING UNLESS DIMENSIONS ARE GIVEN. PIPING ARE TO BE INSTALLED ALONG THE GENERAL PLANS SHOWN ON THE DRAWINGS WHILE CONFORMING TO ACTUAL BUILDING CONDITIONS. EACH CONTRACTOR SHALL CONFIRM ALL DIMENSIONS BY FIELD MEASUREMENT.

2. BEFORE ENTERING INTO A CONTRACT, THE SUCCESSFUL BIDDER MAY BE REQUIRED TO SUBMIT SATISFACTORY EVIDENCE TO SHOW THAT THE MANUFACTURER OF ALL PARTS OF THE EQUIPMENT OFFERED HAVE BEEN REGULARLY ENGAGED IN THE MANUFACTURE OF SUCH EQUIPMENT FOR THREE (3) YEARS AND HAVE NOT LESS THAN THREE (3) INSTALLATIONS OF A SIMILAR TYPE WHICH HAVE BEEN IN SUCCESSFUL OPERATION UNDER CONDITIONS SIMILAR TO THOSE SPECIFIED FOR NOT LESS THAN TWO (2) YEARS.

3. ALL EQUIPMENT, PIPING AND MATERIAL SPECIFIED HEREIN AFTER AS SHOWN ON THE DRAWINGS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR, UNLESS SPECIFICALLY INDICATED TO THE CONTRARY. INSTALLATION SHALL COMPLY WITH ALL REQUIRED "BUILDING CODES" AND "REFERENCE STANDARDS."

4. IF THIS CONTRACTOR PROPOSES TO INSTALL EQUIPMENT REQUIRING SPACE CONDITIONS OTHER THAN THOSE AS SPECIFIED AND/OR SHOWN ON THE DESIGN DRAWINGS, OR TO REARRANGE THE EQUIPMENT, HE SHALL ASSUME FULL RESPONSIBILITY AND SUBMIT DRAWINGS FOR THE REARRANGEMENT OF THE SPACE AND SHALL OBTAIN THE FULL APPROVAL OF THE ARCHITECT PRIOR TO START OF ANY WORK.

5. THE EXACT LOCATIONS FOR FIXTURES, EQUIPMENT AND PIPING WHICH IS NOT COVERED BY DRAWINGS SHALL BE OBTAINED FROM THE ARCHITECT OR HIS REPRESENTATIVE IN THE FIELD AND THE WORK SHALL BE LAID OUT ACCORDINGLY.

6. DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT ONE ANOTHER. ANY MATERIALS OR LABOR CALLED FOR IN ONE BUT NOT THE OTHER SHALL BE FURNISHED AS IF BOTH WERE MENTIONED IN THE SPECIFICATIONS AND SHOWN ON THE DRAWINGS.

E. BASE BID EQUIPMENT, MATERIALS AND SUBSTITUTIONS

1. ALL EQUIPMENT AND MATERIALS SHALL BE NEW, FREE OF DEFECTS AND UL LABELED.

2. BASE BID MANUFACTURERS ARE INCLUDED IN THE SPECIFICATION OR LISTED IN SCHEDULES ON THE DRAWINGS. ALL OTHER MANUFACTURERS ARE CONSIDERED SUBSTITUTION.

3. THE NAME OR MAKE OF ANY ARTICLE, DEVICE, MATERIAL, FORM OF CONSTRUCTION, FIXTURE, ETC., STATED IN THIS SPECIFICATION, WHETHER OR NOT THE WORDS "OR APPROVED EQUAL" ARE USED, SHALL BE KNOWN AS A "STANDARD".

4. ALL COST SHALL BE BASED ON "STANDARDS" SPECIFIED.

5. THE EQUIPMENT SCHEDULES ON THE DRAWINGS INDICATE MANUFACTURER AND THEIR EQUIPMENT MODEL NUMBERS THAT THIS DESIGN HAS BEEN BASED ON. EACH CONTRACTOR IS REQUIRED TO BID UPON THE BASIS OF DESIGN AND FURNISH THE MAKES SPECIFIED.

6. WHERE MORE THAN ONE MAKE OR NAME IS MENTIONED AS BEING ACCEPTABLE, IT SHALL BE UNDERSTOOD THAT ONLY THE NAME OR MAKE REFERRING TO THE MANUFACTURERS MODEL NUMBERS OR SIZES SHALL BE CONSIDERED THE "SPECIFIED STANDARDS." IT SHALL BE FURTHER UNDERSTOOD THAT OTHER MAKES AND NAMES, EVEN THOUGH MENTIONED, HAVE NOT BEEN CHECKED FOR DETAIL AND THAT THEIR SIZE AND ARRANGEMENT ARE THE CONTRACTOR'S RESPONSIBILITY THE SAME AS A PROPOSED SUBSTITUTE ITEM. THE USE OF OTHER MANUFACTURER'S EQUIPMENT THAT IS LISTED AS ACCEPTABLE ALTERNATES THAT ENTAILS GENERAL TRADES, STRUCTURAL, MECHANICAL, ELECTRICAL, ETC., REVISIONS IS THIS CONTRACTOR'S RESPONSIBILITY TO PROVIDE REVISIONS. ANY ADDITIONAL COST OF SUCH CHANGES SHALL BE PAID BY THE CONTRACTOR SUBMITTING THE ACCEPTABLE ALTERNATES WHICH NECESSITATES CHANGES IN INSTALLING SUCH SUBMITTED ALTERNATE EQUIPMENT, EVEN THOUGH SUCH COSTS MAY BE PART OF ANOTHER DIVISION OF WORK.

7. BIDS CONCERNING THE USE OF SUBSTITUTE PRODUCTS MUST BE ACCOMPANIED BY COMPLETE SPECIFICATIONS AND PERFORMANCE CHARACTERISTIC COVERING THESE PRODUCTS. CONTRACTOR SHALL PROVIDE ALL AVAILABLE TEST DATA AND EXPERIENCE RECORDS WHICH MAY BE HELPFUL TO THE ARCHITECT IN EVALUATING THE QUALITY AND/OR SUITABILITY OF ALTERNATE PRODUCTS.

8. CONTRACTOR IS ALSO INVITED TO BID ON ANY OTHER SIMILAR PRODUCTS THE CONTRACTOR DESIRES TO PROPOSE AS SUBSTITUTIONS, STATING ANY DIFFERENCE IN COST (ADD OR DEDUCT FROM BASE BID COST) FOR EACH PROPOSED SUBSTITUTION ON THE SUBSTITUTION SHEET. IF THE ARCHITECT DECIDES TO ACCEPT ANY OF THE PROPOSED SUBSTITUTIONS, PROPER NOTATIONS THEREOF SHALL BE MADE IN THE WRITTEN CONTRACT. WHERE SEVERAL MAKES ARE MENTIONED IN THE SPECIFICATIONS AND THE CONTRACTOR FAILS TO STATE THAT HE PREFERS A PARTICULAR MAKE IN HIS BID, THE OWNER SHALL HAVE THE RIGHT TO CHOOSE ANY OF THE MAKES MENTIONED WITHOUT CHANGE IN PRICE. NO CONSIDERATION WILL BE GIVEN TO PROPOSALS FOR ALTERNATIVE PRODUCTS UNLESS SUBMITTED WITH THE ORIGINAL BIDS.

9. SUBSTITUTIONS ARE SUBJECT TO THE APPROVAL OF THE OWNER. IF A SUBSTITUTION IS SUBMITTED, IT IS THE CONTRACTOR'S RESPONSIBILITY TO EVALUATE IT AND CERTIFY THAT THE SUBSTITUTION IS EQUIVALENT IN ALL RESPECTS TO THE BASE SPECIFICATIONS.

10. IF SUBSTITUTIONS ARE APPROVED, NOTIFY ALL OTHER CONTRACTORS, SUBCONTRACTORS, ETC., AFFECTED BY THE SUBSTITUTION AND FULLY COORDINATE WITH THEM. ANY COSTS RESULTING FROM SUBSTITUTION, WHETHER BY THIS CONTRACTOR OR OTHERS, SHALL BE THE RESPONSIBILITY OF AND PAID FOR BY THE SUBSTITUTING CONTRACTOR. APPROVED SHOP DRAWINGS DO NOT ABSOLVE THIS CONTRACTOR FROM THIS RESPONSIBILITY.

11. ALL EQUIPMENT SHALL BE INSTALLED IN FULL ACCORDANCE WITH THE MANUFACTURER'S DATA AND INSTALLATION INSTRUCTIONS AND SERVICE CLEARANCES. IT IS THIS CONTRACTOR'S RESPONSIBILITY TO CHECK AND CONFIRM THESE REQUIREMENTS PRIOR TO STARTING OF ANY WORK.

F. WARRANTY

1. FULLY WARRANT ALL MATERIALS, EQUIPMENT AND WORKMANSHIP AND THE SUCCESSFUL OPERATION OF ALL EQUIPMENT AND APPARATUS INSTALLED BY THIS CONTRACTOR FOR ONE (1) YEAR FROM DATE OF FINAL ACCEPTANCE.

2. REPAIR OR REPLACE WITHOUT MATERIAL AND LABOR CHARGE TO THE OWNER ALL ITEMS FOUND DEFECTIVE DURING THE WARRANTY PERIODS. IN THE CASE OF REPLACEMENT OR REPAIR DUE TO FAILURE WITHIN THE WARRANTY PERIOD, THE WARRANTY ON THAT PORTION OF THE WORK SHALL BE EXTENDED FOR A MINIMUM PERIOD OF ONE (1) YEAR FROM THE DATE OF SUCH REPLACEMENT OR REPAIR.

G. SHOP DRAWING SUBMITTALS

1. SUBMIT SHOP DRAWINGS FOR PLUMBING, FIRE PROTECTION, AND CONTROL SYSTEMS; INCLUDING BUT NOT LIMITED TO SHEETMETAL, PLUMBING FIXTURES AND EQUIPMENT WITH ADEQUATE DETAILS AND SCALES TO CLEARLY SHOW CONSTRUCTION. INDICATE THE OPERATING CHARACTERISTICS FOR EACH REQUIRED ITEM. CLEARLY IDENTIFY EACH ITEM ON THE SUBMITTAL AS TO MARK, LOCATION AND USE, USING THE SAME IDENTIFICATION AS PROVIDED ON THE CONSTRUCTION DOCUMENTS.

2. SHEETMETAL AND FIRE PROTECTION SHOP DRAWINGS SHALL BE FULLY DIMENSIONED AND COORDINATED BASED ON FIELD VERIFIED BUILDING DIMENSIONS AND CLEARANCES AND ARCHITECTURAL CEILING LAYOUTS. INDICATE STRUCTURAL SYSTEMS, LIGHTING AND PIPING AT ALL CRITICAL LOCATIONS.

3. CONTRACTOR SHALL REVIEW AND INDICATE HIS APPROVAL OF EACH SHOP DRAWING PRIOR TO SUBMITTAL FOR REVIEW. SHOP DRAWINGS WILL NOT BE REVIEWED BY THE ENGINEER UNLESS THE CONTRACTOR'S APPROVAL IS NOTED. DO NOT START WORK OR FABRICATION UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED BY THE ENGINEER AND RETURNED TO THE CONTRACTOR.

4. SUBMITTALS WILL BE REVIEWED ONLY FOR GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS AND NOT FOR DIMENSIONS OR QUANTITIES. THE ARCHITECT AND ENGINEER WILL MAKE EVERY EFFORT TO DETECT AND CORRECT ERRORS, OMISSIONS, AND INACCURACIES IN SUCH DRAWINGS, BUT THE FAILURE TO DETECT ERRORS, OMISSIONS, AND INACCURACIES SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR THE PROPER AND COMPLETE INSTALLATION IN ACCORDANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS. THE SUBMITTAL REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PURCHASE OF ANY ITEM IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS OR ITS COMPLETE AND PROPER INSTALLATION.

5. WHERE SUBMITTALS VARY FROM THE CONTRACT REQUIREMENTS, THE CONTRACTOR SHALL CLEARLY INDICATE ON SUBMITTAL OR ACCOMPANYING DOCUMENTS THE NATURE AND REASON FOR THE VARIATIONS.

6. EACH MANUFACTURER OR HIS REPRESENTATIVE MUST CHECK THE APPLICATION OF HIS EQUIPMENT AND CERTIFY AT TIME OF SHOP DRAWING SUBMITTAL THAT THE EQUIPMENT SPECIFIED HAS BEEN PROPERLY APPLIED AND CAN BE INSTALLED, SERVICED AND MAINTAINED WHERE INDICATED ON THE DRAWINGS. ADVISE ENGINEER IN WRITING WITH SUBMITTAL DRAWINGS OF ANY POTENTIAL PROBLEMS. THE MANUFACTURER SHALL BE RESPONSIBLE FOR ANY CHANGES THAT MIGHT BE NECESSARY BECAUSE OF PHYSICAL CHARACTERISTICS OF EQUIPMENT THAT HAVE NOT BEEN CALLED TO THE ENGINEER'S ATTENTION AT THE TIME OF SUBMITTAL.

7. SUBMIT A MINIMUM OF ONE (1) PRINT AND AN ELECTRONIC "PDF" OF SHOP DRAWINGS TO THE ARCHITECT. THE ARCHITECT AND ENGINEER SHALL REVIEW AND RETURN A PDF. THE CONTRACTOR SHALL DISTRIBUTE COPIES AS REQUIRED TO PROPERLY CONDUCT THWORK, INCLUDING REQUIREMENTS OF THE OPERATING MANUAL.

H. RECORD DRAWINGS

1. EACH CONTRACTOR OR SUBCONTRACTOR SHALL KEEP ONE (1) COMPLETE SET OF THE CONTRACT DRAWINGS AND EQUIPMENT SUBMITTALS ON THE JOB SITE ON WHICH HE SHALL REGULARLY RECORD ANY DEVIATIONS OR CHANGES FROM SUCH CONTRACT DRAWINGS MADE DURING CONSTRUCTION. ALL RECORDING SHALL BE DONE IN COLOR INK.

2. THESE DRAWINGS SHALL RECORD THE INSTALLED LOCATION OF ALL CONCEALED EQUIPMENT, PIPING, ELECTRIC SERVICE, SEWERS, WASTES, VENTS, DUCTS, CONDUIT, ETC., BY MEASURE DIMENSIONS TO EACH SUCH ITEM FROM COLUMN CENTERLINES OR READILY IDENTIFIABLE AND ACCESSIBLE WALLS OR CORNERS OF THE BUILDING. PLANS ALSO SHALL SHOW INVERT ELEVATION OF SEWERS AND TOP ELEVATION OF ALL OTHER BELOW-GRADE LINES.

3. RECORD DRAWINGS SHALL BE KEPT CLEAN AND UNDAMAGED AND SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN RECORDING DEVIATIONS FROM WORKING DRAWINGS AND EXACT LOCATIONS OF CONCEALED WORK.

4. AFTER THE PROJECT IS COMPLETED, THESE DRAWINGS SHALL BE SCANNED TO AN ELECTRONIC "PDF" FORMAT AND PDF AND HARD DRAWINGS SHALL BE DELIVERED TO THE ARCHITECT IN GOOD CONDITION, AS A PERMANENT RECORD OF THE INSTALLATION AS ACTUALLY CONSTRUCTED.

I. SUPERVISION

1. THE CONTRACTOR SHALL HAVE IN CHARGE OF WORK AT ALL TIMES DURING CONSTRUCTION A COMPETENT FOREMAN OR SUPERINTENDENT WHOSE EXPERIENCE AND BACKGROUND SHALL QUALIFY HIM FOR THE WORK TO BE PERFORMED UNDER THIS DIVISION. ONCE ASSIGNED, THE FOREMAN OR SUPERINTENDENT SHALL BE RETAINED UNTIL COMPLETION OF THE PROJECT AND ANY CONSIDERATION AS TO HIS REMOVAL ON GROUNDS OF INCOMPETENCE SHALL EITHER BE INITIATED BY OR REFERRED TO THE ARCHITECT FOR DECISION.

BASIC MATERIALS AND METHODS

A. GENERAL

1. PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, AND ACCESSORIES REQUIRED TO FURNISH AND INSTALL THE PLUMBING ITEMS IDENTIFIED IN THIS SECTION.

2. THIS SECTION INCLUDES BASIC PLUMBING MATERIALS AND METHODS TO COMPLEMENT OTHER DIVISION SECTIONS IN THIS SPECIFICATION AND REQUIREMENTS INDICATED ON THE PLUMBING DRAWINGS.

B. INTERFERENCES

1. BEFORE INSTALLING ANY WORK, CONTRACTOR SHALL SEE THAT IT DOES NOT INTERFERE WITH CLEARANCE REQUIRED FOR FINISH ON BEAMS, COLUMNS, PILASTERS, WALLS, OR OTHER STRUCTURAL OR ARCHITECTURAL MEMBERS, AS SHOWN ON ARCHITECTURAL DRAWINGS. IF ANY WORK IS SO INSTALLED AND IT LATER DEVELOPS THAT ARCHITECTURAL DESIGN CANNOT BE FOLLOWED, CONTRACTOR SHALL, AT HIS OWN EXPENSE, MAKE SUCH CHANGES IN HIS WORK AS ARCHITECT MAY DIRECT TO PERMIT COMPLETION OF ARCHITECTURAL WORK IN ACCORDANCE WITH PLANS AND SPECIFICATIONS.

2. REPORT ANY INTERFERENCES BETWEEN WORK UNDER THIS DIVISION AND THAT OF ANY OTHER CONTRACTORS TO ARCHITECT AS SOON AS THEY ARE DISCOVERED. ARCHITECT WILL DETERMINE WHICH EQUIPMENT SHALL BE RELOCATED, REGARDLESS OF WHICH WAS FIRST INSTALLED, AND HIS DECISION SHALL BE FINAL.

C. PROTECTION OF WORK AND PROPERTY

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFEGUARDING WORK, PROPERTY, AND FACILITIES AGAINST DAMAGE, BOTH HIS OWN AS WELL AS OTHERS WITH WHICH HE MAY COME INTO CONTACT IN THE PERFORMANCE OF HIS WORK.

2. STORED MATERIALS SHALL BE PROTECTED AGAINST DAMAGE FROM WEATHER. PIPE AND DUCT OPENINGS SHALL BE CLOSED WITH CAPS OR PLUGS DURING INSTALLATION. ALL FIXTURES AND EQUIPMENT SHALL BE COVERED AND PROTECTED AGAINST DAMAGE. ANY MATERIALS OR EQUIPMENT DAMAGED AT ANY STAGE IN THE CONSTRUCTION SHALL BE REPLACED OR REPAIRED. FINAL COMPLETION, ALL WORK SHALL BE IN A CLEAN AND UNBLEMISHED CONDITION.

3. DURING CONSTRUCTION, ALL RETURN AIR DUCTWORK AND TRANSFER AIR OPENINGS SERVING NEW AND EXISTING AIR HANDLING EQUIPMENT AND/OR ADJACENT TENANT SPACES SHALL BE PROTECTED. OPENINGS WHICH NEED TO REMAIN ACTIVE SHALL BE COVERED AND PROTECTED WITH MERV 8 FILTRATION MEDIA; OPENINGS WHICH CAN REMAIN INACTIVE DURING CONSTRUCTION SHALL BE COVERED WITH PLASTIC SHEATHING AND SEALED AIR TIGHT. FILTER MEDIA SHALL BE REPLACED REGULARLY AS REQUIRED DURING CONSTRUCTION IN ORDER TO ENSURE ADEQUATE AIRFLOW THROUGH ALL REQUIRED ACTIVE OPENINGS. IN ADDITION, AT THE END OF EACH PHASE OF CONSTRUCTION AND AT THE END OF THE CONSTRUCTION PROJECT, ALL FILTRATION MEDIA WITHIN EACH PIECE OF EQUIPMENT SERVING THE SPACE SHALL BE REPLACED.

D. EXCAVATION AND BACKFILL

1. PERFORM ALL EXCAVATION AND BACKFILL REQUIRED FOR INSTALLATION OF BELOW-GRADE PIPING .

2. EXCAVATE AS REQUIRED TO INSTALL PIPING AT REQUIRED DEPTH AND PITCH. PIPE TO BE LAID ON SAND BEDDING TO GIVE UNIFORM BEARING ALONG LENGTH OF PIPE (SAND INSIDE BUILDING AND INTERLOCKING AGGREGATE OUTSIDE BUILDING).

3. BACKFILL WITH BEDDING MATERIAL TO A MINIMUM OF 12" ABOVE TOP OF PIPE AND COMPACT. BALANCE OF BACKFILL IN OUTDOOR GRASS AREAS SHALL BE CLEAN EARTH UP TO 6" ABOVE SURROUNDING GRADES. BACKFILL BELOW FINISHED FLOORS SHALL BE SAND. BACKFILL OUTDOORS UNDER PAVING SHALL BE INTERLOCKING AGGREGATE AND SHALL BE COMPACTED IN MAXIMUM 10" LAYERS.

4. ALL OTHER EXCAVATIONS SHALL BE BACKFILLED WITH CLEAN EARTH, EXCLUDING RUBBISH AND BOULDERS. BACKFILL SHALL BE THOROUGHLY TAMPED AND PUDDLED.

5. PATCH FLOOR AND PAVING TO MATCH EXISTING ADJACENT SURFACES.

6. BACKFILLING SHALL NOT BE DONE UNTIL PIPE LINES ARE PROPERLY TESTED IN THE PRESENCE OF THE ARCHITECT AND/OR INSPECTION OF THE GOVERNMENT AGENCY HAVING JURISDICTION.

7. CONTROL TRENCH SOIL COMPACTION DURING CONSTRUCTION FOR COMPLIANCE WITH THE MAXIMUM DENSITY SPECIFIED FOR THE FOLLOWING AREAS:

A. BUILDING SLABS, WALKWAYS, ROADWAYS, OR PUBLIC THOROUGH-FARES; COMPACT TOP 12" OF SUBGRADE AND EACH LAYER OF BACKFILL FOR FILL MATERIAL AT 95 PERCENT DENSITY FOR COHESIONLESS SOILS, AND 90 PERCENT DENSITY FOR COHESIVE SOIL MATERIAL. TESTS TO BE PERFORMED BY AN INDEPENDENT TESTING SERVICE, WITH THE COMPLIANCE REPORT SUBMITTED TO THE ARCHITECT.

8. PIPE SHALL NOT BE LAID IN WATER. FURNISH ALL PUMPING EQUIPMENT, POWER, TEMPORARY CONNECTIONS, ETC., AND DO ALL PUMPING NECESSARY TO REMOVE GROUND OR CASUAL WATER.

9. WHERE TRENCHES CROSS ROADS, WALKS, OR PUBLIC THOROUGHFARES, PROVIDE SUITABLE BARRICADES AND BRIDGES ADEQUATELY PROTECTED BY SIGNS OR RED FLAGS DURING DAY AND LIGHTS AS NIGHT.

1. REPAVE ALL STREETS OR SIDEWALKS DISTURBED AT THIS CONTRACTOR'S EXPENSE TO RECOMMENDATIONS, PROCEDURES AND SATISFACTION OF ARCHITECT AND AUTHORITIES HAVING JURISDICTION.

E. SUPPORTS AND HANGERS

1. HANGERS AND SUPPORTS ARE TO BE PROVIDED TO PROPERLY SUPPORT, SECURE AND ALIGN PIPING AND TO MEET FIELD CONDITIONS AND AS MANUFACTURED BY GRINNELL, MICHIGAN HANGER OR CADDY.

2. ALL HANGERS, BRACKETS, CLAMPS, ETC., SHALL BE OF STANDARD WEIGHT STEEL. PERFORATED STRAP HANGERS SHALL NOT BE USED IN ANY WORK. WHEN TWO OR MORE PIPES ARE RUN PARALLEL, THEY MAY BE SUPPORTED ON UNISTRUT-TYPE TRAPEZE HANGERS. OTHER HANGERS FOR PIPE 3" IN SIZE AND SMALLER SHALL BE CLEVIS. FOR PIPE TRANSPORTING MEDIUM ABOVE 150 DEGREES F AND 4" IN SIZE AND ABOVE, USE PIPE ROLL. EACH HANGER IS TO BE SIZED TO INCLUDE PIPE INSULATION SADDLE FOR PROTECTION.

3. WHERE BUILDING SERVICE LINES ENTER OR LEAVE BUILDING SUCH AS WATER, SEWER, GAS, ETC., AND ARE INSTALLED ON FILLED EARTH, PROVIDE CONTINUOUS SUPPORT ON A REINFORCED CONCRETE BEAM FURNISHED AND INSTALLED UNDER THIS DIVISION. SUPPORT BEAM ON BUILDING AND WITH VERTICAL SUPPORT DOWN TO FOUNDATION FOOTING AND ON UNDISTURBED EARTH AT OTHER END. GAS MAIN SHALL ENTER BUILDING ABOVE GRADE.

4. ALL VERTICAL PIPING PASSING THROUGH FLOORS SHALL BE SUPPORTED AT THE FLOOR BY A RISER CLAMP.

5. ISOLATE ALL COPPER LINES FORM FERROUS HANGERS OR SUPPORTS BY USING FOIL FILLER OR VINYL TAPE.

6. PACING TO COMPLY WITH ASHRAE STANDARDS AND CODE REQUIREMENTS.

F. PIPE SLEEVES, FLOOR AND CEILING PLATES

1. ALL PIPES PASSING THROUGH FLOORS OR MASONRY WALLS SHALL BE PROVIDED WITH MACHINE-CUT SCHEDULE 40 PIPE STEEL SLEEVES. THE SLEEVES SHALL BE SO SIZED TO ALLOW AT LEAST 1/4" CLEARANCE BETWEEN THE INSIDE SLEEVE WALL AND THE PIPE OR INSULATION SURFACE. SHEET METAL SLEEVES SHALL NOT BE USED IN THIS WORK. PIPE SLEEVES ARE TO EXTEND 2" ABOVE FINISHED FLOOR AND SEALED. PIPE SLEEVES ARE TO BE FULL WALL THICKNESS AND SEALED.

2. UNUSED SLEEVES SHALL BE PLUGGED AND FINISHED TO MATCH ADJOINING SURFACE.

G. ESCUTCHEONS

1. FIT ALL PIPE PASSING THROUGH WALLS, FLOORS OR CEILINGS IN FINISHED ROOMS WITH STEEL OR BRASS ESCUTCHEONS. WHERE SURFACE IS TO RECEIVE A PAINT FINISH, MAKE ESCUTCHEONS PRIME PAINTED; OTHERWISE, MAKE ESCUTCHEONS NICKEL OR CHROME PLATED. WHERE PIPING IS INSULATED, FIT ESCUTCHEONS OUTSIDE INSULATION.

H. PIPE IDENTIFICATION AND TAGS

1. IDENTIFY EACH PIPE, VALVE AND CONTROLS IN EQUIPMENT ROOMS, ABOVE ACCESSIBLE CEILINGS AND IN ACCESSIBLE SHAFTS.

2. COLOR CODE IDENTIFICATION BANDS OR MARKER BACKGROUNDS TO IDENTIFY CONTENTS OF PIPE WITH INITIALS AND DIRECTION OF FLOW LOCATED NEAR EACH VALVE AND FITTING, ON BOTH SIDES OF PIPE PASSING THROUGH WALLS AND ON LONG RUNS AT NOT OVER 20'-0" INTERVALS.

3. AT PLACE WHERE PIPE IS TO HAVE MARKING, COVERED PIPE SHALL BE PROPERLY PRIMED WITH CLEAR LACQUER. AFTER MARKING IS APPLIED, COAT WITH LACQUER. APPLY MARKING ADJACENT TO VALVES AND EQUIPMENT AT MAJOR CHANGES IN DIRECTIONS, WHERE PIPES PASS THROUGH WALLS OR FLOORS.

4. ALL VALVES SHALL BE PROVIDED WITH BRASS NUMBERED TAGS ATTACHED TO HANDLE WITH A BRASS CHAIN OR RING. WIRING OF TAGS WILL NOT BE ACCEPTABLE. AT THE COMPLETION OF THE WORK, A REPRODUCIBLE VALVE SCHEDULE SHALL BE PROVIDED. THREE (3) COPIES OF THIS SHALL BE MOUNTED IN METAL, GLASS COVERED FRAMES WHERE REQUESTED BY THE ARCHITECT. THE SCHEDULE SHALL GIVE A DESCRIPTION OF THE LINE OR EQUIPMENT CONTROLLED; THE NORMAL POSITION, EMERGENCY AND/OR SHUTDOWN POSITION AND LOCATION GIVEN EITHER BY DESCRIPTION OR DIAGRAM. ALL CONTROLS, STARTERS, SWITCHES, ETC, SHALL BE IDENTIFIED BY EMBOSSED STENCIL OR ENGRAVED PLATE AS TO PURPOSE AND/OR EQUIPMENT CONTROLLED. CONTROL WIRING SHALL BE IDENTIFIED WITH PROGRAM NUMBER AND DEVICE IT SERVICES.

I. ACCESS PANELS

1. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL REQUIRED ACCESS PANELS NECESSARY FOR HIS WORK. THIS INCLUDES ANY ACCESS PANELS REQUIRED FOR PLUMBING AND FIRE PROTECTION. EACH CONTRACTOR SHALL ALSO PROVIDE ACCESS PANELS FOR ANY EXISTING CONDITIONS AS REQUIRED.

2. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR TYPE OF ACCESS PANEL AND COORDINATE LOCATIONS PRIOR TO ANY WORK.

3. CONTRACTOR SHALL MARK LAY-IN CEILING TILES, IN A METHOD APPROVED BY THE ARCHITECT, WHERE ACCESS IS REQUIRED TO SUCH MECHANICAL, PLUMBING, AND FIRE PROTECTION EQUIPMENT, VALVES, REGULATORS, MIXING BOXES, FIRE DAMPER, ETC.

J. EXPANSION JOINTS

1. EXPANSION JOINTS IN PIPING FOR HEATING AND DOMESTIC WATER SYSTEM 2-1/2" AND BELOW SHALL BE FLEXICRAFT ML LOOP STAINLESS STEEL FOR STEEL AND COPPER PIPE OR FLEXONICS MODEL H, STAINLESS STEEL BELLOWS, INTERNAL GUIDES, ANTI-TORQUE DEVICE FOR STEEL PIPE AND MODEL HB, BRONZE BELLOWS, INTERNAL GUIDES, ANTI-TORQUE DEVICE FOR COPPER PIPE; END CONNECTIONS TO MATCH CORRESPONDING PIPE CONSTRUCTION.

2. EXPANSION JOINTS IN HEATING AND DOMESTIC WATER SYSTEMS 3" PIPE SIZE AND ABOVE SHALL BE FLEXONICS CORRUGATED BELLOWS TYPE WITH MATED NECK RINGS AND CONTROL RINGS; ALLOWABLE WORKING PRESSURE TO BE 300 PSIG AT 850 DEGREES F. END CONNECTIONS TO BE FLANGED.

3. PIPE ALIGNMENT GUIDE TO BE STEEL SPIDER (COPPER CLAD FOR COPPER PIPE) HOUSED IN A STEEL SLEEVE WITH FEET FOR ATTACHMENT TO STRUCTURE.

4. EXPANSION LOOPS SHALL BE PROVIDED ON ALL PIPE RUNS OVER 100 FT IN LENGTH. SIZE LOOP PER MANUFACTURER'S RECOMMENDATIONS OR AS SCHEDULED.

K. PAINTING

1. THIS CONTRACTOR SHALL PERFORM ALL PAINTING INCIDENTAL TO THIS WORK.

2. ALL INSULATION SHALL BE PAINTED AT THE TIME OF INSTALLATION WITH ONE COAT OF BENJAMIN FOSTER "LAGTONE" WATER BASE PAINT. AT THE COMPLETION OF THE WORK, ALL SUCH INSULATION SHALL BE GIVEN AN ADDITIONAL COAT OF ALKYD RESIN PAINT OF A COLOR TO MATCH EXISTING BUILDING STRUCTURE OR AS SELECTED BY THE ARCHITECT.

3. ALL UNCOVERED BLACK IRON PIPE, FITTINGS, IRON PORTIONS OF VALVES, HANGERS, STRUCTURAL STEEL, EXPANSION TANKS, COOLING TOWER SUMPS AND ALL OTHER BLACK IRON WORK SHALL BE THOROUGHLY CLEANED AND GIVEN TWO COATS OF ALKYD RESIN PAINT OF A COLOR TO MATCH EXISTING BUILDING STRUCTURE OR AS SELECTED BY THE ARCHITECT.

4. ALL UNCOVERED EXPOSED SHEET METAL SHALL BE THOROUGHLY CLEANED AND NEUTRALIZED AND GIVEN TWO (2) COATS OF ALKYD RESIN PAINT OF A COLOR TO MATCH EXISTING BUILDING STRUCTURE OR AS SELECTED BY THE ARCHITECT.
5. ALL PAINTING SHALL BE DONE WITH A BRUSH OR ROLLER. SPRAY PAINTING WILL BE PROHIBITED.

6. ALL FINISHING MATERIALS, THINNERS, ETC., SHALL BE THE BEST QUALITY, FIRST LINE MATERIALS AS MANUFACTURED BY:

a. E.I. DUPONT DE NEMOURS AND COMPANY
b. PRATT AND LAMBERT, INC.
c. THE GLIDDEN COMPANY
d. THE SHERWIN-WILLIAMS COMPANY
e. THE PITTSBURGH PLATE GLASS COMPANY

7. ALL PAINT MATERIALS SHALL BE DELIVERED TO THE JOB IN THE MANUFACTURER'S ORIGINAL UNOPENED AND LABELED CONTAINERS, AND THEY SHALL BE USED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS.

8. THIS CONTRACTOR SHALL SUBMIT A LIST OF MATERIALS TO THE ARCHITECT. THE LIST SHALL STATE THE BRANCH NAMES OF THE MATERIALS THAT THE CONTRACTOR INTENDS TO USE. THIS LIST SHALL BE SECURED FROM THE PAINT MANUFACTURER AND SHALL BE ON HIS STATIONERY.

9. THE ARCHITECT'S APPROVAL MUST BE SECURED BEFORE ANY PAINTING WORK IS STARTED.

SECTION 200523 PIPES AND VALVES

A. GENERAL

1. FURNISH ALL MATERIAL, LABOR, EQUIPMENT, AND ACCESSORIES AS REQUIRED TO INSTALL COMPLETE FIRE PROTECTION, PLUMBING, AND HVAC PIPING SYSTEMS AS INDICATED ON DRAWINGS AND IN THESE SPECIFICATIONS.

2. INSTALL IN FULL ACCORDANCE WITH LOCAL CODE REQUIREMENTS, SEE OTHER SPECIFICATION SECTION FOR ADDITIONAL REQUIREMENTS AND INSTALL IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS.

B. CONNECTIONS TO EQUIPMENT FURNISHED BY OTHERS

1. PROVIDE VALVED WATER AND/OR GAS CONNECTION FOR EQUIPMENT FURNISHED BY OTHER CONTRACTORS OR OWNER.

2. INCLUDE ACCESSORIES REQUIRED BY CODE, DRAWINGS AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.

3. FULLY COORDINATE WITH LAB EQUIPMENT, POOL EQUIPMENT, KITCHEN EQUIPMENT, AND LAUNDRY EQUIPMENT SUPPLIERS AND CONFIRM ALL ROUGH-IN REQUIREMENTS PRIOR TO STARTING WORK.

C. INSTALLATION

1. ALL PIPING SHALL BE INSTALLED PARALLEL WITH OR PERPENDICULAR TO THE BUILDING WALLS. ALL VERTICAL RISERS SHALL BE INSTALLED PLUMB AND STRAIGHT. ALL PIPING ABOVE ACCESSIBLE CEILINGS SHALL BE INSTALLED AS HIGH AS POSSIBLE AND AT HEIGHT TO ALLOW SUFFICIENT SPACE FOR CEILING PANEL REMOVAL.

2. ALL PIPING SHALL BE INSTALLED WITH PITCH IN THE DIRECTION OF FLOW OF NOT LESS THAN 1" IN FORTY FEET, EXCEPT AS OTHERWISE SHOWN. IT MUST BE POSSIBLE TO DRAIN EVERY PORTION OF THE PIPING SYSTEM.

3. RUN LINES AS DIRECT AS POSSIBLE AND AVOID UNNECESSARY OFFSETS. HOWEVER, IF OFFSETS ARE REQUIRED IN ORDER TO OBTAIN MAXIMUM HEADROOM OR TO AVOID CONFLICT WITH OTHER WORK, THEY SHALL BE MADE AS REQUIRED OR AS REQUESTED BY THE ARCHITECT WITHOUT ADDITION COST TO THE OWNER. THE ARCHITECT RESERVES THE RIGHT TO MAKE MINOR CHANGES IN THE LOCATION OF PIPING AND EQUIPMENT DURING THE ROUGHING-IN, WITHOUT ADDITIONAL COST TO THE OWNER. ALL CHANGES PROPOSED BY OTHERS SHALL BE APPROVED BY THE ARCHITECT.

4. LINES SHALL BE CUT ACCURATELY TO MEASUREMENT AT THE SITE AND WORKED INTO PLACE WITHOUT SPRINGING OR FORCING. SUFFICIENT OFFSETS, PIPE LOOPS OR EXPANSION JOINTS BETWEEN ANCHOR POINTS SHALL BE PROVIDED AS NEEDED, WHETHER OR NOT SHOWN, TO LIMIT STRESSES AND CONTROL MOVEMENT OF LINES SUBJECT TO THE THERMAL EXPANSION.

5. BEFORE ANY PIPING IS INSTALLED, IT SHALL BE UP-ENDED AND POUNDED TO REMOVE ANY FOREIGN MATTER PRESENT, AND SHALL BE SWABBED, IF NECESSARY, FOR THOROUGH CLEANING. AFTER INSTALLATION AND BEFORE FINAL CONNECTIONS MADE, ALL PIPING SYSTEM SHALL BE FLUSHED WITH A MATERIAL THAT IS NOT INJURIOUS TO EITHER PIPE OR EQUIPMENT. (SEE ALSO "TESTS AND ADJUSTMENTS.")

6. PIPE TO BE THREADED SHALL BE CUT SQUARE AND FULL THREADED WITH CLEAN-CUT TAPERED THREADS AND SHALL BE REAMED AFTER THREADING. THREADED CONNECTIONS SHALL BE MADE WITH PIPE THREAD COMPOUND APPLIED TO THE WALL THREADS ONLY.

7. THE EDGES OF PIPE TO BE WELDED SHALL BE MACHINE BEVELED WHEREVER POSSIBLE. BEFORE WELDING, THE SURFACES SHALL BE THOROUGHLY CLEANED. THE PIPING SHALL BE CAREFULLY ALIGNED. NO METAL SHALL PROJECT WITHIN THE PIPE. MITERED JOINTS ARE PROHIBITED. ONLY FACTORY FORMED FITTINGS SHALL BE USED. ELBOWS SHALL BE LONG RADIUS TYPE. FLANGES SHALL BE WELDING NECK TYPE. MITERING OF THE PIPE TO FORM ELBOWS OR THE NOTCHING OF STRAIGHT RUNS TO FORM THE TEE CONNECTION WILL NOT BE PERMITTED.

8. UNIONS OR COMPANION FLANGES SHALL BE INSTALLED IN ALL CONNECTIONS TO EQUIPMENT, AUTOMATIC VALVES, ETC., AS NECESSARY TO PERMIT REMOVAL OF EQUIPMENT AND SPECIALTIES FOR SERVICING, REPAIRING OR CLEANING. IT SHALL BE POSSIBLE TO REMOVE ANY PIECE OF EQUIPMENT BY REMOVING ONLY ONE OR TWO SECTIONS OF PIPING.

9. VALVES SHALL BE PROVIDED IN SUITABLE LOCATIONS AT EACH ITEM OF EQUIPMENT, BRANCH CIRCUIT, RISER, OR SECTION OF PIPING AS INDICATED OR REQUIRED FOR PROPER AND SAFE OPERATION OF THE SYSTEM AND TO FACILITATE MAINTENANCE AND/OR REMOVAL OF ALL EQUIPMENT AND APPARATUS. ON HORIZONTAL PIPE RUNS, INSTALL ALL VALVE STEMS VERTICALLY UP WHERE POSSIBLE AND IN NO CASE SHALL THE STEMS BE TURNED MORE THAN 90 DEGREES FROM THE VERTICALLY UP POSITION.

10. DRAIN VALVES SHALL BE PROVIDED AT ALL LOW POINTS, TRAPPED SECTION, AND ON THE EQUIPMENT SIDE OF ALL BRANCH VALVES TO PERMIT DRAINING OF ALL PARTS OF ALL LIQUID PIPING SYSTEMS. DRAIN VALVES SHALL HAVE THREADED HOSE ENDS WITH CAP AND CHAIN. DRAIN PIPING SHALL BE PROVIDED FROM PUMP GLANDS, RELIEF VALVES, ETC., TO SPILL AT THE FLOOR OVER FLOOR DRAINS OR OTHER ACCEPTABLE DISCHARGE POINTS. THE DRAIN LINE SHALL TERMINATE WITH PLAIN, UNTHREADED END WITH A MINIMUM 2" AIR GAP AT FLOOR DRAIN.

11. TAPS (HALF COUPLINGS OR TEES) SHALL BE PROVIDED AS NECESSARY TO PERMIT THE INSTALLATION OF TEMPERATURE CONTROL INSTRUMENTS, THERMOMETERS, PRESSURE GAUGES, AIR VENTS, ETC.

12. CONNECTIONS BETWEEN COPPER PIPING AND SCREWED FERROUS EQUIPMENT CONNECTIONS OR SCREWED FERROUS PIPING SYSTEMS SHALL BE MADE AS FOLLOWS:

A. FOR STATIONARY NON-ROTATING, NON-VIBRATING EQUIPMENT CONNECTIONS: DIELECTRIC UNIONS.
B. FOR ROTATING OR VIBRATING EQUIPMENT CONNECTION: CAST BRASS ADAPTER AND BRONZE FLANGES WITH DIELECTRIC SEPARATION OF FLANGES AND BOLTS.
C. CONNECTIONS BETWEEN COPPER PIPING AND FERROUS EQUIPMENT FLANGES OR FLANGED FERROUS PIPING SYSTEMS SHALL BE MADE USING BRONZE COMPANION FLANGE WITH DIELECTRIC SEPARATION OF FLANGES AND BOLTS.
D. BRASS OR BRONZE VALVES IN FERROUS PIPING WILL NOT REQUIRE DIELECTRIC SEPARATION.
E. NIPPLES BETWEEN COPPER PIPING AND EQUIPMENT OR FIXTURE CONNECTION FITTINGS SHALL BE BRASS, NOT E. GALVANIZED STEEL.

13. ALL PRESSURE PIPING SYSTEMS SHALL BE INSTALLED TO CONFORM TO THE REQUIREMENTS OF THE LOCAL AHJ OR STATE'S PRESSURE PIPING SYSTEM CODE.

14. ALL EXCAVATIONS FOR INSTALLATION OF PIPE SHALL BE OPEN TRENCH WORK AND SHALL BE KEPT OPEN UNTIL PIPING HAS BEEN INSPECTED, TESTED, AND ACCEPTED.

15. ALL PIPING PASSING THRU CAST-IN PLACE CONCRETE CONSTRUCTION SHALL BE SLEEVED TO PROVIDE A MINIMUM OF 1/2"ANNULAR SPACE AROUND ENTIRE PIPE TO BE SLEEVED. SPACE BETWEEN SLEEVE AND PIPES IN FOUNDATION WALLS SHALL BE TIGHTLY CAULKED OR MECHANICAL SEAL TO GIVE A WATERPROOF PENETRATION.

16. ANY PIPING RESTING ON OR COMING IN CONTACT WITH BUILDING STRUCTURE SHALL BE INSULATED AT THAT POINT TO PREVENT TELEGRAPHING OF SOUND.

17. METAL PIPING LAID IN CORROSIVE FILL SHALL BE ENCASED IN CONCRETE OR IN SPLIT TILE.

18. THREADED JOINTS SHALL CONFORM TO AMERICAN TAPER PIPE THREAD ASA-B2.1-1960. ALL BURRS SHALL BE REMOVED, PIPE ENDS SHALL BE REAMED OR FILED TO SIZE OF BORE AND ALL CHIPS REMOVED. PIPE CEMENT SHALL BE USED ONLY ON MALE THREADS.

19. UNIONS SHALL HAVE METAL SEATS FOR DRAINAGE SYSTEMS AND METAL TO METAL GROUND SEATS ON WATER SYSTEM.

20. FURNISH AND INSTALL VALVE IN BRANCHES TO SILL COCKS, TOILET ROOMS AND OTHER FIXTURE GROUPS. PLUMBING FIXTURES SHALL HAVE WHEEL OR SCREWDRIVER STOPS AS SPECIFIED.

21. ALL PIPING SHALL BE RIGIDLY SUPPORTED AND SHALL NOT BE LOOSE OR SHAKY.

D. SANITARY, WASTE AND VENT SEWERS

1. INSTALL SEWERS, STACKS, VENTS, DRAINS, ETC., AS INDICATED ON THE DRAWINGS.

2. ALL DRAINAGE AND VENT PIPING SHALL BE CONSTRUCTED AND RUN AS DIRECT AS POSSIBLE, PROTECTED FROM CONTACT WITH SLAG OR CINDERS AND WHEREVER PRACTICABLE, SHALL BE LOCATED SO AS TO BE ACCESSIBLE FOR INSPECTION. THE ACTUAL RUNS AND LOCATIONS OF DRAINS, SOIL WASTE, AND LEADER PIPING SHALL BE INSTALLED AS TO MEET WITH THE VARIOUS CONDITIONS AT THE BUILDING AND ANY WORK NECESSARY TO CONCEAL PIPES OR CLEAR PIPES OF OTHER TRADES SHALL BE DONE AS DIRECTED BY THE ARCHITECT.

3. SEWERS TO BE PITCHED A MINIMUM OF 1/4" PER FOOT FOR 3" SIZES AND UNDER AND 1/8" PER FOOT FOR 4" SIZES AND LARGER OR TO SLOPE AS INDICATED ON DRAWINGS. KITCHEN SANITARY WASTE SHALL BE SLOPED ¼" PER FOOT FOR ALL PIPE SIZES.

4. ALL PIPING SHALL BE CORRECTLY ALIGNED BEFORE JOINS ARE MADE. ALL CHANGES OF DIRECTION IN DRAINAGE AND VENT PIPING SHALL BE MADE BY MEANS OF "Y" BRANCHES AND 1/6, 1/8 OR 1/16 BENDS. NO LINES SHALL BE RUN WITH UNNECESSARY BENDS OR OFFSETS AND WHERE CHANGES IN DIRECTION ARE UNAVOIDABLE; THEY SHALL BE MADE BY USE OF PROPER FITTINGS. SINGLE AND DOUBLE SANITARY TEES, 1/4 BENDS AND 1/8 BENDS MAY BE USED IN VERTICAL SECTIONS WHEN DIRECTION OF FLOW IS FROM HORIZONTAL TO VERTICAL. CHANGES IN DIRECTION AND BRANCH CONNECTIONS SHALL BE MADE WITH APPROVED DRAINAGE FITTINGS COMPATIBLE WITH THE PIPING SYSTEM MATERIAL IN WHICH IT IS INSTALLED.

5. INSTALL CLEANOUTS AT BASE OF EACH VERTICAL WASTE AND RAINWATER STACK, EACH CHANGE IN A DIRECTION OF PIPING GREATER THAN 45 DEGREES, WITHIN FIVE FEET (5'-0") OF MAIN SEWER AFTER EXITING THE BUILDING, OR AS SHOWN ON DRAWINGS. CLEANOUTS ON UNDERGROUND LINES SHALL EXTEND UP FLUSH WITH FINISHED FLOOR OR GRADE. PROVIDE CLEANOUTS NOT OVER 50'- 0" ON CENTER ALONG STRAIGHT RUNS. CLEANOUTS SHALL BE SIZE OF PIPE TO WHICH IT IS INSTALLED UP TO 6" IN DIAMETER. PIPE OVER 6" IN DIAMETER SHALL HAVE A 6" CLEANOUT.

1 PLUMBING SPECIFICATION SHEET
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TITLE:
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P-200

6. VENT TERMINALS SHALL BE TERMINATED AT LEAST 18" ABOVE ROOF. EACH VENT TERMINAL SHALL BE MADE WATER TIGHT WITH THE ROOF BY USING SHEET COPPER (8 OUNCES PSF) WITH BASE NOT LESS THAN 16" DIAMETER AND COLLAR FULL HEIGHT OF PIPE OR RUBBER BOOT PIPE FLUSHING. WHERE VENTS ARE 4" OR LARGER, FLASHING MAY BE TURNED OVER INTO TOP OF PIPE WITHOUT GAP. FURNISH FLASHING TO GENERAL CONTRACTOR FOR BUILDING INTO ROOFING MATERIAL.

7. ALL FIXTURES AND SANITARY DRAINS SHALL BE VENTED AS INDICATED ON DRAWINGS AND IN ACCORDANCE WITH CODE. VENT PIPES, WHERE NOT VERTICAL SHALL HAVE CONTINUOUS SLOPE UP TO VENT THROUGH ROOF.

8. OPENINGS IN PIPES SHALL BE PROPERLY PLUGGED WHEN WORK IS NOT IN PROGRESS.

9. SEWERS SHALL BE LAID WITH FULL LENGTH OF EACH SECTION RESTING ON A SOLID BED, WHERE NECESSARY TO OBTAIN A FIRM SUPPORT, THE PIPE SHALL BE BEDDED ON SELECT MATERIAL AND THOROUGHLY TAMPED. AS PIPE IS LAID, CARE SHALL BE EXERCISED TO KEEP INTERIOR OF PIPE CLEAR OF FOREIGN MATTER. WHERE TRENCHING FOR PIPE IS EXCESSIVELY WIDE, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, EMBED THE PIPE IN CONCRETE TO SUPPORT THE ADDED LOAD OF BACKFILLING.

10. PIPE SCHEDULE:

A. ELOW GRADE INSIDE BUILDING

1) SERVICE WEIGHT - CAST IRON PIPE ASTM A74 WITH ASTM C-564-80 NEOPRENE COMPRESSION JOINTS OR NO-HUB CISPI WITH CLAMPS. ALL KITCHEN SANITARY SHALL BE CAST IRON ONLY.

B. ABOVE GRADE AND VENT MATERIAL SHALL BE AS FOLLOWS:
1) NO-HUB CAST IRON PIPE CISPI 1-301.

2) 1-1/4" AND SMALLER, SCH. 40 GALVANIZED STEEL PIPE ASTM A-53/A53M, TYPE E WITH SCREWED FITTINGS ASME B-16.4, CLASS 125.

E. EXPANSION JOINTS AND DEFLECTION FITTINGS

3) DUCTILE-IRON, FLEXIBLE EXPANSION JOINTS; AWWA C110 OR AWWA C153 WITH TWO GASKETED BALL-JOINT SECTIONS AND ONE OR MORE GASKETED SLEEVE SECTIONS RATED FOR 250 PSIG MINIMUM.

4) DUCTILE-IRON EXPANSION JOINTS; THREE-PIECE ASSEMBLY OF TELESCOPING SLEEVE WITH GASKETS AND RESTRAINED-TYPE, BALL-AND-SPIGOT END SECTIONS; AWWA C110 OR AWWA C153; RATED FOR 250 PSIG MINIMUM.

5) DUCTILE-IRON DEFLECTION FITTINGS; COMPOUND COUPLING FITTING WITH BALL JOINT, FLEXING SECTION, GASKETS, AND RESTRAINED JOINT ENDS; AWWA C110 OR AWWA C153; RATED FOR 250 PSI MINIMUM AND UP TO 15 DEGREES OF DEFLECTION.

12. PVC PIPING SHALL NOT BE INSTALLED UNLESS PERMITTED BY CODE AND SHALL NOT BE INSTALLED IN RETURN AIR PLENUMS.

F. DOMESTIC WATER PIPING

1. INSTALL DOMESTIC WATER PIPING AS INDICATED ON DRAWINGS. INCLUDE ALL FITTINGS, VALVES, HANGERS, AND OTHER ACCESSORIES INCLUDING WATER METER AND BACKFLOW PREVENTER. EXTEND DOMESTIC WATER PIPING TO ALL FIXTURES AND EQUIPMENT REQUIRED FOR COMPLETE INSTALLATION.

2. INCLUDE UNIONS, OR OTHER DISCONNECT MEANS, STOPS OR VALVES FOR ISOLATION OF FIXTURES AND EQUIPMENT. VALVES TO BE FULLY COMPATIBLE WITH PIPING FOR SERVICE INTENDED AS MANUFACTURED BY NIBCO, CRANE OR MILWAUKEE. INCLUDE HOSE OR DRAIN VALVES AT LOW POINTS WHERE FIXTURES CANNOT BE USED FOR DRAINAGE.

3. INSTALL SHOCK ABSORBERS AT EACH QUICK CLOSING FIXTURE AND WHERE REQUIRED TO PREVENT WATER HAMMER AS MANUFACTURED BY J.R. SMITH, SIOUX CHIEF OR ZURN. ABSORBERS SHALL BE INSTALLED IN VERTICAL UPRIGHT POSITION.

4. HANGERS ON INSULATED PIPE TO BE OUTSIDE OF INSULATION, SIZED ACCORDINGLY WITH A SUFFICIENT SADDLE TO PROTECT INSULATION AS MANUFACTURED BY GRINNELL OR MICHIGAN.

5. PIPE SCHEDULE:

A. BELOW GRADE INSIDE BUILDING (2-1/2" AND LESS)

1) SOFT COPPER ASTM B88, TYPE "K" WITHOUT JOINTS.
2) PIPING MAY BE ROUTED INSIDE A LARGER CONDUIT SO PIPE CAN BE REMOVED WITHOUT EXCAVATION.

B. ABOVE GRADE (2" AND LESS)
1) TYPE "L" HARD COPPER ASTM B 88-832 WITH WROUGHT COPPER FITTINGS ASTM B 16.22 1980 AND NON-LEAD OR ANTIMONY SOLDER JOINTS.

6. FLUSH, VENT AND SANITIZE ALL WATER PIPING WITH CHLORINE AS REQUIRED PER AWWA, LOCAL BUILDING DEPARTMENT AND HEALTH DEPARTMENT CODES.

7. DOMESTIC HOT AND COLD WATER PIPING UNDER CONCRETE FLOOR TO BE COVERED WITH SAND SO THAT PIPING WILL NOT BECOME EMBEDDED IN THE FLOOR SLAB.

8. ALL PIPING UNDER CONCRETE FLOOR SHALL BE TYPE "K" SOFT COPPER, CONTINUOUS. SPLICES OR FITTINGS WILL NOT BE ALLOWED.

9. EXTREME CAUTION MUST BE TAKEN SO THAT NO COPPER PIPING AND INSULATION UNDER CONCRETE FLOORS BECOMES CRUSHED, CUT, SPLIT OR DEFORMED DURING THE POURING OF THE FLOOR SLAB.

10. ALLOW 1-1/4" PER 100 FEET OF LENGTH FOR EXPANSION IN DOMESTIC HOT WATER LINES.

11. ALL PIPING IN RETURN AIR CEILING PLENUMS OR WALLS SHALL BE PLENUM RATED MATERIALS.

SECTION 200593 - TESTING, ADJUSTING AND BALANCING

A. PIPING: TESTING TO BE DONE BY THE CONTRACTOR.

1. ALL PIPING SHALL BE GIVEN THE FOLLOWING PRESSURE TEST WITHOUT APPRECIABLE PRESSURE DROP: CONTRACTOR SHALL USE RECORDING LINE CHARTS TO RECORD ALL PRESSURE TESTING OUTCOMES.

SERVICE	TEST MEDIUM	MIN. PRESSURE	TIME (HOURS)
FIRE	WATER	125 PSI	6
MAIN WATER SERVICE	WATER	125 PSI	AWWA PROCEDURE
COLD WATER	WATER	125 PSI	24
HOT WATER	WATER	125 PSI	24
AIR	AIR	125 PSI	12
SANITARY SEWER	AS PER STATE PLUMBING CODE OR LOCAL AUTHORITY		
WATER SERVICE PIPING	WATER	150 PSI	24
FIRE PROTECTION	SEE FIRE PROTECTION SECTION		
CHILLED WATER	WATER	125 PSI	6
HEATING WATER	WATER	125 PSI	6
CONDENSATE	WATER	125 PSI	6

*A MINIMUM NOTICE OF 48 HOURS SHALL BE GIVEN THE ARCHITECT PRIOR TO PURGING OF ANY GAS LINES. PURGING SHALL BE TO THE OUTSIDE OF BUILDING AT A SAFE LOCATION.

2. DURING THE FINAL INSPECTION OF THE BUILDING, THE CONTRACTOR MAY BE ASKED TO REMOVE AT LEAST ONE WATER CLOSET IN THE PRESENCE OF THE ARCHITECT SO THAT IT CAN BE CHECKED FOR A PROPER INSTALLATION. IF THE ONE TOILET IS FOUND TO BE INSTALLED IN A DEFECTIVE MANNER, THE CONTRACTOR SHALL REMOVE AND PROPERLY REINSTALL ALL TOILETS.

3. CARE SHALL BE EXERCISED IN INSTALLATION OF AIR PIPING SO AS NOT TO ALLOW CONTAMINATION.

4. MINOR LEAKS IN WELDED JOINTS SHALL BE CORRECTED BY CHIPPING OUT THE WELD AND REWELDING. A GENERAL SWEATING OF A WELD JOINT WILL BE CONSIDERED SUFFICIENT CAUSE FOR REJECTION. DEFECTS THAT MAY DEVELOP IN SCREWED JOINTS UNDER TEST SHALL BE CORRECTED BY REPLACING THE FITTING OR THREAD OR BOTH. CAULKING OF DEFECTIVE THREADED JOINTS WILL NOT BE PERMITTED.

5. DURING THE TESTING PERIOD, THIS CONTRACTOR SHALL MAINTAIN ON THE JOB A COMPETENT INDIVIDUAL THOROUGHLY FAMILIAR WITH ALL PHASES OF PLUMBING FOR AS LONG AS MAY BE REQUIRED TO THOROUGHLY ADJUST ALL OF THE SYSTEMS AND TO DEMONSTRATE TO THE ARCHITECT THAT THEY ARE FUNCTIONING PROPERLY.

6. ADJUST ALL FLUSH VALVES AND BALANCING VALVES FOR PROPER FLOW.

7. ALL HYDROSTATIC AND/OR AIR TESTS SHALL BE MADE BEFORE PIPING IS CONCEALED OR COVERED. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETELY DRAINING THE SYSTEMS AFTER HYDROSTATIC TESTS ARE PERFORMED. ANY DAMAGE FROM FREEZING PRIOR TO ACCEPTANCE OF THE COMPLETED INSTALLATION SHALL BE REPAIRED AT THE SOLE EXPENSE OF THIS CONTRACTOR.

8. ALL MATERIALS AND INSTALLATIONS UNDER THE PLUMBING SYSTEM SHALL BE INSPECTED BY THE INSPECTOR TO ENSURE COMPLIANCE WITH REQUIREMENTS OF THE PLUMBING CODE.

9. THIS CONTRACTOR SHALL NOTIFY THE PLUMBING INSPECTOR WHENEVER WORK IS READY FOR TEST AND INSPECTION.

10. WHEN WORK FOR THE PLUMBING PERMIT IS ISSUED AND COMPLETED, THIS CONTRACTOR SHALL REQUEST FINAL INSPECTION. SUCH REQUEST SHALL BE MADE BEFORE THE BUILDING IS OCCUPIED OR USED BUT NOT MORE THAN 30 DAYS AFTER COMPLETION OF THE WORK.

11. BEFORE APPROVING THE PLUMBING SYSTEM, THE PLUMBING INSPECTOR MAY REQUIRE THAT THE SYSTEM IN WHOLE OR PART BE TESTED TO PROVE SUFFICIENCY. ALL EQUIPMENT, MATERIAL, POWER AND LABOR NECESSARY FOR INSPECTIONS AND TEST SHALL BE SUPPLIED BY THE PLUMBING CONTRACTOR.

12. ALL PIPING OF PLUMBING SYSTEM SHALL BE TESTED WITH WATER OR AIR PER TESTING SCHEDULE.

A. DRAINAGE SYSTEM WATER TEST: PROVIDE FITTING AT PROPERTY LINE OR TERMINATION POINT FOR PURPOSE OF TEST PLUG. WATER TEST SHALL BE APPLIED TO ENTIRE SYSTEM OR BY SECTION. WHEN TESTED IN SECTIONS, AT LEAST THE LOWER 20 FEET OF THE NEXT SECTION ABOVE SHALL BE RETESTED SO THAT EVERY SECTION TESTED SHALL HAVE AT LEAST A 20-FOOT HEAD TEST. HOLD WITHOUT PRESSURE LOSS FOR 15 MINUTES.

B. DRAINAGE SYSTEM AIR TEST - ATTACH AIR APPARATUS TO SUITABLE OPENING, CLOSE ALL OTHER INLETS AND OUTLETS, AND THEN FORCE AIR INTO THE SYSTEM UNTIL THERE IS UNIFORM PRESSURE, SUFFICIENT TO BALANCE A COLUMN OF MERCURY 10" IN HEIGHT OR 5 POUNDS GAUGE PRESSURE ON THE ENTIRE SYSTEM. HOLD WITHOUT PRESSURE LOSS FOR 15 MINUTES.

C. NO PART OF SYSTEM SHALL BE COVERED BEFORE INSPECTION IS MADE AND APPROVED. IF COVERED BEFORE TEST, CONTRACTOR SHALL PAY FOR COST OF UNCOVERING SO TEST CAN BE MADE AND ACCEPTED.

D. DEFECTIVE WORK OR MATERIALS SHALL BE REPLACED AND INSPECTION AND TESTS REPEATED WITHIN THREE DAYS.

13. CERTIFICATES OF APPROVAL OF SATISFACTORY COMPLETION AND FINAL INSPECTION SHALL BE OBTAINED BY THE PLUMBING CONTRACTOR. ONE COPY OF EACH APPROVAL SHALL BE GIVEN TO THE ARCHITECT.

14. DAMAGES WHICH RESULT FROM BREAKAGE OR FAULTY INSTALLATION SHALL BE THE RESPONSIBILITY OF THE PLUMBING CONTRACTOR.

15. AFTER THE SYSTEM HAS BEEN IN SERVICE FOR A TWO-WEEK PERIOD AND AGAIN BEFORE THE SYSTEM IS TURNED OVER TO THE OWNER, ALL DIRT POCKETS, TRAPS, AND STRAINERS SHALL BE CLEANED, REMOVED, AND REINSTALLED.

E. WATER USING EQUIPMENT: ALL WATER USING EQUIPMENT, SUCH AS BUT NOT LIMITED TO, COOLING COILS AND CONVERTORS, SHALL BE BALANCED TO OBTAIN THE REQUIRED WATER PRESSURE DROP AND FLOW. THIS CONTRACTOR SHALL LIST THE FLOW RATE AND REQUIRED PRESSURE DROP AND THE OBSERVED PRESSURE DROP FOR EACH PIECE OF EQUIPMENT.

F. PUMPS: FOR EACH PUMP, THE CONTRACTOR SHALL LIST ALL THE PUMP DESIGN DATA AND SHALL OBTAIN BY MEASUREMENT AND FURNISH TO THE ARCHITECT/ENGINEER THE PUMP MOTOR VOLTAGE, AMPERAGE, AND PUMP HEADS WITH NO WATER FLOW AND WITH FULL WATER FLOW.

2. PERCENTAGE OF AIR QUANTITY SHALL BE EXPRESSED AS A FRACTION OF THE TOTAL AIR SUPPLY.

INSULATION

C. GENERAL

1. FURNISH ALL MATERIAL, LABOR AND EQUIPMENT AS REQUIRED TO INSTALL COMPLETE PLUMBING INSULATION AS INDICATED ON MECHANICAL DRAWINGS AND IN THESE SPECIFICATIONS.
2. INSTALL IN FULL ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

B. SCOPE: THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL INSULATION NECESSARY TO THE PROJECT AND IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS. ALL INSULATION AND ACCESSORIES USED IN AN AIR PLENUM SPACE, AND ALL DUCT COVERING AND LINING, REGARDLESS OF PHYSICAL LOCATION, SHALL HAVE A COMPOSITE (INSULATION, JACKET, AND ADHESIVE) FIRE AND SMOKE HAZARD RATING AS TESTED UNDER PROCEDURE ASTM E-84, NFPA 255 AND UL 723, NOT EXCEEDING A FLAME SPREAD 25 AND SMOKE DEVELOPED 50. ALL OTHER AREAS SHALL HAVE INSULATING MATERIALS AND ACCESSORIES ON PIPES AND VESSELS RATED AT A FLAME SPREAD 25 AND SMOKE DEVELOPED 150 AS TESTED BY THE SAME PROCEDURE. ALL CALCIUM SILICATE SHALL BE ASBESTOS FREE.

C. WORKMANSHIP:

1. ALL INSULATION SHALL BE INSTALLED OVER CLEAN, DRY SURFACES. INSULATION MUST BE DRY AND IN GOOD CONDITION. WET OR DAMAGED INSULATION WILL NOT BE ACCEPTABLE. NO INSULATION SHALL BE APPLIED PRIOR TO PRESSURE TEST COMPLETION OF THE RESPECTIVE PIPING.

2. ALL PIPE INSULATION SHALL BE INSTALLED WITH JOINTS BUTTED FIRMLY TOGETHER. ALL VALVES AND FITTINGS SHALL BE INSULATED USING MITERED SECTIONS OF INSULATION EQUAL IN DENSITY AND THICKNESS TO THE ADJOINING INSULATION, OR WITH AN INSULATION CEMENT EQUAL IN THICKNESS TO THE ADJOINING INSULATION OR PREMOLDED INSULATED FITTINGS. THE INSULATION APPLIED TO THE VALVES AND FITTINGS SHALL BE COVERED WITH THE SAME TYPE OF COVERING AS USED ON THE PIPE INSULATION. NO STAPLES.

3. ALL INSULATION ENDS SHALL BE TAPERED AND SEALED REGARDLESS OF SERVICES

4. ALL INSULATED, EXPOSED PIPING 8'-0" AND BELOW TO THE FINISHED FLOOR SHALL INCLUDE A 0.020" THICK VINYL JACKET. THIS JACKET IS IN ADDITION TO THE NORMAL FINISH FOR THE RESPECTIVE SERVICE.

5. REPAIR ALL DAMAGED SECTIONS OF THE EXISTING PIPING AND MECHANICAL INSULATION DAMAGED DURING THIS CONSTRUCTION PERIOD. USE

6. REPLACE DAMAGED INSULATION WHICH CANNOT BE REPAIRED SATISFACTORILY, INCLUDING UNITS WITH VAPOR BARRIER DAMAGE AND MOISTURE.SATURATED UNITS.

D. PLUMBING INSULATION (AS MANUFACTURED BY OWENS CORNING, KNAUF OR SCHULLER)

1. INSULATE ALL ABOVE-GRADE HOT WATER, HOT WATER RETURN AND COLD WATER PIPING WITH 1" THICK MOLDED FIBERGLASS HAVING AN ALL SERVICE JACKET.
2. INSULATE ALL ABOVE-GRADE, HORIZONTAL AIR CONDITIONING CONDENSATE FLOOR DRAINS AND WASTE LINES, OVERFLOW ROOF DRAINS AND PIPING, ROOF DRAINS AND PIPING AND ROOF DRAIN SUMPS WITH 1" THICK MOLDED FIBERGLASS HAVING AN ALL SERVICE JACKET.
3. INCLUDE INSULATION OF FITTINGS AND VALVES. KEEP VAPOR BARRIERS INTACT. APPLY PER MANUFACTURER'S RECOMMENDATIONS.
4. INSULATE ALL EXPOSED WASTE AND WATER SUPPLY PIPING UNDER LAVATORY WITH SAFETY COVERS PER ADA REQUIREMENTS (AS MANUFACTURED BY PLUMBEREX SPECIALTY PRODUCTS, MCGUIRE OR TRUEBRO).

PLUMBING FIXTURES AND EQUIPMENT

A. GENERAL

1. FURNISH ALL FIXTURES AND EQUIPMENT INDICATED AND SCHEDULED ON DRAWINGS, COMPLETE WITH ALL ACCESSORIES, CONTROLS, ETC., AS REQUIRED.

2. PROVIDE FACTORY-FABRICATED FIXTURES OF TYPE, STYLE AND MATERIAL INDICATED. FOR EACH TYPE FIXTURE, PROVIDE FIXTURE MANUFACTURER'S STANDARD TRIM, CARRIER, SEATS AND VALVES AS SHOWN BY THEIR PUBLISHED PRODUCT INFORMATION AND INDICATED IN THE PLUMBING FIXTURES SCHEDULE; EITHER AS DESIGNED AND CONSTRUCTED OR AS RECOMMENDED BY MANUFACTURER AND AS REQUIRED FOR COMPLETE INSTALLATION. WHERE MORE THAN ONE TYPE IS INDICATED, SELECTION IS INSTALLER'S OPTION, BUT ALL FIXTURES OF SAME TYPE MUST BE FURNISHED BY SINGLE MANUFACTURER. WHERE TYPE IS NOT OTHERWISE INDICATED, PROVIDE FIXTURES COMPLYING WITH GOVERNING REGULATIONS.

3. WHERE FITTINGS, TRIM AND ACCESSORIES ARE EXPOSED OR SEMI-EXPOSED, PROVIDE BRIGHT CHROME-PLATED OR POLISHED STAINLESS STEEL UNITS .PROVIDE COPPER OR BRASS WHERE NOT EXPOSED.

4. WATER OUTLETS: AT LOCATIONS WHERE WATER IS SUPPLIED (BY MANUAL, AUTOMATIC OR REMOTE CONTROL), PROVIDE COMMERCIAL QUALITY. FAUCETS, VALVES OR DISPENSING DEVICES OF TYPE AND SIZE INDICATED AND AS REQUIRED TO OPERATE AS INDICATED. INCLUDE MANUAL SHUT-OFF VALVES AND CONNECTING STEM PIPES TO PERMIT OUTLET SERVICING WITHOUT SHUT-DOWN OF WATER SUPPLY PIPING SYSTEMS.

5. VACUUM BREAKERS: PROVIDE WITH FLUSH VALVES WHERE REQUIRED BY GOVERNING REGULATIONS, INCLUDING LOCATIONS WHERE WATER OUTLETS ARE EQUIPPED FOR HOSE ATTACHMENT.

6. WATER HAMMER ARRESTORS: PROVIDE WATER HAMMER ARRESTORS WHERE SHOWN ON THE DRAWINGS AND AS REQUIRED TO PREVENT WATER HAMMER AND EXCESSIVE VIBRATION IN THE DOMESTIC WATER SYSTEM. ARRESTORS TO BE OF SIZE INDICATED OR AS RECOMMENDED BY THE MANUFACTURER.

7. P-TRAPS: INCLUDE REMOVABLE P-TRAPS (WITH CLEAN OUT PLUG) WHERE DRAINS ARE INDICATED FOR DIRECT CONNECTION TO DRAINAGE SYSTEM.

8. CARRIERS: PROVIDE CAST IRON SUPPORTS FOR FIXTURES OF EITHER GRAPHITIC GRAY IRON, DUCTILE IRON OR MALLEABLE IRON AS INDICATED.

9. FIXTURE BOLT CAPS: PROVIDE MANUFACTURER'S STANDARD EXPOSED FIXTURE BOLT CAPS FINISHED TO MATCH FIXTURE FINISH.

10. ESCUTCHEONS: WHERE FIXTURE SUPPLIES AND DRAINS PENETRATE WALLS IN EXPOSED LOCATIONS, PROVIDE CHROME-PLATED SHEET STEEL ESCUTCHEONS WITH FRICTION SLIPS.

11. AERATORS: PROVIDE AERATORS OF TYPES APPROVED BY HEALTH DEPARTMENT HAVING JURISDICTION.

12. COMPLY WITH ADDITIONAL FIXTURE REQUIREMENTS CONTAINED IN FIXTURE SCHEDULE ON DRAWINGS.

B. REFER TO PLUMBING PLANS FOR PLUMBING FIXTURE SPECIFICATIONS.

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1 PLUMBING SPECIFICATION SHEET
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TITLE:
PLUMBING SPECIFICATION SHEET (02 OF 02)

SHEET NUMBER:
P-201

PLUMBING SYMBOLS LIST

PLUMBING LEGENDS

EX.S	EXISTING SANITARY
	EXISTING VENT
S	SANITARY SEWER
	VENT PIPING
	COLD WATER
	HOT WATER
	RECIRCULATING HOT WATER
	SECONDARY BFP
	BALANCING VALVE
	PIPE UP OR DOWN
	PIPE UP
	UNION
	ISOLATION VALVE
FCO	FLOOR CLEANOUT
CO	CLEANOUT
	BACKFLOW PREVENTER
	POINT OFF CONNECTION
	RE-CIRCULATION PUMP
	HUB / FLOOR DRAIN
CD	CONDENSATE DRAIN

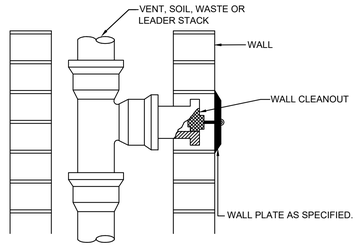
PLUMBING ABBREVIATIONS

CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
S	SANITARY
VTR	VENT THRU ROOF
V	VENT
AFF/AFG	ABOVE FINISHED FLOOR/GRADE
AHJ	AUTHORITY HAVING JURISDICTION
BFP	BACKFLOW PREVENTER
ETR	EXISTING TO REMAIN
CO	CLEANOUT
GC	GENERAL CONTRACTOR
IW	INDIRECT WASTE
PC	PLUMBING CONTRACTOR
WCO	WALL CLEANOUT
EWH	WATER HEATER
ET	EXPANSION TANK
RCP	RE CIRCULATION PUMP
FD	FLOOR DRAIN
TYP	TYPICAL
VLL	VERIFY WITH LANDLORD
WHA	WATER HAMMER ARRESTOR
VIF	VERIFY IN FIELD
E	EXISTING
MS	MOP SINK
WC	WATER CLOSET
LAV	LAVATORY
SK	SINK
F	FRANCHISE
EV	EQUIPMENT VENDOR
CC	CONTRACTORS CHOICE
OC	OWNERS CHOICE

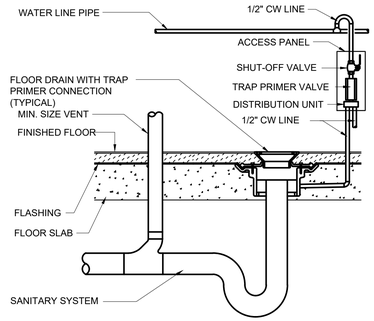
NOTES :
1. REFER TO RISER DIAGRAMS FOR PIPE SIZE.
2. REFER TO PLUMBING FIXTURE SCHEDULE.

PLUMBING DRAWING LIST

P-100	PLUMBING FLOOR PLAN, NOTES AND RISER DIAGRAM
P-200	PLUMBING SPECIFICATION SHEET (01 OF 02)
P-201	PLUMBING SPECIFICATION SHEET (02 OF 02)
P-202	PLUMBING SCHEDULE, SYMBOLS, AND DETAILS
P-300	TITLE-24

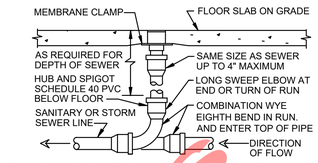


1 | SCALE N.T.S. | WALL CLEAN OUT DETAIL



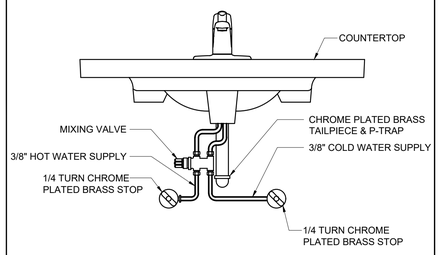
2 | SCALE N.T.S. | FLOOR DRAIN WITH TRAP PRIMER PIPING DETAIL

PROVIDE ROUND SECURED NICKEL BRONZE ADJUSTABLE TOP WITH "CO" CAST IN COVER. PROVIDE CLEANOUT TOP WITH VARIATIONS SUITABLE FOR FLOOR COVERING (CARPET MARKER, RECESSED FOR TILE, SCORIATED FOR UNFINISHED FLOORS). PROVIDE BRONZE PLUG IN CAST IRON BODY.

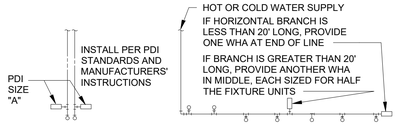


LOCATE AT BUILDING EXIT, AT ENDS OF RUNS, AT TURNS OF PIPE GREATER THAN 45 DEGREES, AT 50' INTERVALS ON STRAIGHT RUNS, AND WHERE SHOWN ON PLANS. PROVIDE BACKFILL PER ARCHITECTURAL SPECIFICATIONS. LOCATE CLEANOUTS WHERE THERE IS 18" CLEAR AROUND. CONSULT LOCAL CODES FOR OTHER FCO REQUIREMENTS.

3 | SCALE N.T.S. | FLOOR CLEAN OUT DETAIL



4 | SCALE N.T.S. | MIXING VALVE DETAILS



SINGLE FIXTURE

PDI SIZE	PIPE SIZE	FIXTURE UNIT LOAD
A	1/2"	1-11
B	3/4"	12-32
C	1"	33-60
D	1-1/4"	61-113
E	1-1/2"	114-154
F	2"	155-330

MULTIPLE FIXTURES

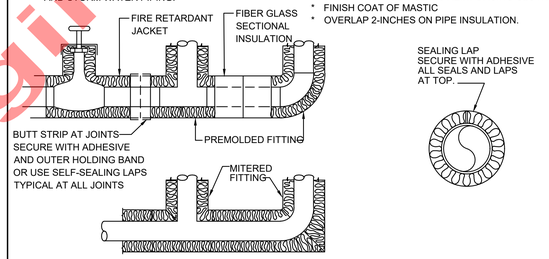
FIXTURE UNIT TABULATION		
FIXTURE	COLD	HOT
VALVE WATER CLOSET	5	--
URINAL	5	--
COUNTER SINK	1.5	1.5
LAVATORY	1.5	1.5
MOP BASIN	2.25	2.25
WATER COOLER	.25	--

PROVIDE WATER HAMMER ARRESTERS BY SIOUX CHIEF, PRECISION PLUMBING PRODUCTS, WATTS OR APPROVED EQUAL WITH PISTON AND O-RING CONSTRUCTION HAVING PDI #WH-201, ASSE #1010 AND ANSI #A112.26.1M CERTIFICATION. INSTALL IN HORIZONTAL OR VERTICAL POSITION, BUT NEVER UPSIDE DOWN. INSTALL INLINE WITH WATER FLOW DIRECTION IF POSSIBLE. SIZE UNITS PER TABLES ABOVE.

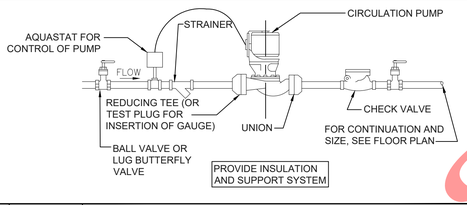
5 | SCALE N.T.S. | WATER HAMMER ARRESTOR

CONCEALED VALVES AND FITTINGS
* WRAP WITH 1-INCH THICK, 1-POUND DENSITY TO REQUIRED PIPE INSULATION THICKNESS
* SECURE WITH WIRE OR TAPE.
* VAPOR SEAL COLD WATER, CHILLED WATER AND STORM WATER PIPING.

CONCEALED VALVES AND FITTINGS
* PREMOLDED FIBER GLASS OR RADIAL MITERED PIPE INSULATION
* SKIM COAT OF INSULATION CEMENT
* COAT OF MASTIC
* WRAP WITH FIBER GLASS REINFORCING CLOTH.
* FINISH COAT OF MASTIC
* OVERLAP 2-INCHES ON PIPE INSULATION.

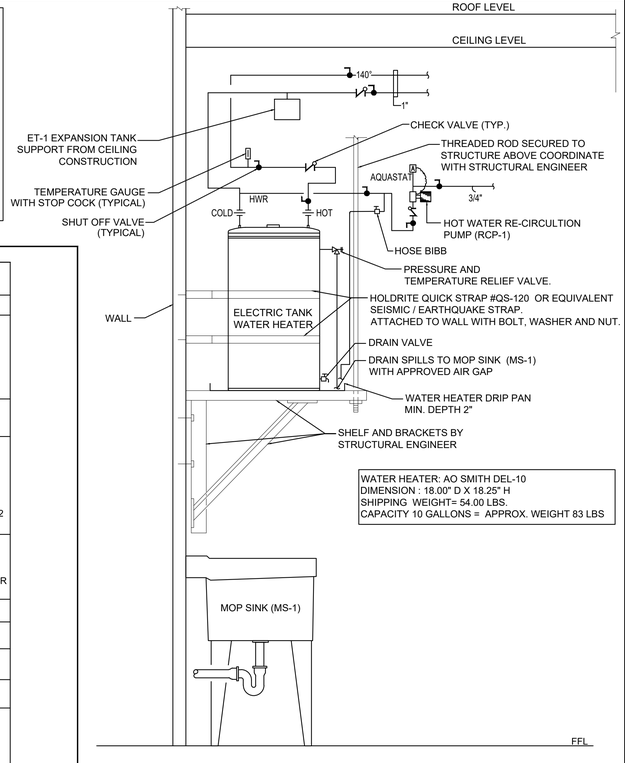


6 | SCALE N.T.S. | PIPE INSULATION DETAIL



7 | SCALE N.T.S. | INLINE RE-CIRCULATION PUMP DETAIL

NOTE:
1. CONTRACTOR TO COORDINATE WITH STRUCTURAL ENGINEER FOR WATER HEATER PLATFORM.
2. WATER HEATER STRAPPING SHALL BE AT POINT WITHIN THE UPPER ONE THIRD LOWER ONE-THIRD IF ITS VERTICAL DIMENSION. AT HE LOWER POINT, A MINIMUM (1/3) AND DISTANCE OF FOUR (4) INCHES SHALL BE MAINTAINED ABOVE THE CONTROLS WITH THE STRAPPING.
3. PROVIDE A MINIMUM 2-INCH DEEP, 24-GAUGE MINIMUM THICKNESS GALVANIZED SHEET METAL DRIP PAN UNDER WATER HEATER AND AT ALL LOCATIONS W/ LEAK DETECTION.



WATER HEATER: AO SMITH DEL-10
DIMENSION : 18.00" D X 18.25" H
SHIPPING WEIGHT= 54.00 LBS.
CAPACITY 10 GALLONS = APPROX. WEIGHT 83 LBS

8 | SCALE N.T.S. | WATER HEATER DETAIL

PLUMBING FIXTURE SCHEDULE

MARK	FIXTURE	MODEL NO	SAN.	VENT	C.W.	H.W.	REMARK
LAV-1	LAVATORY	AMERICAN STANDARD 0955.000	2"	1-1/2"	1/2"	1/2"	AMERICAN STANDARD LAVATORY MODEL #0955.000 AMERICAN STANDARD SHROUD/KNEE GUARD. MODEL 0059.020. AMERICAN STANDARD FAUCET MODEL #6059.105 - HARDWIRED. MCGUIRE - TRAP, MODEL #8902. MCQUIRE - GRID DRAIN MCGUIRE 155A. MCGUIRE SUPPLY 2165 LK 1/2" ANGLE SUPPLIES
WC-1	WATER CLOSET	AMERICAN STANDARD #2467.100	4"	2"	3/4"	-	MODEL #2647.100, CADET FLOWISE. RIGHT HEIGHT ELONGATED PRESSURE-ASSIST TOILET 1.1 GPF
SK-1	SINK	SINK PER ARCHITECT	2"	1-1/2"	1/2"	1/2"	CUSTOM SINK PROVIDED BY L'OCCITANE INSTALLED BY GC. TWO (2) FAUCETS - KINGSTON BRASS WIDESPREAD LAVATORY FAUCET WITH RETAIL POP-UP (FSC1970). BRUSHED BRASS FINISH. BRISTRO (RH-5300) ONE (1) FAUCET - MODEL TO BE DETERMINED BY CLIENT. FAUCET TO BE BRUSHED BRASS WITH SINGLE MOUNTING HOLE AND SINGLE LEVER. BRUSHED BRASS FINISH. FURNISH ALL FAUCETS WITH B-0199-06-F12 1.2 GPM VANDAL RESISTANT AERATOR
MS-1	MOP SINK	PROFLO PFLT2123 WITH LEGS	3"	2"	3/4"	3/4"	PROFLO MOP SINK MODEL #PFLT 2123 LEGS F/PFLT SET 4 WHITE #PFLTLEGS MUSTEE MOP SINK WALL MOUNT FAUCET MODEL #63.600A, HEAVY DUTY, ROUGH GRASS, CHROME PLATED WITH VACUUM BREAKER
FCO	FLOOR CLEANOUT	J.R. SMITH 4020	3"	-	-	-	DUCO CAST IRON CLEANOUT WITH ROUND ADJUSTABLE SCORIATED SECURED NICKEL BRONZE TOP.
WCO	WALL CLEANOUT	J.R. SMITH 4402	3"	-	-	-	DUCO CAST IRON CAULK FERRULE AND CAST IRON LEAD SEAL PLUG WITH STAINLESS STEEL ROUND COVER AND SCREW.
FD-1	FLOOR DRAIN	ZURN EZ-1 PV3	3"	2"	-	-	PROVIDE ZURN MODEL EZ-1 PV3 3" FLOOR DRAIN (FD-1) WITH TRAP PRIMER CONNECTION WATTS TP300.
TMV-1	MIXING VALVE	WATTS LFUSG-B	-	-	-	-	INSTALL LEAD-FREE ASSE 1070 COMPLIANT MIXING VALVE EQUAL TO WATTS LFUSG-B AND SET OUTLET TEMP TO 110°F
EWH-1	WATER HEATER	A O SMITH DEL-10	-	-	3/4"	3/4"	10-GALLON ELECTRIC WATER HEATER. 4.5 KW @ 480V. A.O. SMITH NO. DEL-10 OR EQUAL. PROVIDE DRAIN PAN UNDER SHELF-MOUNTED WATER HEATER TERMINATE DRAIN LINE IN MOP SINK. PROVIDE FULL SIZE T&P RELIEF LINE. TERMINATE 2" ABOVE RIM LEVEL OF MOP SINK. ALSO PROVIDE EXPANSION TANK (ET-1) AMTROL THERM-X-TROL ST-5C-DD. RE-CIRCULATION PUMP GRUNDFOS UP 15-10 BS - 1GPM @ 5FT HEAD (RCP-1). INSTALL PER MANUFACTURER'S INSTRUCTIONS.

NOTE:
1. CONTRACTOR TO CROSS REFERENCE ALL LISTED PLUMBING FIXTURES WITH OWNER PROVIDED DIP (DESIGN INTENT PACKAGE) TO ENSURE ALL PLUMBING RELATED ITEMS ARE COORDINATED PROPERLY.

Property of LV Engineering

L'OCCITANE
EN PROVENCE

TITLE:
PLUMBING SCHEDULE, SYMBOLS, AND DETAILS

SHEET NUMBER:
P-202

1 | PLUMBING SCHEDULE, SYMBOLS, AND DETAILS | N.T.S.

STATE OF CALIFORNIA
Domestic Water Heating System
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-PLB-E
Project Name: L'OCCITANE_Santa Rosa, CA	**Report Page:** (Page 1 of 7)
Project Address:	**Date Prepared:** 2025-08-12T05:50:03-04:00

This document is used to demonstrate compliance for nonresidential occupancies with requirements in 110.1, 110.3, 120.3, and 140.5, and with requirements in 141.0 for additions and alterations, for domestic water heating scopes using the prescriptive path. For high-rise residential and hotel/motel occupancies compliance is demonstrated with requirements in 110.1, 110.3, 160.4 and 170.2(d), and with requirements 180.1 for additions and 180.2 for alterations.

A. GENERAL INFORMATION

01	Project Location (city)	Santa Rosa	02	Climate Zone	2
03	Occupancy Types Within Project (select all that apply):				

● Retail

B. PROJECT SCOPE

This table includes domestic water heating systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive paths outlined in 140.5/ 170.2(d) and 141.0(a)/180.1, or 141.0(b)2N / 180.2 for additions or alterations. Solar water heating systems are documented on the NRCC-SAB compliance document. Combined hydronic water heating systems are documented on the NRCC-MCH compliance document.

01	02	03		
My project consists of (check all that apply):	System Type [1,2]	System Components		
☒ New system (DHW system being installed for the first time)	Individual System (serving nonresidential spaces)	☒ Equipment	☒ Distribution	☒ Controls
☐ System Alteration (equipment, distribution or controls)		☐ Equipment	☐ Distribution	☐ Controls

[1] *FOOTNOTES: Point of use water heaters, or other non-central systems used to serve nonresidential spaces, are considered individual systems.*
[2] *Dwelling units refers to hotel/motel guest rooms and units in a multifamily residential occupancy.*
[3] *DHW systems serving 2 or more dwelling units are considered "Central Systems" for multifamily occupancies*

C. COMPLIANCE RESULTS

Table C will indicate if the project data input into the compliance document is compliant with water heating requirements. If this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. or the table indicated as not compliant for guidance.

01	02	03	04
Domestic Hot Water Equipment	Distribution Systems	Controls	**Compliance Results**
Table F	Table G	Table H	
Yes	Yes	Yes	COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. DOMESTIC HOT WATER EQUIPMENT

This table is used to demonstrate compliance with mandatory equipment requirements in 110.1 and 110.3. Compliance with prescriptive requirements in 140.5(c) / 170.2(d) must also be demonstrated and with 141.0 / 180.1/ 180.2 for addition and alteration scopes.

Equipment Schedule: Water Heating Efficiency and Standby Loss

03	04			05		06		
System Name	EWH-1	Exception to 140.5(c)/170.2(d)3	Exceptions Do Not Apply	☐	Gas Service Water Heating System >= 1MMBtu/h[1]	Capacity-weighted Average Efficiency %		
07	08	09	10		11	12	13	14	15
Name or Item Tag	Equipment Type	Volume (gal)	Rated Input Capacity (Btu/h)	Max GPM/ First Hour Rating (FHR)	Rated Efficiency	Minimum Efficiency Required	Efficiency Unit	Designed Standby Loss	Maximum Standby Loss
EWH-1	Commercial Electric Storage Water Heater	10					3	3	3

[1] *FOOTNOTE: In systems >= 1MMBtu/h with multiple units, gas water heaters with input capacity > 100,000 Btu/h may meet 90% Et requirements via an input capacity-weighted average.*
[2] *FOOTNOTE: Compliant equipment may be found in the Modernized Appliance Efficiency Database System (MAEDBS) on the Energy Commission website: https://cacertappliances.energy.ca.gov/Pages/Search/AdvancedSearch.aspx*

Water Heating Equipment All Occupancies

	Yes	No	Not Applicable	Requirement
18	☒	☐	☐	Unfired storage tank insulation shall have Internal + External >=R-16 OR External >=R-3.5. Label required per 110.3(c)3
19	☐	☐	☒	New state buildings 60% of energy for service water heating from site solar energy or recovered energy per 110.3(c)5
20	☐	☐	☒	Isolation valves for instantaneous water heater with input rating >6.8 kBTUH or 2 kW has been specified per 110.3(c)6
21	☐	☐	☒	School buildings < 25,000 ft^2 and < 4 stories must install a heat pump water heating system per 140.5(a)1. Water heating systems serving an individual bathroom space may be an instantaneous electric water heater.

G. DOMESTIC HOT WATER DISTRIBUTION SYSTEM

This table is used to demonstrate compliance for nonresidential occupancies with distribution requirements in 120.3 and 140.5. For multifamily and hotel/motel occupancies, compliance is demonstrated with requirements 110.3(c), 160.4, 170.2(d).

Mandatory Pipe Insulation All Occupancies

13	☐	For systems serving dwelling units, pipe insulation must meet the minimum insulation requirements in Table 160.4-A (see blow) except: • Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration. Piping that penetrates metal framing shall use grommets, plugs, wrapping or other insulating material to assure that no contact is made with the metal framing. Insulation shall abut securely against all framing members • Piping installed in interior or exterior walls shall not be required to have pipe insulation if all of the requirements are met for compliance with Quality Insulation Installation (QII) as specified in the Reference Residential Appendix RA3.5. • Piping surrounded with a minimum of 1 inch of wall insulation, 2 inches of crawlspace insulation, or 4 inches of attic insulation, shall not be required to have pipe insulation.
14	☒	For systems serving nonresidential spaces, pipe insulation for the following applications is specified to comply with Table 120.3-A (see below) per 120.3: • Recirculating system piping, including supply and return piping of the water heater • The first 8 ft of hot and cold outlet piping, including between storage tank and heat trap, for a nonrecirculating storage system • Pipes that are externally heated
15	☒	Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather shall be installed with a cover suitable for outdoor service per 120.3(b) / 160.4(f). Pipe insulation buried below grade must be installed in a water proof and non-crushable casing or sleeve.

TABLE 120.3-A / 160.4-A PIPE INSULATION THICKNESS

Fluid Temperature Range (°F)	Conductivity Range (Btu-in per hour per ft^2 per °F)	Insulation Mean Rating Temp (°F)	Nominal Pipe Diameter (in)			
			< 1	1 to < 1.5	1.5 to < 4	1.5 to < 4 Multifamily & Hotel/Motel
			Minimum Insulation Required			
105-140	0.22 - 0.28	100	1.0 in or R-7.7	1.5 in or R-12.5	1.5 in or R-11	2.0 in or R-16

H. DOMESTIC HOT WATER CONTROLS

This table is used to demonstrate compliance with control requirements in 110.3 for all occupancies. For multifamily residential and hotel/motel occupancies, compliance is also demonstrated with requirements in 160.4(e) / 170.2(d).

	Yes	No	Not Applicable	Requirement
01	☒	☐	☐	Construction documents require manufacturer certification that service water-heating systems are equipped with automatic temperature controls capable of adjusting temperature settings per 110.3(a).
02	☐	☐	☒	Systems with capacity > 167,000 BTUH equipped with outlet temperature controls per 110.3(c)1 unless covered by California Plumbing Code 613.0.
03	☒	☐	☐	Controls for circulating pumps or electrical heat trace systems are capable of automatically turning off the system per §110.3(c)2 unless systems serves healthcare facility.
04	☐	☐	☒	For recirculation systems serving multiple dwelling units, design includes automatic pump controls per 170.2(d) or 180.1(b)3 for additions.
05	☐	☐	☒	For recirculation systems serving individual dwelling units, design includes manual on/off controls as specified in Reference Appendix RA4.4.9 per 170.2(d).
06	☐	☐	☒	Combustion air positive shut-off shall be provided per 160.4(3).on all newly installed commercial boilers as follows: • Boilers with input capacity >= 2.5 MMBtu/h, in which the boiler is designed to operate with a nonpositive vent static pressure • Boilers where one stack serves two or more boilers with a total combined input capacity per stack of 2.5 MMBtu/h.
07	☐	☐	☒	Boiler combustion air fans with motor >= 10 hp shall meet one of the following • The fan motor shall be driven by a variable speed drive OR • The fan motor shall include controls that limit the fan motor demand to <=30% of the total design wattage at 50% of the design air volume.
08	☐	☐	☒	Newly installed boilers with an input capacity (d-gte/) 5MMBtu/h and a steady state full-load combustion efficiency < 90% shall maintain excess (stack-gas) oxygen concentrations <= 5% by volume on a dry basis over firing rates of 20-100%. Combustion air volume shall be controlled with respect to firing rate or flue gas oxygen concentration. Use of a common gas and combustion air control linkage or jack shaft is prohibited.

I. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-PLB-E - Must be submitted for all buildings

J. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

There are no forms required for this project.

K. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION

There are no forms required for this project.

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Michael Tobias	Documentation Author Signature:
Company: NY Engineers	Signature Date:
Address: 382 NE 191 ST Street Suite 49674	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: Miami, FL 33179	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

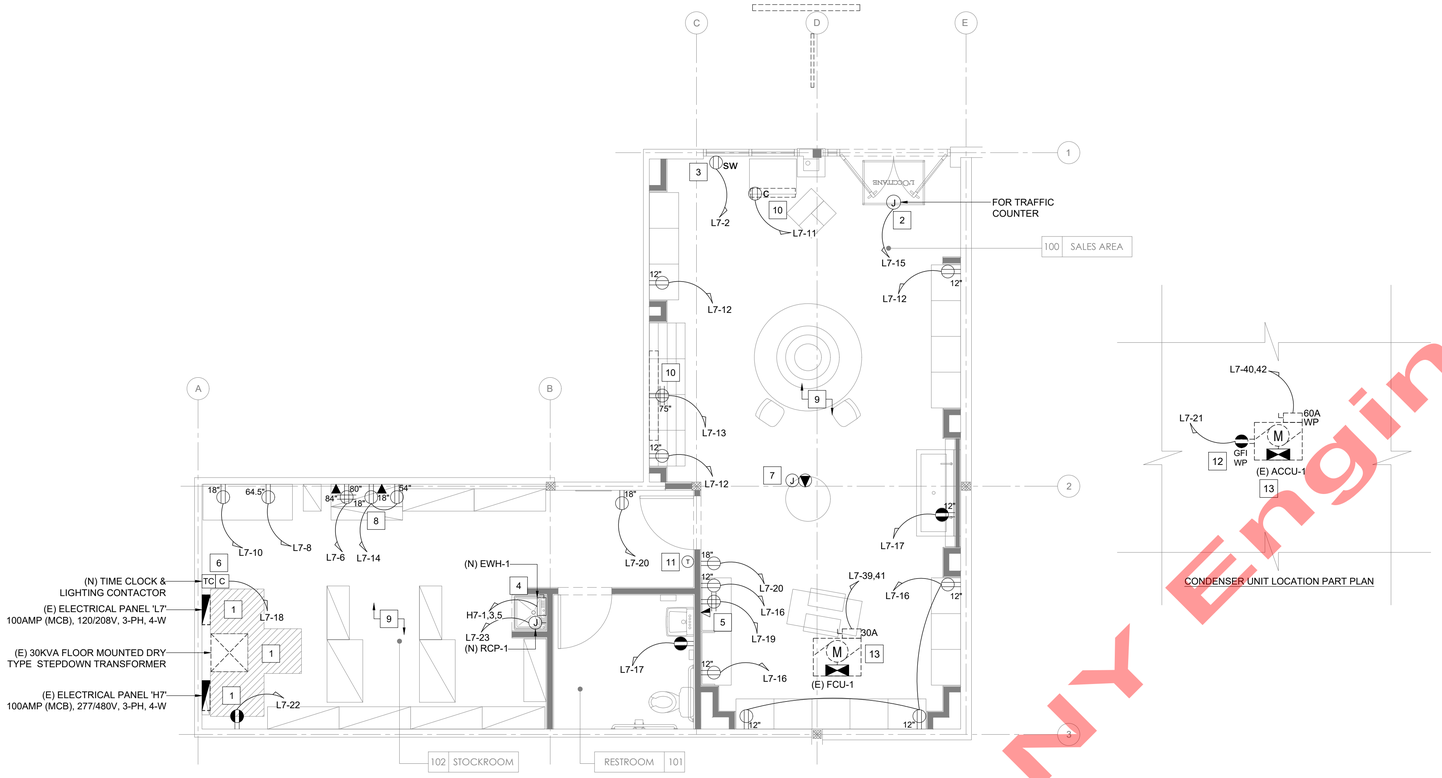
Responsible Designer Name: Michael Tobias	Responsible Designer Signature:
Company: NY Engineers	Date Signed:
Address: 382 NE 191 ST Street Suite 49674	License:
City/State/Zip: Miami, FL 33179	Phone:

Property of NY Engineers

L'OCCITANE
EN PROVENCE

TITLE:
TITLE-24

SHEET NUMBER:
P-300



CONDENSER UNIT LOCATION PART PLAN

1 ELECTRICAL POWER PLAN
1/4" = 1'-0"

KEY NOTES

1. EXISTING ELECTRICAL PANELS 'H7' AND 'L7' WITH 30KVA FLOOR MOUNTED TRANSFORMER SHALL REMAIN. LANDLORD'S CONTRACTOR SHALL COORDINATE WITH LANDLORD AND VERIFY IN THE FIELD THE EXACT LOCATION, RATING, VOLTAGE, PHASE, AND OPERABLE CONDITION OF EXISTING EQUIPMENT. REPLACE WITH NEW IF FOUND INOPERABLE. BASE BID ACCORDINGLY. MAINTAIN CLEARANCE FOR ELECTRICAL PANEL PER CEC 110.26 (A) (1). REFER TO SHEET E-300 ELECTRICAL RISER DIAGRAM FOR MORE INFORMATION.
2. PROVIDE JUNCTION BOX FOR TRAFFIC COUNTER. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE ARCHITECT FOR THE EXACT LOCATION, MOUNTING HEIGHT AND ELECTRICAL REQUIREMENTS PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED.
3. PROVIDE A NEW SHOW WINDOW RECEPTACLE ABOVE THE WINDOW ON THE WALL OR CEILING AS REQUIRED TO MEET CEC 210.62 SHOW WINDOW REQUIREMENTS. COORDINATE THE EXACT LOCATION WITH THE ARCHITECT/OWNER. CONTRACTOR TO FIELD VERIFY THE EXISTING SHOW WINDOW RECEPTACLE AVAILABILITY & OPERABLE CONDITION. REUSE IF POSSIBLE; OTHERWISE PROVIDE NEW AS SHOWN ON PLAN.
4. ALL PLUMBING EQUIPMENT (WATER HEATER) SHALL BE PROVIDED WITH THE REQUIRED ROUGH-INS, MOCP, AND WIRE SIZE REQUIREMENTS. THE ELECTRICAL CONTRACTOR MUST COORDINATE WITH THE MANUFACTURER FOR THE EXACT TYPE OF ROUGH-INS AND WIRE SIZE BEFORE THE COMMENCEMENT OF WORK.
5. NEW POS SYSTEM. PROVIDE RECESSED QUAD RECEPTACLE AND TELE/DATA OUTLET FOR POS SYSTEM. INSTALL (4) NEW DROPS OF CAT 6 CABLES. CONTRACTOR TO COORDINATED EXACT MOUNTING HEIGHT AND LOCATION WITH ARCHITECT/OWNER IN FIELD PRIOR TO ROUGH-IN. BASE BID ACCORDINGLY.
6. NEW TIME CLOCK/LIGHTING CONTACTOR FOR AUTOMATIC CONTROL OF SPACE LIGHTING CIRCUITS & WIRED TO AN OVERRIDE SWITCH/TIMER AS REQUIRED. ELECTRICAL CONTRACTOR SHALL COORDINATE ACCORDINGLY AND PROVIDE ALL REQUIRED WIRING FOR LIGHTING BRANCH CIRCUITS.
7. WIRELESS ACCESS POINT (WAP) ABOVE CEILING. PROVIDE DATA DROP AND POWER. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE ARCHITECT/OWNER FOR THE EXACT LOCATION AND MOUNTING HEIGHT, PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. △2
8. RECEPTACLES AND DATA OUTLETS FOR MANAGER DESK. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE ARCHITECT/OWNER FOR THE EXACT LOCATION. MOUNTING HEIGHT (AS PER CBC, SECTION 11B-308, MOUNTING HEIGHT SHOULD BE MINIMUM 15" A.F.F. TO THE BOTTOM OF THE OUTLET BOX AND MAXIMUM 48" A.F.F. TO THE TOP OF THE OUTLET BOX, U.N.O.) AND ELECTRICAL REQUIREMENTS PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED.
9. REMOVE ALL EXISTING CAT 6 CABLES THROUGHOUT THE PROJECT SPACE. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH ARCHITECT/OWNER. BASE BID ACCORDINGLY.
10. PROVIDE QUAD OUTLET AT 75" A.F.F AND DUPLEX CEILING MOUNTED OUTLET FOR LIGHT BOX. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE ARCHITECT FOR THE EXACT LOCATION, MOUNTING HEIGHT, AND ELECTRICAL REQUIREMENTS PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED.
11. E.C TO PROVIDE CONDUIT WITH PULL STRING FROM THERMOSTAT AND SENSOR (AS REQUIRED) TO MECHANICAL UNIT. VERIFY EXACT LOCATION WITH MECHANICAL CONTRACTOR/LANDLORD IN THE FIELD.
12. ALL OUTDOOR ELECTRICAL EQUIPMENT SHALL BE NEMA 3R RATED. CONTRACTOR SHALL FIELD VERIFY IF A RECEPTACLE IS PRESENT WITHIN 25 FT OF EACH EXISTING HVAC UNIT. IF PRESENT, THE EXISTING RECEPTACLE SHALL CONNECT TO A NEW AVAILABLE CIRCUIT AS SHOWN. ELSE PROVIDE A NEW WEATHERPROOF, GFCI PROTECTED, 120V, 20A RECEPTACLE WITHIN 25 FT OF THE HVAC UNIT.
13. EXISTING HVAC UNIT TO REMAIN. UTILIZE EXISTING DISCONNECT IF IT'S IN OPERABLE CONDITION, OTHERWISE PROVIDE NEW. PROVIDE NEW FEEDER AND CONDUIT TO THE ELECTRIC PANEL AS SHOWN. ELECTRICAL CONTRACTOR TO COORDINATE EXACT ELECTRICAL REQUIREMENT & LOCATION WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. BASE BID ACCORDINGLY.

GENERAL NOTES

1. ALL MILLWORK (UNLESS NOTED OTHERWISE) INCLUDING HARDWARE TO BE FURNISHED BY CLIENT AND INSTALLED BY G.C.
2. G.C. TO PROVIDE BLOCKING FOR WALL FIXTURES AS REQUIRED. REFER TO SHOP DWGS FOR EXACT DIMENSIONS.
3. ALL WOODWORK ATTACHED TO THE PREMISES, BLOCKING, GROUNDS, ETC. SHALL BE FIRE RETARDANT AND COMPLY WITH THE LANDLORD'S FIREPROOF GOVERNING BUILDING CODE REQUIREMENTS (IF APPLICABLE).
4. REFER TO SHOP DWGS DRAWINGS FOR LOCATION OF FIXTURE OUTLETS.
5. G.C. TO PROVIDE CONDUIT FOR DATA, POWER, PHONE ETC. FOR POS SYSTEM.
6. G.C. TO INSTALL L'OCCITANE SIGN PER LANDLORD CRITERIA. SIGN TO BE PROVIDED BY VENDOR. G.C. SHALL PROVIDE REQUIRED BLOCKING AND POWER. ALL SIGNAGE SHALL BE WIRED THROUGH A TIME CLOCK/PHOTOCELL CONTROL.
7. FOR ALL ELECTRICAL OUTLETS, REFER TO ARCHITECTURAL POWER PLAN.
8. G.C. TO VERIFY EXACT LOCATION OF ALL EXISTING STRUCTURAL COLUMN(S) AND TO NOTIFY ARCHITECT OF ANY DISCREPANCIES /CONFLICTS PRIOR TO COMMENCING WORK.
9. ALL EXISTING OUTLETS TO BE REMOVED, SHALL BE PATCHED FLUSH WITH ADJACENT WALL SURFACES. EXCEPT WHERE NOTED, ALL ELECTRICAL, TELEPHONE, AND DATA OUTLETS ARE TO BE MOUNTED VERTICALLY 18" A.F.F.
10. CENTERLINE TO CENTERLINE DIMENSIONS OF ANY OUTLET PAIR OR GROUP SHALL NOT EXCEED 6". △2
11. PROVIDE MINIMUM 20% SPARE CIRCUITS IN EXISTING ELECTRICAL PANEL. PROVIDE BREAKER LOCKOUTS FOR A.C. UNITS AND SEPARATE CIRCUIT OUTLETS AT TELEPHONE EQUIPMENT.
12. LANDLORD PANELS AND BRANCH CIRCUITS IN PANELS SHALL BE LABELED IN A CLEAR LEGIBLE MANNER.
13. ALL WORK MATERIALS AND EQUIPMENT TO BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE.
14. ALL OUTLETS SHALL BE INSTALLED AS DIMENSIONED ON THIS PLAN. ANY DISCREPANCIES AS TO THE LOCATION BETWEEN PLAN AND EXISTING FIELD CONDITIONS SHALL BE CLARIFIED WITH THE ARCHITECT BEFORE COMMENCEMENT OF WORK.
15. ALL ELECTRICAL AND TELEPHONE WORK SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE ELECTRICAL CODE. NATIONAL BOARD OF FIRE UNDERWRITERS, PUBLIC UTILITIES COMPANY, TELEPHONE COMPANY, AND ALL OTHER AUTHORITIES HAVING JURISDICTION.
16. ALL NEW ELECTRICAL OR TELEPHONE OUTLETS SHALL BE RECESSED MOUNTED. THERE SHALL BE NO NEW SURFACE MOUNTED CONDUIT OR OUTLETS.
17. IT IS THE INTENT OF THESE PLANS TO PROVIDE A COMPLETE OPERATING ELECTRICAL SYSTEM. G.C. SHALL FURNISH AND INSTALL WIRING, EQUIPMENT ETC. REQUIRED.
18. ALL WIRING INSTALLED UNDER THIS CONTRACT SHALL BE TESTED FOR PROPER CONNECTIONS, SHORT CIRCUITS AND GROUNDS PRIOR TO TURNING OVER WORK AS A COMPLETE UNIT.
19. SEE COLOR REFERENCE NOTE ON ARCHITECTURAL PLAN FOR OUTLET COVER PLATE SPECIFICATION INFORMATION.
20. THE E.C. SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL ELECTRICAL WIRING, OUTLET INSTALLATION, AND CONNECTION OF POWER FEED OUTLET BOX AT ALL LOCATIONS.
21. OUTLETS & WALL PLATES COLOR REF. ALL NEW ELECTRICAL OUTLETS AND WALL PLATES IN SALES AREA SHALL BE 'LUTRON 'DECORA' STYLE W/ 'DESIGNER' COLOR WALL PLATES. ALL OUTLETS TO BE "SNOW WHITE" UNLESS NOTED OTHERWISE.
26. G.C. TO VERIFY LOSS PREVENTION SYSTEM REQUIREMENTS W/P.M. G.C. TO COORDINATE ON SITE AS NECESSARY.
27. ALL CABLE LOCATED IN RETURN AIR PLENUM SHALL BE PLENUM RATED.
28. ALL CABLE LOCATED IN RETURN AIR PLENUM SHALL BE PLENUM LOCATIONS TO THE I.T. CABINET TELE/DATA PATCH PANEL IN THE STOCK ROOM (TYP.) TERMINATION PROVIDED BY L'OCCITANE VENDOR.
29. G.C. TO RUN LINES FROM THE SPECIFIED NETWORK JACK LOCATIONS TO THE I.T. CABINET TELE/DATA PATCH PANEL IN THE STOCK ROOM (TYP.) TERMINATION PROVIDED BY L'OCCITANE VENDOR.

ELECTRICAL LEGEND △2

SYMBOL	DESCRIPTION
	HOME RUN.
	DUPLEX RECEPTACLE @ MIN. 15" A.F.F. & MAX. 48" A.F.F. U.N.O. MOUNTED AT CODE HEIGHT.
	DEDICATED GROUND FAULT PROTECTED DUPLEX RECEPTACLE.
	QUAD RECEPTACLE @ MIN. 15" A.F.F. & MAX. 48" A.F.F., U.N.O. MOUNTED AT CODE HEIGHT.
USB	USB/ DUPLEX COMBINATION RECEPTACLE
SW	SHOW WINDOW OUTLET
	SINGLE OUTLET/SPECIAL RECEPTACLE
	FLOOR QUAD
	WALL / CEILING DATA RECEPTACLE AT MIN. 15" A.F.F. & MAX. 48" A.F.F., U.N.O.
	TELEPHONE / DATA COMBINATION RECEPTACLE AT MIN. 15" A.F.F. & MAX. 48" A.F.F., U.N.O.
	FLOOR TELEPHONE / DATA COMBINATION RECEPT.
T	THERMOSTAT AT MAX. 48" A.F.F., U.N.O.
SM	MOTOR RATED TOGGLE SWITCH
M	MOTOR LOAD
$	LIGHT SWITCH. AT MAX. 48" A.F.F., U.N.O.
SMS	WALL MOUNTED OCCUPANCY SENSOR AT MAX. 48" A.F.F., U.N.O.
OS	CEILING MOUNTED OCCUPANCY SENSOR.
J	CEILINGS / WALL MOUNTED JUNCTION BOX.
	DISCONNECT SWITCH.
	ELECTRICAL PANEL.
DL	FLOOR / CEILING DUPLEX RECEPTACLE
	SPEAKER
NOTE:	NOT ALL SYMBOLS MAY APPEAR ON DRAWINGS.

NOTE:
ALL WIRES TO BE COPPER AND IN CONDUIT, INCLUDING LOW VOLTAGE

ALL MECHANICAL/HVAC EQUIPMENT TO REMAIN. UTILIZED EXISTING CIRCUIT, VERIFY IN FIELD. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.

ALL RECEPTACLES WITHOUT TAG (E) ARE NEW TO BE PROVIDED AND INSTALLED BY CONTRACTOR.

NOTE:
WHERE CEILINGS DO NOT EXIST TO STUB CONDUITS ABOVE FOR LOW VOLTAGE, CONDUITS SHALL BE STUBBED UP TO BOTTOM OF / ABOVE STRUCTURE ABOVE. IN FINISHED AREAS, PROVIDE COMPLETE CONDUIT PATHWAYS, INCLUDING PULL-BOXES, UNLESS OTHERWISE DIRECTED. CONDUIT, JUNCTION BOXES AND THE LIKE SHALL BE PAINTED TO MATCH AREA FINISHES. ALL CONDUIT SHALL BE ROUTED IN STRAIGHT RUNS WITH 90 DEGREE BENDS.

WHERE HARD INACCESSIBLE CEILINGS EXIST, PROVIDE COMPLETE CONTINUOUS CONDUIT PATHWAYS, INCLUDING PULL-BOXES, AND ACCESS PANELS, FOR LOW VOLTAGE UNLESS OTHERWISE DIRECTED. PROVIDE CONDUIT SLEEVES TRAVERSING OVER INACCESSIBLE CEILINGS BETWEEN AREAS WITH ACCESSIBLE CEILINGS, AS REQUIRED. VERIFY JUNCTION BOXES ABOVE INACCESSIBLE CEILINGS ARE WITHIN REACH OF THE ACCESS PANEL AND CAN BE ACCESSIBLE PER C.E.C. AND LOCAL CODE

ALL OUTLETS TO BE WHITE.
(E) - EXISTING
(C) - CEILING MOUNTED
(R) - EXISTING/RELOCATED
(F) - FLOOR MOUNTED

△2

NOTE:
AS PER CBC, SECTION 11B-308, ALL ELECTRICAL SWITCHES AND ELECTRICAL RECEPTACLES ARE MOUNTED AT HEIGHT MINIMUM 15" A.F.F. TO THE BOTTOM OF THE OUTLET BOX AND MAXIMUM 48" A.F.F. TO THE TOP OF THE OUTLET BOX, U.N.O.

ABBRIVIATIONS

A	AMPERE	MCA	MINIMUM CIRCUIT AMPS
AC	ABOVE COUNTER	MCB	MAIN CIRCUIT BREAKER
AFF	ABOVE FINISHED FLOOR	MCC	MOTOR CONTROL CENTER
AFG	ABOVE FINISHED GRADE	MCCB	MOLDED CASE CIRCUIT BREAKER
AHJ	AUTHORITY HAVING JURISDICTION	MCP	MOTOR CIRCUIT PROTECTOR
AFC	AVAILABLE FAULT CURRENT	MDP	MAIN DISTRIBUTION PANEL
AIC	AMPERE INTERRUPTING CAPACITY	MFS	MAXIMUM FUSE SIZE
ATS	AUTOMATIC TRANSFER SWITCH	MLO	MAIN LUG ONLY
BC	BELOW CEILING	MOCP	MAXIMUM OVERCURRENT PROTECTION
BLDG	BUILDING	MTD	MOUNTED
BRKR	BREAKER	MTS	MANUAL TRANSFER SWITCH
C	CONDUIT (PROVIDE PULL STRING IN ALL EMPTY CONDUIT)	N	NEW
		N.C.	NORMALLY CLOSED
CL	CURRENT LIMITER	N.O.	NORMALLY OPEN
CKT	CIRCUIT	NTS	NOT TO SCALE
CLG	CEILING.	OCPD	OVERCURRENT PROTECTION DEVICE
CT	CURRENT TRANSFORMER	OH	OVERHEAD
CU	COPPER	P	POLE
CTR	CENTER	PH	PHASE
E	EXISTING	PNL	PANEL
EA	EACH	PWR	POWER
EGC	EQUIPMENT GROUNDING CONDUCTOR	R	RELOCATED
EOL	ELECTRONIC OVERLOAD	REC	RECEPTACLE
FBO	FURNISHED BY OTHERS	RM	ROOM
FDR	FEEDER	SW	SWITCH
FLA	FULL LOAD AMPS	SWBR	SWITCHBOARD
FPMR	FUSE PER MANUFACTURER'S RECOMMENDATION	SWGR	SWITCHGEAR
		TBB	TELECOM BACKBOARD
GEC	GROUNDING ELECTRODE CONDUCTOR	TELE	TELEPHONE
GFI	GROUND FAULT INTERRUPTER	TYP	TYPICAL
GND	GROUND	UG	UNDERGROUND
GRS	GALVANIZED RIGID STEEL	U.N.O.	UNLESS NOTED OTHERWISE
HOA	HAND-OFF-AUTO	UPS	UNINTERRUPTIBLE POWER SUPPLY
IG	ISOLATED GROUND	V	VOLT
JB	JUNCTION BOX	VIF	VERIFY IN FIELD
KVA	KILOVOLT-AMPERE	W/	WITH
KW	KILOWATT	W	WIRE
L.S.I.G.	LONG, SHORT, INSTANTANEOUS, GROUND FAULT TRIP	WP	WEATHER PROOF
		XFMR	TRANSFORMER
LTG	LIGHTING		

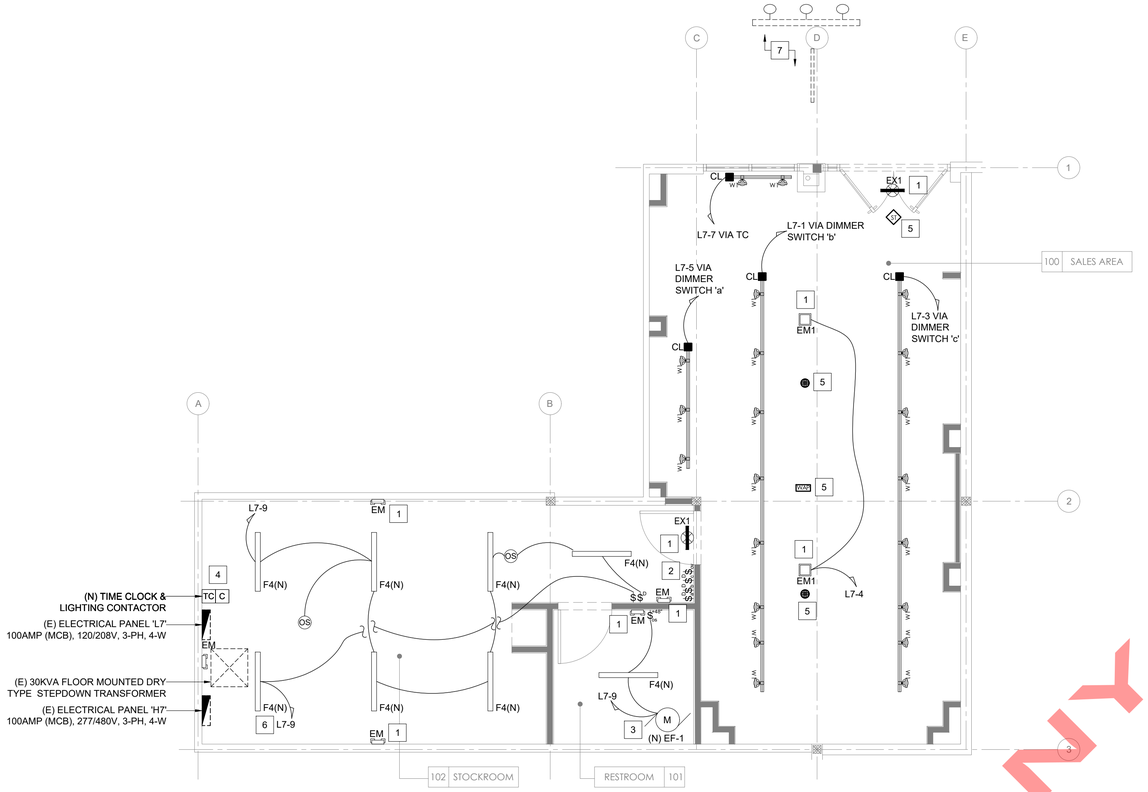
L'OCCITANE
EN PROVENCE

TITLE:
ELECTRICAL POWER PLAN

SHEET NUMBER:
E-100

Property of NY Engineers

LEGEND:
NEW
EXISTING



1 ELECTRICAL LIGHTING PLAN
1/4" = 1'-0"

GENERAL NOTES

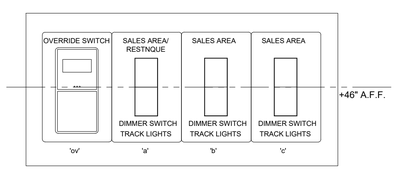
1. ALL ELECTRICAL WORK SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE CALIFORNIA ELECTRICAL CODE OR LOCAL CODE AND/OR OTHER AUTHORITIES HAVING JURISDICTION.
2. THE CONTRACTOR SHALL VISIT THE PROJECT SITE, REVIEW EXISTING CONDITIONS AGAINST THE PLANS, AND FAMILIARIZE HIMSELF WITH THE WORK PRIOR TO BIDDING AND START OF WORK.
3. SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION AND QUANTITY OF LIGHTING FIXTURES.
4. EMERGENCY AND EXIT LIGHTS SHALL BE INSTALLED AND CIRCUITED PER LATEST CALIFORNIA ELECTRICAL CODE AND ALL LOCAL CODES. ALL EMERGENCY AND EXIT FIXTURES SHALL HAVE A MINIMUM 90-MINUTE BATTERY BACK-UP.
5. ELECTRICAL CONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS AS REQUIRED FOR A FULLY COMPLETE AND OPERABLE SYSTEM.
6. ALL EQUIPMENT SHALL HAVE UL OR CSA LABELS.
7. G.C. IS RESPONSIBLE FOR ALL FINAL CONNECTIONS, TERMINATIONS, AND COORDINATION IN ALL MILLWORK FIXTURES.
8. ELECTRICAL CONTRACTOR'S BID SHALL INCLUDE INSTALLATION OF ALL LIGHT FIXTURES AND ASSOCIATED LAMPS. SOME FIXTURES REQUIRE ASSEMBLY, E.C. IS RESPONSIBLE TO ENSURE THE ADJUSTABILITY OF ALL DIRECTIONAL FIXTURES AFTER INSTALLATION AND SHALL AIM FIXTURES PER DIRECTION FROM OWNER. IF THE CEILING SYSTEMS ARE FIRE RATED, E.C. SHALL CLOSELY COORDINATE RECESSED FIXTURE REQUIREMENT WITH OWNER AND SUPPLIER TO MAINTAIN THE FIRE RATING OF THE CEILING.
9. ALL FIXTURES INSTALLED OUTDOORS SHALL BE RATED FOR DAMP/WET LOCATIONS AS REQUIRED. THE CONTRACTOR SHALL COORDINATE DAMP/WET LOCATION RATING PER CEC ARTICLE 410.10 (A). ALL INSTALLATIONS SHALL CONFORM TO CEC ARTICLE 410, ALL SUB ARTICLES. ALL FLUORESCENT FIXTURES THAT UTILIZE DOUBLE ENDED LAMPS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE SHALL BE CODE COMPLIANT WITH CEC 410.130(G)
10. THE ELECTRICAL LIGHTING INSTALLATIONS SHALL CONFORM TO ALL STATE AND LOCAL SEISMIC AND CODE REQUIREMENTS REGARDING LIGHT FIXTURE SUPPORT. ALL ELECTRICAL METALLIC TUBING (EMT), RIGID NON-METALLIC CONDUITS, "SEAL TIGHT" TYPE CONDUITS AND ALL OTHER CONDUITS THAT DO NOT CONTAIN A CODE SIZED GROUND WIRE SHALL HAVE A CODE SIZED BOND WIRE INSTALLED WITH THE CIRCUIT CONDUCTORS.
11. ELECTRICAL EQUIPMENT AND SUPPORT SYSTEMS BEING INSTALLED SHALL BE RATED TO COMPLY WITH PROJECT VIBRATION AND SEISMIC CONTROL REQUIREMENTS.
12. PROVIDE POWER AND WIRING TO SPEAKER RUNS TO STOCK ROOM, SPEAKER LAYOUT, QUANTITIES AND SPECIFICATIONS AS DETERMINED BY AUDIO CONSULTANT SHALL BE COORDINATED WITH OWNER AND ARCHITECT.
13. ALL ABOVE CEILING OR IN-WALL CONDUIT FOR STOREFRONT LIGHTS TO BE FIRE RATED.
14. ALL CEILINGS SHALL BE SUSPENDED FROM PURLINS, TOP CHORD OF BAR JOISTS, BEAMS AND/OR FLOOR DECKING. NO ATTACHMENT TO ROOF DECKING WILL BE PERMITTED.
15. G.C. IS RESPONSIBLE FOR PROVIDING ACCESS PANELS THROUGHOUT THE LEASED PREMISES. G.C. SHALL AT MINIMUM PROVIDE 24" X 24" FLUSH MOUNT ACCESS TO PANELS IN THE CEILING WITHIN THE LEASED PREMISES AT DAMPERS, HVAC EQUIPMENT AND ELSEWHERE AS REQUIRED BY LANDLORD OR AS REQUIRED BY CODE IN ORDER TO PROVIDE ACCESS TO EQUIPMENT.
16. EXIT AND EMERGENCY LIGHT FIXTURE TYPES AND LOCATIONS ARE SUBJECT TO BUILDING DEPARTMENT AND FIRE DEPARTMENT APPROVAL. PROVIDE FIXTURE SUPPORTS AS REQUIRED.
17. SEE MILLWORK DRAWINGS FOR ALL MILLWORK LIGHTING.
18. ALL IN-WALL CONDUIT FOR FIXTURE AND STOREFRONT LIGHTING TO BE FIRE RATED.
19. ELECTRICAL CONTRACTOR MUST PROVIDE AN IDENTIFICATION NAMEPLATE ON TENANT'S MAIN ELECTRICAL SERVICE FUSIBLE DISCONNECT SWITCH IN LANDLORD'S DISTRIBUTION PANEL. NAMEPLATE MUST BE 1/8" THICK PLASTIC, BLACK ON WHITE ETCHED TO LEAVE WHITE LETTERS. THE SIZE SHALL BE ONE INCH HIGH BY REQUIRED LENGTH, WITH TENANT'S SPACE NUMBER ENGRAVED ON IT. PERMANENTLY AFFIX TO DISTRIBUTION PANEL..
20. IF REQUIRED, ALL LIGHT FIXTURES SHALL BE TENTED IN ACCORDANCE WITH UNDERWRITERS' LABORATORIES #P231.
21. FINAL CONNECTIONS TO LIGHT FIXTURES SHALL BE MADE WITH GREENFIELD FLEXIBLE CONDUIT. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL BE 6'-0".

LIGHT FIXTURE SCHEDULE

SYMBOL	LABEL	TYPE	MFR	MODEL NUMBER	VOLTS	WATTS	QUANTITY	DESCRIPTION
	F4	LED	MERCURY LIGHTING	MP68232OCTASWELB120V	120V	32W	8	2/32W 4' DECOR FLUOR WALL/CLG FIXT ELB UNIV
	EM1	LED	ENCORE	EMR-12-100-250-PT	120V	50W	2	EMERGENCY LIGHT DUAL HEAD, RECESSED, CONCEALED
	W1	LED	LUCENT	1CT/3CT	120V	14.6W	21	PROSPEX TUBELED MINI 7100-LED-SP
	EM	LED	LITHONIA	EU2CM6	120V	0.5W	5	EMERGENCY LIGHT
	EX1	LED	ENCORE	EC16RWWU, 6" GREEN LETTERS ON EDGE LIT CLEAR ACRYLIC, WHITE TRIM	120V	2W	2	RECESSED EXIT SIGN

NOTE:
GC TO PROVIDE WIRING FOR SPEAKERS AND NETWORK ETHERNET ONLY. ALL OTHER LOW VOLTAGE PROVIDED AND INSTALLED BY PARTNER VENDOR. GC TO COORDINATE WITH PROJECT ARCHITECT AND TENANT.

NEW LIGHTING DIMMER SWITCHBANK



'a,b,c' - SINGLE POLE DIMMER SWITCHES FOR CONTROL OF SALES LIGHTING.

'ov' - 2-HR OVERRIDE BYPASS SWITCH. ADJUST TO ON/OFF SCHEDULE DIRECTED BY TENANT REPRESENTATIVE.

NOTE:
CONTRACTOR SHALL COORDINATE IN THE FIELD WITH THE ARCHITECT/OWNER FOR THE EXACT REQUIREMENTS OF THE CUSTOM COVER PLATE (LUTRON #NT-SSSS-NFB) AND FLUORESCENT DIMMER (LUTRON #NTF-10) PRIOR TO ROUGH-IN.

KEY NOTES

1. ALL NEW EXIT SIGNS & EMERGENCY LIGHTS TO BE CONNECTED TO LOCAL LIGHTING CIRCUIT AHEAD OF SWITCHING.
2. NEW MASTER DIMMER SWITCH BANK LOCATION. DIMMER SWITCHES SHALL BE RATED FOR A TOTAL LOAD OF SWITCHED CIRCUIT AND LAMP TYPE AS REQUIRED. DIMMERS SHALL BE PROVIDED WITH AN ON/OFF SWITCH. SEE DETAIL IN THIS SHEET FOR ADDITIONAL INFORMATION. VERIFY/CONFIRM LOCATION/MOUNTING HEIGHT WITH OWNER/ARCHITECT PRIOR TO INSTALLATION AND ROUGH-IN.
3. EXHAUST FAN INTERLOCKED WITH LIGHT SWITCH. SEE MECHANICAL DRAWINGS FOR MORE INFORMATION AND SPECIFICATIONS. ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT MOUNTING HEIGHT AND LOCATION WITH ARCHITECT/OWNER IN FIELD.
4. NEW TIME CLOCK/LIGHTING CONTACTOR FOR AUTOMATIC CONTROL OF SPACE LIGHTING CIRCUITS & WIRED TO AN OVERRIDE SWITCH/TIMER AS REQUIRED. ELECTRICAL CONTRACTOR SHALL COORDINATE ACCORDINGLY AND PROVIDE ALL REQUIRED WIRING FOR LIGHTING BRANCH CIRCUITS.
5. NEW SPEAKERS, TRAFFIC COUNTER AND WAP IN SALES AREA. G.C. TO VERIFY/CONFIRM LOCATION & ELECTRICAL POWER REQUIREMENTS WITH OWNER/LV VENDOR PRIOR TO INSTALLATION AND ROUGH-IN. BASE BID ACCORDINGLY.
6. THIS LIGHT FIXTURE SHALL NOT BE CONTROLLED BY AUTOMATIC MEANS ONLY AS PER 110.26(D).
7. THE EXTERIOR LIGHTING AND SIGNAGE SHALL BE WIRED THROUGH TIME CLOCK/PHOTOCELL. G.C. SHALL COORDINATE WITH LANDLORD FOR THE EXACT LOCATION OF THE LIGHT FIXTURES AND ITS CONTROLS IN FIELD. PROVIDE CIRCUITING & POWER PROVISION AS REQUIRED. BASE BID ACCORDINGLY.

LEGEND

OS	CEILING MOUNTED OCCUPANCY SENSOR
$	WALL MOUNTED SWITCH
$OS	WALL MOUNTED OCCUPANCY SENSOR SWITCH
$D	WALL MOUNTED DIMMER SWITCH
	SPEAKER
WAP	WIRELESS ACCESS POINT
CL	CURRENT LIMITER
M	EXHAUST FAN
ST	TRAFFIC COUNTER/SHOPPER TRACK

Property of NY Engineers

L'OCCITANE
EN PROVENCE

TITLE:
ELECTRICAL LIGHTING PLAN

SHEET NUMBER:
E-200

ELECTRICAL PANEL SCHEDULE AND LOAD SUMMARY

ELECTRICAL PANEL SCHEDULE

PANELBOARD		H7	VOLTAGE	277 / 480 V	PHASE	3	WIRE	4									
PANEL TYPE		MCB	MAINS	100A	BUS RATING	125A	AIC RATING	V.I.F.	1	2							
NEMA TYPE ENCLOSURE		1	MOUNTING	SURFACE	OPTIONS	-	NOTE	EXISTING PANEL									
CKT. NO.	EQT TAG	CKT TAG	DESCRIPTION	POLE	WIRE SIZE	BKR. SIZE	TOTAL WATTS	PHASE	TOTAL WATTS	BKR. SIZE	WIRE SIZE	POLE	DESCRIPTION	CKT TAG	EQT TAG	CKT. NO.	
1			HOT WATER HEATER	3	12	20	1,500	A	4,480							2	
3		(N)					1,500	B	6,065	50	6	3	30KVA TRANSFORMER	(N)		4	
5							1,500	C	5,655							6	
7			SPARE	1		20		A		20		1	SPARE			8	
9			SPARE	1		20		B		20		1	SPARE			10	
11			SPARE	1		20		C		20		1	SPARE			12	
13			SPACE					A					SPACE			14	
15			SPACE					B					SPACE			16	
17			SPACE					C					SPACE			18	
19			SPACE					A					SPACE			20	
21			SPACE					B					SPACE			22	
23			SPACE					C					SPACE			24	
25			SPACE					A					SPACE			26	
27			SPACE					B					SPACE			28	
29			SPACE					C					SPACE			30	

ALL PHASES TO BE BALANCED TO WITHIN 7%

A= 5,980 WATTS

B= 7,565 WATTS

C= 7,155 WATTS

TOTAL CONNECTED LOAD	20,700	WATTS	25	AMPS
TOTAL DEMAND LOAD	21,438	WATTS	26	AMPS

(E) EXISTING TO REMAIN
(N) NEW CIRCUIT
GFCI GROUND FAULT CURRENT INTERRUPTER
IG CIRCUITS WITH ISOLATED GROUND
TC CIRCUITS ON TIMECLOCK
EMS ROUTING TO THE EMS PANEL
C BREAKER LOCK
a,b,c SWITCHES CONTROLLING LIGHTS

ELECTRICAL PANEL SCHEDULE

PANELBOARD		L7	VOLTAGE	120 / 208 V	PHASE	3	WIRE	4									
PANEL TYPE		MCB	MAINS	100A	BUS RATING	125A	AIC RATING	V.I.F.	1	2							
NEMA TYPE ENCLOSURE		1	MOUNTING	SURFACE	OPTIONS		NOTE	EXISTING PANEL									
CKT. NO.	EQT TAG	CKT TAG	DESCRIPTION	POLE	WIRE SIZE	BKR. SIZE	TOTAL WATTS	PHASE	TOTAL WATTS	BKR. SIZE	WIRE SIZE	POLE	DESCRIPTION	CKT TAG	EQT TAG	CKT. NO.	
1	TC/C2/c	(N)	LIGHTING- LIBRARY	1	12	20	200	A	1,800	20	12	1	SHOW WINDOW RECEPTACLE	(N)	TC/C1	2	
3	TC/C2/b	(N)	LIGHTING- LIBRARY	1	12	20	200	B	150	20	12	1	LIGHTS EM/NL	(N)		4	
5	TC/C2/a	(N)	LIGHTING- RESTNQUE	1	12	20	200	C	500	20	12	1	IT CABINET	(N)		6	
7	TC/C1	(N)	LIGHTING- SHOW WINDOW	1	12	20	200	A	1,000	20	12	1	MICROWAVE	(N)		8	
9		(N)	LIGHTING- BOH AND RESTROOM	1	12	20	200	B	500	20	12	1	REFRIGERATOR	(N)		10	
11		(N)	LIGHTBOX	1	12	20	200	C	540	20	12	1	RECEPTACLE- RESTANQUE	(N)		12	
13		(N)	LIGHTBOX	1	12	20	200	A	360	20	12	1	RECEPTACLE- MANAGER DESK	(N)		14	
15		(N)	TRAFFIC COUNTER	1	12	20	300	B	900	20	12	1	RECEPTACLE-LIBRARY	(N)		16	
17		(N)	RESTROOM AND HAND SINK GFI REC.	1	12	20	360	C	200	20	12	1	TIME CLOCK	(N)		18	
19		(N)	RECEPTACLE - POS	1	12	20	360	A	360	20	12	1	GEN. RECEPTACLE SALES AREA & BOH	(N)		20	
21		(N)	ROOF TOP GFI RECEPTACLE	1	12	20	180	B	180	20	12	1	GFI REC. BOH	(N)		22	
23		(N)	RCP-1	1	12	20	200	C		20		1	SPARE			24	
25			SPARE	1		20		A		20		1	SPARE			26	
27			SPARE	1		20		B		20		1	SPARE			28	
29			SPARE	1		20		C		20		1	SPARE			30	
31			SPARE	1		20		A		20		1	SPARE			32	
33			SPARE	1		20		B		20		1	SPARE			34	
35			SPARE	1		20		C		20		1	SPARE			36	
37			SPARE	1		20		A		20		1	SPARE			38	
39							435	B	3,020							40	
41		(N)	(E) FCU-1	2	12	20	435	C	3,020	40	8	2	(E) ACCU-1	(N)		42	

ALL PHASES TO BE BALANCED TO WITHIN 7%

A= 4,480 WATTS

B= 6,065 WATTS

C= 5,655 WATTS

TOTAL CONNECTED LOAD	16,200	WATTS	45	AMPS
TOTAL DEMAND LOAD	16,938	WATTS	48	AMPS

(E) EXISTING TO REMAIN
(N) NEW CIRCUIT
GFCI GROUND FAULT CURRENT INTERRUPTER
IG CIRCUITS WITH ISOLATED GROUND
TC CIRCUITS ON TIMECLOCK
EMS ROUTING TO THE EMS PANEL
C BREAKER LOCK
a,b,c SWITCHES CONTROLLING LIGHTS

ELECTRICAL LOAD SUMMARY

DESCRIPTION	NEC CONNECTED kW	VOLT	PHASE	NEC DEMAND FACTOR	NEC DEMAND kW
LIGHTING- 120V	1.2	120	1	1.25	1.4
RECEPTACLES	6.3	120	1	>10kW=10+[0.5*(kW-10)]	6.3
S/W OUTLETS	1.8	120	1	1.25	2.3
ACCU	6.0	208	1	1.00	6.0
AHU	0.9	208	1	1.00	0.9
HOT WATER HEATER	4.5	480	3	1.00	4.5
TOTALS	20.7				21.4

NOTES:

* USE GREATER VALUE OF THE TWO CATEGORIES.

** 125% OF THE LARGEST MOTOR OR COMPRESSOR IN SYSTEM APPLIED ONLY ON ONE UNIT.

*** N.E.C. ARTICLE 220-12 REQUIREMENT (200 VA PER FOOT OF SHOW WINDOW) MINUS ACTUAL SHOW WINDOW LIGHTING kVA.

N.E.C. DEMAND kVA x 1,000 / SYSTEM VOLTAGE x 1.732 — MINIMUM FEEDER AMPERAGE

21.4 x 1000 = 21,438

480 x 1.732 = 831

25.8 AMPS USE (NEW) 100AMP FEEDER FROM MAIN SWITCHBOARD 'MSB-C1'.

PANEL SCHEDULE GENERAL NOTES

1. ALL CIRCUITING SHOWN IS FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY CIRCUITING OF THE EXISTING DEVICES ON FIELD AND INFORM ENGINEER FOR DISCREPANCIES.
2. ELECTRICAL CONTRACTOR TO VERIFY THE EXACT PANEL SIZES AND INCOMING FEEDER SIZE.
3. ALL EXISTING TO REMAIN ELECTRICAL DEVICES/EQUIPMENTS SHALL BE CONNECTED TO RESPECTIVE NEW/EXISTING PANELS. E.C. TO VERIFY EXACT DETAILS & CIRCUIT NUMBER ON FIELD.
4. ELECTRICAL CONTRACTOR TO COORDINATE WITH THE MANUFACTURER OF EQUIPMENT FOR THE WIRE SIZE & RATING OF MOCP BEFORE THE COMMENCEMENT OF WORK.
5. ELECTRICAL CONTRACTOR TO COORDINATE EXACT LOCATION AND ELECTRICAL REQUIREMENT OF PLUMBING/MECHANICAL EQUIPMENTS WITH RESPECTIVE SYSTEM CONTRACTOR/OWNER/ARCHITECT.
6. ELECTRICAL CONTRACTOR SHALL VERIFY THE EXACT CIRCUIT, CIRCUIT NUMBER IN FIELD & ADJUST / MODIFY CIRCUITING AS REQUIRED.
7. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL CIRCUIT BREAKERS, JUNCTION BOXES, CONDUIT AND CONDUCTORS TO CREATE WORKING CIRCUITS. FIELD VERIFY. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY THE FIXTURE WATTAGE AND CONDUCT A FIELD TEST TO AVOID CIRCUIT OVERLOADS. ELECTRICAL CONTRACTOR SHALL NOT EXCEED 1920 WATTS FOR ANY SINGLE 20A/1P BRANCH CIRCUIT. ELECTRICAL CONTRACTOR SHALL NOT EXCEED 1440 WATTS FOR ANY SINGLE 15A/1P BRANCH CIRCUIT.

EXISTING PANELBOARD KEYED NOTES

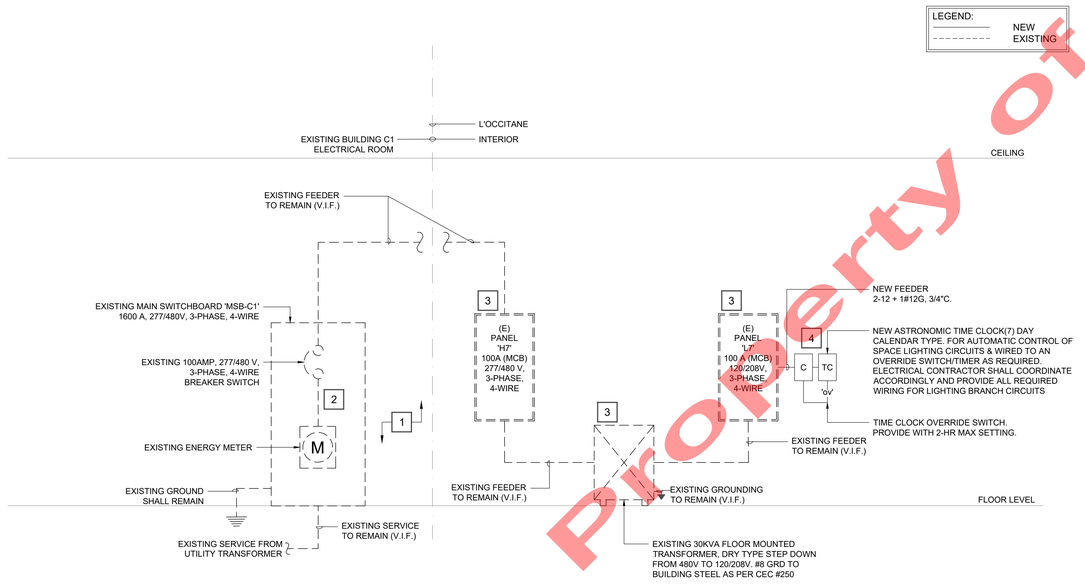
1. NEW BREAKERS MAY BE REQUIRED FOR USE IN THE EXISTING PANELBOARD TO MATCH RATING INDICATED IN THE PANEL SCHEDULE. PRIOR TO BID/PRICING, THE ELECTRICAL CONTRACTOR SHALL VERIFY ALL EXISTING-TO-REMAIN PANELBOARD MANUFACTURER AND MODEL NUMBER TO ENSURE THAT REPLACEMENT BREAKERS ARE AVAILABLE. WHERE BREAKER AVAILABILITY ISSUES ARISE, NOTIFY THE PROJECT MANAGER PRIOR TO BID/PRICING.
2. DESIGNATED CIRCUIT NUMBER SHOWN ON THE PANEL SCHEDULE FOR A CERTAIN LOAD, MAY BE DIFFERENT THAN THE ACTUAL CIRCUIT NUMBER IN THE EXISTING PANELBOARD. ALL EXISTING-TO-REMAIN ELECTRICAL LOADS SHALL REMAIN CONNECTED TO THE SAME BREAKER AND CIRCUIT DESIGNATION. AVAILABLE SPARES AND SPACES SHALL BE UTILIZED TO FEED THE NEW LOADS.

CODE NOTE PER CEC 408.4: EVERY CIRCUIT AND CIRCUIT MODIFICATION SHALL BE LEGIBLY IDENTIFIED AS ITS CLEAR, EVIDENT, AND SPECIFIC PURPOSE OR USE. THE IDENTIFICATION SHALL INCLUDE SUFFICIENT DETAIL TO ALLOW EACH CIRCUIT TO BE DISTINGUISHED FROM ALL OTHERS. CIRCUIT DIRECTORY SHALL BE LOCATED ON THE FACE OR INSIDE THE PANEL DOOR IN THE CASE OF THE PANELBOARD.

CONTRACTOR TO VERIFY ANY EXISTING CIRCUITS TO REMAIN, MAINTAIN AS REQUIRED. CONTRACTOR TO MAKE UNUSED BRANCH CIRCUIT BREAKER SPARE AND AVAILABLE FOR NEW CIRCUIT.

ALL ELECTRICAL WORK SHALL BE DESIGNED PER CALIFORNIA ELECTRICAL CODE 2022 (CEC, 2022).

ELECTRICAL RISER DIAGRAM



VERIFY THE FOLLOWING PRIOR TO BID/ PRICING:

- EXISTING CONDUIT AND FEEDERS SIZE BETWEEN TENANT SPACE AND LANDLORD SWITCHBOARD.
- EXISTING MAIN SERVICE DISCONNECT RATING.
- EXISTING METER.

IF THE EXISTING SERVICE DISCONNECT AND FEEDERS ARE RATED FOR LESS THAN THE RATING SHOWN ON THIS RISER. NOTIFY THE PROJECT MANAGER AND ENGINEER IMMEDIATELY PRIOR TO SUBMITTING BID/ PRICING PACKAGE SO DRAWINGS CAN BE REVISED AND UPDATED ACCORDINGLY

CONTRACTOR TO VERIFY EXISTING CONDUIT DURING BIDDING STAGE AND REPORT TO TENANT ARCHITECT ANY DISCREPANCIES THAT IS DIFFERENT THAN SHOWN ON PLANS.

RISER DIAGRAM GENERAL NOTES

A. HVAC CIRCUIT BREAKERS TO BE "HACR" TYPE WHERE REQUIRED BY EQUIPMENT NAMEPLATE PER N.E.C.

B. BALANCE ALL PANELS AND ELECTRICAL EQUIPMENT, UNDER LOAD CONDITIONS, TO ±7% BETWEEN PHASES: A/B, B/C, C/A REGARDLESS OF CIRCUITING INDICATED. PROVIDE BALANCE SHEET TO CONSTRUCTION MANAGER AT PUNCHLIST.

C. PROPER CLEARANCE MUST BE MAINTAINED ABOUT ELECTRICAL EQUIPMENT PER N.E.C. FIELD VERIFY EXACT MOUNTING SPACE AVAILABLE IN ELECTRICAL ROOM/AREA PRIOR TO INSTALLATION OF ELECTRICAL EQUIPMENT.

D. MAKE ALL FINAL ELECTRICAL CONNECTIONS FOR A COMPLETE ELECTRICAL DISTRIBUTION SYSTEM. ALL CONNECTIONS/DISCONNECTIONS TO LANDLORDS/UTILITIES SERVICE EQUIPMENT SHALL BE AS DIRECTED BY LANDLORDS/UTILITIES SITE REPRESENTATIVE. TENANT GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TERMINATION/DETERMINATION EXPENSES.

F. SYSTEM SHALL BE GROUNDED TO THE MAIN BUILDING'S GROUNDING SYSTEM.

G. DISCONNECT SWITCHES AND PANELS SHALL BE INSTALLED ON PLYWOOD BACKERBOARDS.

H. TENANT CONTRACTOR MUST VERIFY ELECTRICAL SERVICE, SUB-FEED WIRING AND PANELS PRIOR TO START OF TENANT'S ELECTRICAL WORK. TENANT GENERAL CONTRACTOR SHALL MAKE APPLICATION TO THE LOCAL UTILITY FOR CONTINUED METERED ELECTRIC SERVICE IN THE TENANT'S NAME. TENANT GENERAL CONTRACTOR SHALL CONFIRM ALL LOCAL UTILITY GUIDELINES AND REQUIREMENTS PRIOR TO BID, SHALL INCLUDE THE COSTS OF THESE REQUIREMENTS IN THE BID, AND SHALL COMPLY WITH THEM DURING CONSTRUCTION. AVAILABLE FAULT CURRENT AT SERVICE EQUIPMENT SHALL BE LEGIBLY MARKED IN THE FIELD WITH THE MAXIMUM AVAILABLE FAULT CURRENT PER CALIFORNIA ELECTRICAL CODE ARTICLE 110.24.

I. CONTRACTOR SHALL VERIFY INCOMING SERVICE AMPERAGE, WIRE SIZING AND DISTRIBUTION.

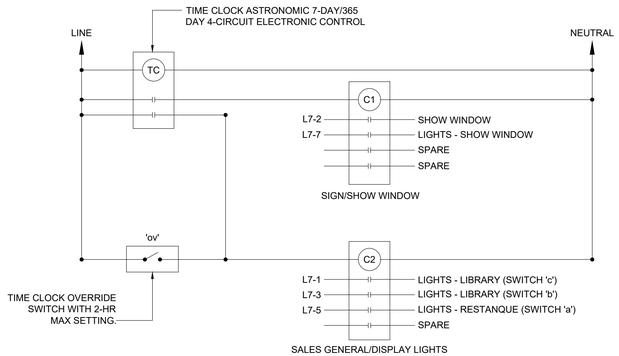
J. CONTRACTOR SHALL COORDINATE WITH BASE BUILDING FOR THE EXACT LOCATION OF THE EXISTING SWITCH GEAR AND EXACT POWER DISTRIBUTION .

K. CONTRACTOR SHALL VERIFY OPERABLE CONDITION INFIELD OF ALL EXISTING TO REMAIN ELECTRICAL DEVICES/EQUIPMENTS AND REPLACE WITH NEW IF FOUND INOPERABLE.

RISER DIAGRAM KEYED NOTES

1. LANDLORD'S CONTRACTOR SHALL COORDINATE WITH BASE BUILDING /LANDLORD /OWNER FOR EXACT POWER DISTRIBUTION, LOCATION PRIOR TO COMMENCING ANY WORK. INFORM ENGINEER ON RECORD FOR ANY DISCREPANCIES. BASE BID ACCORDINGLY.
2. EXISTING 100A, 277/480V, 3-PHASE, 4-WIRE ELECTRICAL METER AND BREAKER SWITCH SHALL REMAIN FOR THE SPACE. LANDLORD'S CONTRACTOR SHALL VERIFY THE ELECTRICAL RATING, SIZE, LOCATION, AND OPERABLE CONDITION OF THE EXISTING ELECTRICAL METER AND BREAKER SWITCH IN THE FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY. INFORM THE ENGINEER FOR ANY DISCREPANCY FOUND BEFORE COMMENCING ANY WORK.
3. EXISTING ELECTRICAL PANELS 'H7' AND 'L7' WITH 30 KVA FLOOR MOUNTED TRANSFORMER SHALL REMAIN. LANDLORD'S CONTRACTOR SHALL VERIFY THE EXACT LOCATION, RATING, AND OPERABLE CONDITION IN THE FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.MAINTAIN CLEARANCE FOR THE ELECTRICAL PANEL PER CEC 110.26 (A) (1).
4. NEW TIME CLOCK WITH LIGHTING CONTACTOR. ELECTRICAL CONTRACTOR SHALL COORDINATE THE EXACT LOCATION AND REQUIREMENT WITH ARCHITECT/OWNER PRIOR TO ROUGH IN. BASE BID ACCORDINGLY

TIME CLOCK AND LIGHTING CONTACTOR DETAILS



TIME CLOCK SCHEDULE:

CONTRACTOR TO SET TIME CLOCK SETTINGS AND VERIFY WITH OWNER:

1. DURING SET "OFF" TIME LIGHTING TO BE CONTROLLED BY A 2-HR MANUAL OVERRIDE SWITCH.

L'OCCITANE
EN PROVENCE

TITLE:
ELECTRICAL PANELBOARD AND RISER DIAGRAM

SHEET NUMBER:
E-300

Property of NY Engineers

GENERAL PROVISIONS :

A. GENERAL

1. REQUIREMENTS SPECIFIED IN DIVISION 1, INSTRUCTIONS TO BIDDERS, SUPPLEMENTAL GENERAL CONDITIONS, SPECIAL CONDITIONS, ADDENDA, ALTERNATES, CONTRACT AND PROPOSAL, ALONG WITH DIVISION 26, 27, 28 AND ALL ITS SECTIONS, COMPRISE THE CONTRACT DOCUMENTS FOR THE ELECTRICAL CONTRACT, ALONG WITH THESE SPECIFICATIONS AS THOUGH THEY WERE ONE. ANYTHING IMPLIED BY THE SPECIFICATIONS SHALL BE INTERPRETED AS ALSO IMPLIED BY THE DRAWINGS AND VICE VERSA. PROVIDE NECESSARY ITEMS FOR A COMPLETE INSTALLATION OF ALL ELECTRICALLY OPERATED EQUIPMENT LISTED IN THE SPECIFICATIONS OR SHOWN ON THE CONTRACT DRAWINGS.

2. THE ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, EQUIPMENT DRAWINGS AND SPECIFICATIONS ARE INCORPORATED INTO, AND BECOME A PART OF THIS DIVISION. THIS CONTRACTOR SHALL EXAMINE ALL SUCH DRAWINGS AND SPECIFICATIONS AND BECOME THOROUGHLY FAMILIAR WITH THE PROVISIONS CONTAINED THEREIN. THE SUBMISSION OF HIS BID SHALL INDICATE SUCH KNOWLEDGE.

3. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC.THEY ARE INTENDED TO SHOW THE APPROXIMATE LOCATIONS OF EQUIPMENT AND CONDUIT.DIMENSIONS GIVEN ON THE PLANS, IN FIGURES, SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS AND SHALL BE VERIFIED IN THE FIELD.THE ELECTRICAL CONTRACTOR SHALL LAYOUT ALL EQUIPMENT ROOMS TO MAKE SURE THE EQUIPMENT, AS PURCHASED, FITS IN THE ROOM OR PACE SHOWN. EXACT LOCATION OF ALL EQUIPMENT SHALL BE VERIFIED IN THE FIELD AND ROUTING OF CONDUITS SHALL SUIT FIELD CONDITIONS.

4. UNTIL THE TIME OF INSTALLATION, THE ARCHITECT RESERVES THE RIGHT TO MAKE MINOR CHANGES IN THE LOCATION OF CONDUIT AND EQUIPMENT WITHOUT ADDITIONAL COST TO THE CONTRACT.

5. THE ELECTRICAL DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER. MATERIAL AND LABOR NECESSARY TO THE PROJECT SHALL BE FURNISHED AND INSTALLED EVEN THOUGH NOT SPECIFICALLY MENTIONED IN BOTH. LABOR AND/OR MATERIALS NEITHER SHOWN NOR SPECIFIED, BUT OBVIOUSLY NECESSARY FOR THE COMPLETION AND PROPER FUNCTIONING OF THE SYSTEM, SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

6. ARRANGE ALL EQUIPMENT SUBSTANTIALLY AS SHOWN ON THE DRAWINGS. MAKE DEVIATIONS ONLY WHERE NECESSARY TO AVOID INTERFERENCE. CHECK ALL EQUIPMENT SIZES AGAINST AVAILABLE SPACE PRIOR TO SHIPMENT TO AVOID INTERFERENCE.

7. EXAMINE THE WORK OF OTHER TRADES INSOFAR AS THEIR WORK COMES IN CONTACT WITH OR IS COVERED BY THIS WORK IN NO CASE ATTACH TO, OR FINISH AGAINST ANY DEFECTIVE WORK OR INSTALL WORK IN A MANNER WHICH WILL PREVENT PROPER INSTALLATION OF THE WORK OF OTHER TRADES.

8. ELECTRICAL CONTRACTOR SHALL VERIFY WITH OTHER TRADES ALL ELECTRICAL CHARACTERISTICS OF EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS, CONTRACTOR SHALL VERIFY VOLTAGE, PHASE, AND HORSEPOWER AND SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO START OF WORK. ELECTRICAL CONTRACTOR SHALL PROVIDE DISCONNECTING MEANS AND OVERLOAD PROTECTION FOR ALL EQUIPMENT, UNLESS FURNISHED INTEGRAL WITH EQUIPMENT PACKAGE.

9. IT IS THE INTENT OF THESE DRAWINGS THAT THIS BE A COMPLETE ELECTRICAL JOB, ANY ERRORS OR OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO BIDDING THE JOB.

10. IN THE CASE OF CONFLICT BETWEEN DRAWINGS, NOTES, AND SPECIFICATIONS, OR AMONG DRAWINGS, THE STRICTEST PROVISION OR LARGER QUANTITY SHALL GOVERN.

11. THE EXISTING CONDITIONS OF THESE DOCUMENTS ARE BASED UPON EXISTING DRAWINGS PREPARED BY ____________ DATED _____AND MAY NOT REFLECT CURRENT INSTALLATIONS OR AS-BUILT CONDITIONS. PRIOR TO INITIATING MATERIAL PROCUREMENT AND CONSTRUCTION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY EXISTING CONDITIONS ARE CONSISTENT WITH THE CONTRACT DOCUMENTS. THIS MAY REQUIRE REMOVAL OF EXISTING FINISHES AND POSSIBLE SELECTIVE DEMOLITION TO VERIFY AS-BUILT CONDITIONS.

12. DO NOT SCALE DRAWINGS.

13. THE CONTRACTOR SHALL MAKE PROVISIONS FOR THE DELIVERY AND SAFE STORAGE OF HIS/HER MATERIALS AND EQUIPMENT IN COORDINATION WITH WORK OF OTHER TRADES. MATERIALS AND EQUIPMENT SHALL BE DELIVERED AT SUCH STAGES OF THE WORK AS WILL EXPEDITE THE WORK AS A WHOLE AND SHALL BE MARKED AND STORED IN SUCH A WAY AS TO BE EASILY CHECKED AND INSPECTED. THE ARRIVAL AND INSPECTION OF LARGE EQUIPMENT ITEMS SHALL BE SCHEDULED EARLY ENOUGH TO PERMIT ENTRY AND SETTING WHEN THERE IS NO RESTRICTION OR PROBLEM DUE TO SIZE AND WEIGHT. PROTECTION OF ALL FINISHES DURING DELIVERY IS THE RESPONSIBILITY OF THE CONTRACTOR.

B. VISIT TO THE SITE

1. THIS CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING HIS WORK. THE SUBMISSION OF HIS PROPOSAL SHALL INDICATE SUCH KNOWLEDGE. NO ADDITIONAL PAYMENT SHALL BE MADE ON CLAIMS THAT ARISE FROM A LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS

C. CODE AND PERMITS

1. INSTALLATION SHALL BE IN FULL ACCORDANCE WITH ALL CODES, RULES, AND REGULATIONS OF MUNICIPAL, CITY, COUNTY, STATE, PUBLIC UTILITIES, AND ALL OTHER AUTHORITIES HAVING JURISDICTION OVER THE PREMISES.

2. COMPLY WITH ANY SPECIFICATION REQUIREMENTS THAT ARE IN EXCESS BUT NOT IN CONFLICT WITH CODE REQUIREMENTS.

3. THE CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS, PLAN REVIEWS, AND CERTIFICATES OF INSPECTION IN CONNECTION WITH HIS WORK, REQUIRED BY THE FOREGOING AUTHORITIES. BEFORE FINAL PAYMENT OF THE CONTRACT IS ALLOWED, ALL CERTIFICATES SHALL BE DELIVERED TO THE ARCHITECT IN DUPLICATE.

4. ELECTRICAL MATERIAL AND EQUIPMENT SHALL BEAR THE UL LABEL EXCEPT WHERE UL DOES NOT LABEL SUCH TYPES OF MATERIAL AND EQUIPMENT.

D. SHOP DRAWINGS SUBMITTALS

1. THE ELECTRICAL CONTRACTOR SHALL SUBMIT PRODUCT DATA AND SHOP DRAWING. EACH SUBMITTAL SHALL BE IDENTIFIED USING THE RESPECTIVE SPECIFICATION NUMBERING SYSTEM AND TITLES. EACH SUBMITTAL SHALL CLEARLY IDENTIFY WHICH PRODUCTS AND OPTIONS ARE APPLICABLE. THE SUBMITTALS SHALL BE SUBMITTED THROUGH THE ARCHITECT TO THE ENGINEER AND THEN, IF NECESSARY, RESUBMITTED FOR FINAL APPROVAL. SUBMITTALS SHALL BE SUBMITTED FOR THE FOLLOWING ITEMS:

   a. WIRING DEVICES
   b. SWITCHBOARDS, PANELBOARDS, TRANSFORMERS, AND SAFETY SWITCHES INCLUDING FAULT CURRENT STUDY BASED ON EQUIPMENT BEING SUPPLIED.
   c. LIGHTING CONTROL SYSTEM AND DEVICES.
   d. LIGHTING FIXTURES

2. ELECTRONIC SUBMITTALS: PREPARE SUBMITTALS AS PDF PACKAGE, INCORPORATING COMPLETE INFORMATION INTO EACH PDF FILE. NAME PDF FILE WITH SUBMITTAL NUMBER.

3. EACH SUBMITTAL SHALL BE PROVIDED WITH A COVER IDENTIFYING THE FOLLOWING;
   a. NAME OF JOB.
   b. LOCATION OF THE JOB, ADDRESS, CITY, AND STATE.
   c. NAME AND ADDRESS OF THE COMPANY ISSUING THE SUBMITTAL.
   d. DATE OF THE SUBMITTAL.

4. ALL SUBMITTED PRODUCT DATA AND SHOP DRAWINGS (MANUFACTURERS' EQUIPMENT DESCRIPTIVE SHEETS OR VENDORS' PREPARED DRAWINGS) SHALL HAVE THE GENERAL CONTRACTOR'S OR SUBCONTRACTOR'S “STAMP OF APPROVAL” INDICATING THAT THE ITEM SUBMITTED IS AS CALLED FOR ON THE PLANS AND SPECIFICATIONS, IS APPROVED BY THE GENERAL CONTRACTOR OR SUBCONTRACTOR, THE DATE OF APPROVAL AND INITIALED BY THE PERSON APPROVING THE SUBMITTAL AND THE NAME OF THE COMPANY SUBMITTING SAID EQUIPMENT FOR APPROVAL.

5. ANY SUBMITTAL NOT AS SPECIFIED SHALL BE RETURNED WITHOUT REVIEW FOR CORRECTIONS AND RE-SUBMITTAL.

6. EVERY EFFORT SHALL BE MADE, IN CHECKING THE SHOP DRAWINGS, TO DETECT AND CORRECT ALL ERRORS, OMISSIONS, AND INACCURACIES. FAILURE TO DO THIS WILL NOT RELIEVE THE ELECTRICAL CONTRACTOR OF THE RESPONSIBILITY FOR THE PROPER AND COMPLETE INSTALLATION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

E. AS-BUILT DRAWINGS

1. SUBMIT THREE PAPER-COPY SET(S) OF MARKED-UP RECORD PRINTS TO THE ARCHITECT. CONTRACTOR SHALL USE RED INK FOR ALL CONTRACTOR MARK-UPS ON RECORD PRINTS.

2. SUBMIT PDF ELECTRONIC FILES OF SCANNED RECORD PRINTS. SCANNED RECORD PRINTS SHALL BE IN COLOR.

3. PRINT AND SCAN EACH DRAWING, WHETHER OR NOT CHANGES AND ADDITIONAL INFORMATION WERE RECORDED.

F. STANDARDS AND SUBSTITUTIONS

1. WHEREVER THE WORDS "APPROVED BY", "APPROVED EQUAL", "AS DIRECTED" OR SIMILAR PHRASES ARE USED IN THE FOLLOWING SPECIFICATIONS, THEY SHALL BE UNDERSTOOD TO REFER TO THE OWNER AS THE APPROVING AGENCY. THE NAME OR MAKE OF ANY EQUIPMENT OR MATERIALS NAMED IN THIS SPECIFICATIONS (WHETHER OR NOT THE WORDS "OR APPROVED EQUAL" ARE USED) SHALL BE KNOWN AS THE "STANDARD".

2. THESE SPECIFICATIONS ESTABLISH QUALITY STANDARD OF MATERIALS AND EQUIPMENT TO BE PROVIDED. SPECIFIC ITEMS ARE IDENTIFIED BY MANUFACTURER, TRADE NAME, OR CATALOG DESIGNATION. THIS CONTRACTOR SHALL SUBMIT HIS BASE BID PRICE BASED UPON STANDARD SPECIFIED EQUIPMENT DESCRIBED HEREIN AND AS DETAILED ON DRAWINGS AND ASSOCIATED CONTRACT DOCUMENTS. THESE SPECIFICATIONS ARE NOT TO BE CONSIDERED PROPRIETARY. THE CONTRACTOR MAY SUBMIT INFORMATION ON MATERIALS AND MANUFACTURERS (OTHER THAN THOSE LISTED) FOR REVIEW BY THE ARCHITECT AND ENGINEER NO LATER THAN TEN (10) DAYS BEFORE BIDS ARE SUBMITTED. MANUFACTURERS OF PRODUCTS ACCEPTED BY THE ARCHITECT AND ENGINEER WILL BE LISTED IN AN ADDENDUM TO THE SPECIFICATIONS AS AN ACCEPTABLE SUBSTITUTION EQUIPMENT ACCEPTED AS DETAILED BELOW AND SHALL BE SHOWN AS A SEPARATE ADD OR DEDUCT PRICE TO BE FACTORED INTO THE BASE BID PRICE BY THE ARCHITECT AND OWNER IF ACCEPTED.

3. SHOULD THE CONTRACTOR PROPOSE TO FURNISH MATERIALS AND EQUIPMENT OTHER THAN THOSE SPECIFIED OR APPROVED BY ADDENDUM, SUBMIT A WRITTEN REQUEST FOR SUBSTITUTIONS TO THE ARCHITECT AT THE BID OPENING. THE REQUEST SHALL BE AN ALTERNATE TO THE ORIGINAL BID; BE ACCOMPANIED WITH COMPLETE DESCRIPTIVE (MANUFACTURER, BRAND NAME, CATALOG NUMBER, ETC.) AND TECHNICAL DATA FOR ALL ITEMS. FAILURE BY THIS CONTRACTOR TO SUBMIT THE REQUISITE DOCUMENTATION DETAILED ABOVE SHALL BE UNDERSTOOD BY THE ARCHITECT AND ENGINEER TO INDICATE THAT SUBSTITUTE EQUIPMENT WILL NOT BE PRESENTED BY THE CONTRACTOR FOR CONSIDERATION. SUCH SUBSTITUTIONS WILL NOT BE CONSIDERED AFTER THE BID OPENING DATE AND DELAY OF PROJECT WILL NOT BE PERMITTED FOR FURTHER INSPECTION AND EVALUATION AFTER THIS DATE. WHERE SUCH SUBSTITUTIONS ALTER THE DESIGN OR SPACE REQUIREMENTS INDICATED ON THE DRAWINGS, INCLUDE ALL ITEMS OF COST FOR THE REVISED DESIGN AND CONSTRUCTION INCLUDING COST OF ALL ALLIED TRADES INVOLVED.

4. ACCEPTANCE OR REJECTION OF THE PROPOSED SUBSTITUTIONS SHALL BE SUBJECT TO APPROVAL OF THE ARCHITECT AND ENGINEER. IF REQUESTED, THE CONTRACTOR SHALL SUBMIT (AT HIS COST) INSPECTION SAMPLES OF BOTH THE SPECIFIED AND PROPOSED SUBSTITUTE ITEMS.

5. IN ALL CASES WHERE SUBSTITUTIONS ARE PERMITTED, THE CONTRACTOR SHALL BEAR ANY EXTRA COST OF EVALUATING THE QUALITY OF THE MATERIAL AND EQUIPMENT TO BE PROVIDED.

G. TESTING AND PLACING IN SERVICE

1. ANY MATERIAL OR EQUIPMENT FAILING A TEST SHALL BE REPAIRED OR REPLACE AT THE CONTRACTOR'S EXPENSE.

2. TESTS SHALL INCLUDE THE FOLLOWING:

   a. MEASURE THE LOAD ON EACH PHASE OF THE MAIN SERVICE AND EACH PHASE OF EVERY FEEDER UNDER FULL LOAD CONDITIONS.
   b. MEASURE THE NO-LOAD AND FULL-LOAD VOLTAGES (PHASE TO PHASE, PHASE TO NEUTRAL AND PHASE TO GROUND FOR EACH PHASE OF EACH SERVICE, OF EACH SEPARATELY DERIVED SYSTEM, AND AT EACH PANELBOARD OR TRANSFORMER).
   c. MEASURE THE GROUND RESISTANCE OF THE MAIN SERVICE GROUNDING ELECTRODE AND THE GROUND RESISTANCE OF EACH SEPARATELY DERIVED SYSTEM'S GROUNDING ELECTRODE.
   d. MAKE INSULATION RESISTANCE TESTS ON ALL DRY TYPE TRANSFORMERS AND MOTORS.

3. PROVIDE PERFORMANCE TESTING AS REQUIRED PER C.E.C. OR LOCAL AUTHORITY HAVING JURISDICTION.

H. INTERFERENCES

1. BEFORE THE INSTALLATION OF ANY ITEM BEGINS, THE ELECTRICAL CONTRACTOR SHALL CAREFULLY ASCERTAIN THAT IT DOES NOT INTERFERE WITH CLEARANCES FOR THE ERECTION OF FINISH BEAMS, COLUMNS, PILASTERS, WALLS, OR OTHER STRUCTURAL OR ARCHITECTURAL MEMBERS AS SHOWN ON THE ARCHITECTURAL DRAWINGS. IF ANY WORK IS INSTALLED AND THE ARCHITECTURAL DESIGN CANNOT BE FOLLOWED, THIS CONTRACTOR SHALL, AT HIS OWN EXPENSE, MAKE CHANGES IN HIS WORK AS DIRECTED BY THE ARCHITECT TO PERMIT THE COMPLETION OF THE ARCHITECTURAL WORK IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS.

2. IT SHALL BE THE DUTY OF THIS CONTRACTOR TO REPORT ANY INTERFERENCES BETWEEN HIS WORK AND THAT OF ANY OF THE OTHER CONTRACTORS AS SOON AS THEY ARE DISCOVERED. THE ARCHITECT SHALL DETERMINE WHICH EQUIPMENT WILL BE RELOCATED, REGARDLESS OF WHICH WAS INSTALLED FIRST. HIS DECISION WILL BE FINAL.

I. QUALITY ASSURANCE

1. ALL PRODUCTS SHALL BE NEW AND OF THE TYPE AND QUALITY SPECIFIED. WHERE MATERIALS, EQUIPMENT, APPARATUS, OR OTHER PRODUCTS ARE SPECIFIED BY MANUFACTURER, BRAND NAME, TYPE OF CATALOG NUMBER, SUCH DESIGNATION SHALL ESTABLISH THE STANDARDS OF THE DESIRED QUALITY AND STYLE. IT IS THE INTENT OF THESE SPECIFICATIONS TO ESTABLISH A STANDARD OF QUALITY OF MATERIALS AND EQUIPMENT INSTALLED.

J. SPECIAL INSPECTIONS

1. SPECIAL INSPECTION (AS APPLICABLE) IS TO BE PROVIDED IN ADDITION TO INSPECTIONS CONDUCTED BY THE DEPARTMENT OF BUILDING SAFETY AND SHALL NOT BE CONSTRUED TO RELIEVE THE OWNER OF HIS/HER AUTHORIZED AGENT FROM REQUESTING PERIODIC AND CALLED INSPECTIONS REQUIRED BY THE BUILDING CODE. SPECIAL INSPECTION SHALL BE PAID BY THE OWNER.

2. SPECIAL INSPECTION SHALL MEET THE QUALIFICATIONS AS STATED IN THE APPLICABLE BUILDING CODE AND SHALL PERFORM THE DUTIES AND RESPONSIBILITIES AS OUTLINED IN THE APPLICABLE BUILDING CODE.

3. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ACCESS TO AREAS REQUIRING TESTING OR INSPECTIONS, AND PROVIDE REQUESTED DOCUMENTATION (IF REQUIRED BY THE SPECIAL INSPECTOR).

BASIC ELECTRICAL MATERIALS AND METHODS :

A. SCOPE OF WORK

1. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIAL, STORAGE, UNPACKING, AND PLACEMENT; TO INCLUDE BUT NOT BE LIMITED TO, THE FOLLOWING ITEMS:

   a. DEMOLITION
   b. EMERGENCY LIGHTING AND POWER.
   c. COMPLETE ELECTRICAL DISTRIBUTION SYSTEM INCLUDING, BUT NOT LIMITED TO, SWITCHBOARDS, DISTRIBUTION AND APPLIANCE PANELBOARDS, TRANSFORMERS, SAFETY SWITCHES, AND FEEDERS.
   d. COMPLETE BRANCH CIRCUIT WIRING SYSTEM.
   e. COMPLETE POWER WIRING FOR ALL AIR CONDITIONING EQUIPMENT, PLUMBING EQUIPMENT, HEATING EQUIPMENT, VENTILATING, AND EXHAUST EQUIPMENT.
   f. COMPLETE LIGHTING FIXTURE INSTALLATION, INCLUDING ALL LAMPS.
   g. COMPLETE COMMUNICATIONS CONDUIT SYSTEM INCLUDING BUT NOT LIMITED TO, BACK BOXES, PLATES, J-HOOKS, CABLE TRAYS, ETC., AS SPECIFIED ON THE DRAWINGS AND AS REQUIRED BY THE LOCAL SERVICE PROVIDER AND/OR OWNER.
   h. TEMPORARY ELECTRICAL POWER AND LIGHTING AS REQUIRED FOR CONSTRUCTION.
   i. TESTING OF ALL CABLES AND CIRCUIT WIRING AFTER INSTALLATION.
   j. EXIT LIGHT SYSTEM.
   k. WIRING DEVICES, FLOOR BOXES, AND MULTI-OUTLET ASSEMBLIES.
   l. LIGHTING CONTROL SYSTEM AND DEVICES.
   m. GROUNDING AND BONDING OF THE ELECTRICAL SYSTEM.
   n. OUTDOOR LIGHTING AND CONTROLS
   o. COMMUNICATION SERVICE
   p. ELECTRIC SERVICE

B. NAMEPLATES

1. GENERAL: FURNISH AND MOUNT ON EACH PANELBOARD, SWITCHBOARD (INCLUDING BRANCH DEVICES), LARGE JUNCTION BOX, SAFETY SWITCH, STARTER, REMOTE CONTROL, PUSH BUTTON STATION, AND ALL SIMILAR CONTROLS, A NAMEPLATE DESCRIPTIVE OF THE EQUIPMENT OR EQUIPMENT CONTROLLED

2. PROVIDE BLACK AND WHITE NAMEPLATES CONSTRUCTED FROM LAMINATED PHENOLIC WITH A WHITE CENTER CORE. LETTERS SHALL BE ENGRAVED IN THE PHENOLIC TO FORM WHITE LETTERS 3/8" HIGH. FASTEN THE NAMEPLATES WITH AN ADHESIVE TYPE FASTENER.

C. MOUNTING ACCESSORIES

1. THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL ANGLE IRON, CHANNEL IRON, RODS, SUPPORTS, HANGERS, CONCRETE, OR PLYWOOD REQUIRED TO INSTALL, MOUNT, AND SUPPORT ANY ELECTRICAL EQUIPMENT OR DEVICE CALLED FOR ON THE PLANS.

2. SUPPORTING MATERIAL SHALL BE COMPLETE WITH HANGERS, CONNECTORS, BOLTS, CLAMPS, AND NECESSARY ACCESSORIES TO MAKE A COMPLETE INSTALLATION. SUPPORTING MATERIAL SHALL BE GALVANIZED, PAINTED OR OTHERWISE SUITABLY FINISHED. PRODUCTS BY BINKLEY, STEEL CITY, OR RACO WILL BE ACCEPTABLE.

3. ALL SURFACE-MOUNTED EQUIPMENT ON BLOCK WALLS SHALL BE MOUNTED ON 3/4" PLYWOOD BACKBOARD. ALL FLOOR-MOUNTED EQUIPMENT SHALL BE INSTALLED ON A 4" HIGH CONCRETE HOUSEKEEPING PAD.

D. EXECUTION

1. THE ELECTRICAL WORK FOR CONSTRUCTION PROPOSED SHALL CONFORM TO ALL FEDERAL (OSHA), STATE, ALL SPECIFIC SAFETY REQUIREMENTS, AND THE REQUIREMENTS OF THE CURRENT EDITION OF THE NEC.

2. REVIEW THE HVAC AND PLUMBING SPECIFICATIONS FOR ELECTRICAL REQUIREMENTS AND INCLUDE THE SAME IN THE CONTRACT COST.

3. EQUIPMENT CONNECTIONS, STARTERS, DISCONNECT SWITCHES, CONTROL TRANSFORMERS, AND PUSHBUTTON STATIONS FOR THE EQUIPMENT FURNISHED BY THE OWNER OR UNDER A SEPARATE CONTRACT SHALL BE INSTALLED AND CONNECTED UNDER THIS DIVISION, AS INDICATED ON THE CONTRACT DRAWINGS.

4. ALL CUTTING, PATCHING, EXCAVATING, BACKFILLING, AND CONCRETE WORK RELATED TO THIS CONTRACT WILL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. THIS CONTRACTOR SHALL ASSUME THE RESPONSIBILITY OF AND FOR THEIR REPAIR IN AN ACCEPTABLE MANNER, AS DETERMINED BY THE ARCHITECT. ALL HOLES SHALL BE CORE-DRILLED. PROVIDE FIRE STOPPING MATERIALS, UL LISTED FOR APPLICATION, IN ALL OPENINGS CREATED THROUGH FIRE-RATED WALLS, FLOORS, OR CEILINGS. CONTRACTOR SHALL FIELD VERIFY SLAB ON GRADE FLOOR CONSTRUCTION TYPE PRIOR TO CUTTING. UNDER NO CIRCUMSTANCES SHALL CUT A STRUCTURAL FLOOR SLAB THICKER THAN 4” WITHOUT PRIOR WRITTEN APPROVAL FROM ENGINEER OF RECORD. NOTIFY ENGINEER OF RECORD OF ANY SLAB THICKNESS GREATER THAN 4” PRIOR TO PROCEEDING WITH ANY SAW CUTTING.

5. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL REQUIRED ACCESS PANELS NECESSARY FOR HIS WORK, COORDINATE WITH ARCHITECT PRIOR TO INSTALLATION.

E. MATERIALS AND WORKMANSHIP

1. ALL WORK SHALL BE INSTALLED IN A PRACTICAL AND WORKMANLIKE MANNER, BY MECHANICS SKILLED IN THE SEVERAL TRADES NECESSARY.

2. ALL MATERIALS SHALL BE NEW AND FREE FROM DEFECTS AND SHALL BE THE BEST OF THEIR SEVERAL KINDS UNLESS SPECIFIED OR INDICATED ON THE DRAWINGS TO THE CONTRARY.

3. DURING EACH PHASE AND AT THE COMPLETION OF THE CONSTRUCTION, THIS CONTRACTOR SHALL REMOVE ALL DEBRIS AND EXCESS MATERIALS CAUSED BY HIS WORK. HE SHALL LEAVE THE AREA OF OPERATION BROOM CLEAN.

4. ALL ELECTRICAL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OR ETL LABEL.

5. THIS CONTRACTOR SHALL GUARANTEE HIS WORKMANSHIP AND MATERIAL (LAMPS EXCEPTED) FOR A PERIOD OF ONE YEAR FROM THE DATE OF BUILDING OPENING AND LEAVE HIS WORK IN PERFECT ORDER AT THE COMPLETION. SHOULD DEFECTS DEVELOP WITHIN THE GUARANTEE PERIOD, THE CONTRACTOR SHALL, UPON NOTICE OF THE SAME, REMEDY THE DEFECTS AND HAVE ALL DAMAGES TO OTHER WORK OR FURNISHINGS CAUSED BY THE REPAIRS CORRECTED AT HIS EXPENSE TO THE CONDITION BEFORE SUCH DAMAGE.

SAFETY SWITCHES :

A. SAFETY SWITCHES SHALL BE THE ENCLOSED HEAVY-DUTY TYPE (TYPE HD) WITH QUICK-MAKE, QUICK-BREAK MECHANISM, AND EXTERNAL PAD LOCKABLE OPERATING HANDLE.

B. SAFETY SWITCHES SHALL BE RATED FOR 240 OR 600 VOLTS AS APPLICABLE. THEY SHALL BE HORSEPOWER RATED WHEN USED IN MOTOR CIRCUITS.

C. SAFETY SWITCHES SHALL BE FUSIBLE OR NON-FUSIBLE 2, 3, OR 4 POLE AS INDICATED ON THE DRAWINGS.

D. SAFETY SWITCHES SHALL BE SINGLE THROW UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

E. ENCLOSURES SHALL BE NEMA 1 INDOORS AND NEMA 3R OUTDOORS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

F. MANUFACTURER SHALL BE SQUARE D, SIEMENS, G.E., OR CUTLER-HAMMER. ALL SAFETY SWITCHES SHALL BE BY ONE MANUFACTURER.

G. MOUNT THE SAFETY SWITCHES SECURELY BETWEEN 3' X 6' LEVELS ABOVE THE FLOOR UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

H. SWITCHES ON BLOCK WALLS SHALL BE MOUNTED ON A 3/4" PLYWOOD BACKBOARD, WHERE LOCATED INDOORS.

WIRING AND CABLE :

A. COLOR CODE CONDUCTORS (EXCEPT CONTROL AND INSTRUMENTATION CONDUCTORS) AS FOLLOWS:

	120/208 SYSTEM	277/480 SYSTEM
PHASE A	BLACK	BROWN
PHASE B	RED	ORANGE
PHASE C	BLUE	YELLOW
NEUTRAL	WHITE	GRAY
GROUND	GREEN	GREEN

1. #12 AND #10 CONDUCTORS SHALL HAVE CONTINUOUS INSULATION COLOR, AS LISTED ABOVE.

2. COLOR CODE CONDUCTORS LARGER THAN ABOVE, WHICH DO NOT HAVE CONTINUOUS INSULATION COLOR BY APPLICATION OF AT LEAST TWO LAPS OF COLORED TAPE ON EACH CONDUCTOR AT ALL POINTS OF ACCESS INCLUDING JUNCTION BOXES. COLOR TAPE SHALL BE THE EQUAL OF 3M PRODUCTS SCOTCH #35.

3. CONDUCTORS SHALL BE SOFT ANNEALED COPPER INSULATED FOR 600 VOLTS UNLESS SPECIFICALLY INDICATED OTHERWISE. ALUMINUM CONDUCTORS ARE NOT ALLOWED ON THIS PROJECT.

B. INSULATION TYPE SHALL BE TYPE THWN FOR WIRE SIZES #8 AWG AND LARGER AND THHN OR THWN FOR #10 AWG AND SMALLER. THHN SHALL NOT BE USED IN WET OR DAMP LOCATIONS.

C. FLEXIBLE CORD SHALL BE HEAVY DUTY TYPE SO WITH AN EQUIPMENT GROUND CONDUCTOR IN ADDITION TO THE CURRENT CARRYING CONDUCTORS.

D. PROVIDE #12 CONDUCTORS, UNLESS OTHERWISE INDICATED.

1. CONTROL CONDUCTORS SHALL BE #14 MINIMUM FOE CEC CLASS I #16 FOR CEC CLASS II.

E. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED.

F. CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID.

G. INSTALL WIRING IN CONDUIT.

H. CONNECT #10 AND SMALLER WIRES WITH CONSTANT PRESSURE EXPANDABLE SPRING TYPE CONNECTORS, "SCOTCHLOK" BY 3M OR B-CAP BY BUCHANAN.

I. CONNECT #8 AND LARGER WIRES WITH COMPRESSION CONNECTORS OR SPLICES AS MANUFACTURED BY BURNDY OR T&B.

J. INSULATE SPLICING CONNECTORS TO AT LEAST 200% OF THE WIRE INSULATION. USE PRE-STRETCHED TUBING CONNECTOR INSULATORS, 3M PST FOR #2 AND LARGER CONDUCTORS.

K. PULL CONDUCTORS USING RECOGNIZED METHODS AND EQUIPMENT LEAVING AT LEAST 6" WIRE AT ALL JUNCTION BOXES FOR CONNECTIONS.

1. CLEAN OUT EACH CONDUIT SYSTEM BEFORE PULLING WIRE.

L. FORM AND TIE ALL WIRING IN PANELBOARDS.

M. THERE SHALL BE NO WIRENUT JOINTS OR SPLICES MADE INSIDE SWITCHBOARDS/PANELBOARDS.

N. BRANCH CIRCUIT WIRE SIZES (AND CONDUITS) SHALL BE INCREASED FROM THOSE INDICATED ON THE PLANS TO PREVENT EXCESSIVE VOLTAGE DROP. BRANCH CIRCUITS SHALL BE INSTALLED WITH WIRES OF SUFFICIENT SIZE SO THAT VOLTAGE DROP BETWEEN THE PANEL AND THE LOADS DOES NOT EXCEED LIMIT OF 3%.

O. REGARDLESS OF THE TEMPERATURE RATING OF THE CONDUCTOR INSULATION, ALL CONDUCTOR AMPACITY RATING FOR THIS PROJECT SHALL BE DETERMINED FROM THE 75°C CONDUCTOR TEMPERATURE RATINGS INDICATED IN THE CEC TABLES. WHERE EQUIPMENT OR DEVICES ARE PROVIDED WITH TERMINALS/LUGS RATED FOR 60°C, THE AMPACITY RATING OF THE 75°C CONDUCTOR SHALL BE LIMITED TO ITS ASSOCIATED 60°C RATING AS INDICATED IN THE CEC TABLES. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO INCREASE THE CONDUCTORS AND CONDUIT SIZE AS REQUIRED.

P. CIRCUITS MAY BE MULTI-PLEXED IN CONDUIT PROVIDED WIRE IS PROPERLY DERATED AND CONDUIT SIZED PER CODE. UNDER NO CIRCUMSTANCES SHALL MORE THAN SIX (6) CURRENT CARRYING CONDUCTORS BE RUN IN A SINGLE CONDUIT.

WIRING DEVICES :

A. WIRING DEVICE COLOR SHALL BE SELECTED BY ARCHITECT, UNLESS OTHERWISE INDICATED.

B. PROVIDE TOTALLY ENCLOSED, 20 AMPERE, 120/277 VOLT, QUIET NC GENERAL USE SNAP SWITCHES.

C. SWITCHES SHALL BE SPECIFICATION GRADE AS MANUFACTURED BY HUBBEL, P&S, OR LEVITON.

D. PROVIDE NEMA CONFIGURATION 5-20R DUPLEX 125 VOLT GROUNDING TYPE RECEPTACLES RATED FOR 20 AMPERES UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

E. RECEPTACLES SHALL BE SPECIFICATION GRADE AS MANUFACTURED BY HUBBELL, P&S, OR LEVITON.

F. RECEPTACLES REQUIRING AMPERAGES, VOLTAGES, OR CONFIGURATIONS DIFFERENT FROM THE DUPLEX CONVENIENCE RECEPTACLES ABOVE SHALL BE AS INDICATED ON THE DRAWINGS.

G. PROVIDE OTHER RECEPTACLES OF A QUALITY, MATERIAL, AND WORKMANSHIP EQUAL TO THAT SPECIFIED FOR DUPLEX CONVENIENCE RECEPTACLES.

H. PROVIDE COVER OR DEVICE PLATES FOR OUTLET BOXES AS FOLLOWS UNLESS OTHERWISE NOTED:

1. FINISHED AREAS: THERMOPLASTIC - COLOR TO MATCH DEVICE.
2. UNFINISHED AREAS: ZINC COATED SHEET METAL, ALUMINUM, OR CAST METAL AS APPROPRIATE FOR THE TYPE OF BOX.
3. EXTERIOR AREAS: COPPER FREE ALUMINUM WITH GRAY, POWDER EPOXY FINISH, GASKET, WEATHERPROOF, CROUSE-HINDS "WLRD" FOR DUPLEX RECEPTACLES AND WLRS FOR SINGLE RECEPTACLES OR EQUAL.
4. TELEPHONE, COMMUNICATION, AND SIGNAL OUTLET PLATES, SHALL MATCH THOSE USED FOR RECEPTACLES AND SWITCHES. ALL OUTLET AND/OR JUNCTION BOXES SHALL BE COMPLETE WITH A COVER PLATE BY THIS CONTRACTOR.
5. WHERE DEVICES ARE GANGED, THEY SHALL BE INSTALLED UNDER A COMMON COVERPLATE.

I. LOCATE THE SWITCHES APPROXIMATELY 4'-0" ABOVE THE FINISHED FLOOR ELEVATION OR NEAREST BLOCK COURSE (WITHIN ADA REQUIREMENTS), UNLESS OTHERWISE INDICATED. THE LONG DIMENSION OF THE SWITCHES SHALL BE VERTICAL.

J. LOCATE RECEPTACLES APPROXIMATELY 1'-6" ABOVE THE FINISHED FLOOR ELEVATION OR NEAREST BLOCK COURSE (WITHIN ADA REQUIREMENTS), UNLESS NOTED OTHERWISE. THE LONG DIMENSION OF RECEPTACLES SHALL BE VERTICAL.

RACEWAYS AND BOXES :

A. RACEWAYS

1. ALL WIRE SHALL BE RUN IN ACCORDANCE WITH CODE IN CORROSION RESISTANT, RIGID, THREADED, METAL CONDUIT, OR ELECTRICAL METALLIC TUBING (E.M.T.) UNLESS OTHERWISE SPECIFICALLY STATED HEREIN.

   a. CONDUIT IN EXTERIOR WALLS, BELOW FLOOR SLAB, OR UNDERGROUND SHALL BE RIGID, THREADED, GALVANIZED, HEAVY WALL TYPE.
   b. CARLON PVC TYPE 40 HEAVY WALL CONDUIT WITH GROUND WIRE MAY BE USED BELOW FLOOR SLAB OR UNDERGROUND IN LIEU OF RIGID, THREADED, GALVANIZED CONDUIT. PVC 40 CONDUIT SHALL NOT BE RUN IN OR ABOVE FLOOR SLAB. PVC CONDUIT SHALL TERMINATE BELOW FLOOR SLAB WITH RIGID, THREADED METAL CONDUIT ADAPTER. CONDUIT ABOVE SLAB SHALL BE METAL.
   c. CONDUIT RUN EXPOSED TO THE WEATHER SHALL BE HEAVY WALL, METAL THREADED TYPE.

2. CONDUIT SIZE SHALL BE 3/4" MINIMUM.

3. CONDUIT SHALL BE SECURELY FASTENED IN PLACE.

4. ALL CONDUIT SHALL BE CONCEALED IN WALLS, FLOOR, AND CEILINGS WHEREVER POSSIBLE. EXPOSED CONDUIT IN FINISHED AREAS WILL NOT BE PERMITTED. EXPOSED CONDUIT WILL BE PERMITTED IN THE UNFINISHED AREAS WITH THE SPECIFIC APPROVAL OF THE ARCHITECT.

5. USE FLEXIBLE CONDUIT FOR THE CONNECTION TO RECESSED OR SEMI-RECESSED LIGHTING FIXTURES (6' LENGTH MAXIMUM). USE LIQUID TIGHT METAL CONDUIT FOR ALL CONNECTIONS TO MOTORS AND OTHER EQUIPMENT SUBJECT TO VIBRATION AND IN AREAS SUBJECT TO MOISTURE.

6. USE WATERTIGHT JOINTS WITH BURIED AND CONCRETE ENCASED CONDUIT. ALL BURIED CONDUITS OUTSIDE OF BUILDINGS SHALL HAVE A MINIMUM OF 24" OF COVER. METAL CONDUITS BURIED IN EARTH SHALL BE PAINTED (TWO COATS) WITH HEAVY ASPHALTUM PAINT.

7. SUPPORT RUNS OF CONDUIT AS DETAILED IN THE APPROPRIATE TABLE OF THE NATIONAL ELECTRICAL CODE (NEC)

8. INSTALLED EXPOSED RUNS OF CONDUIT AND CONDUIT ABOVE LAY-IN CEILINGS PARALLEL OR PERPENDICULAR TO THE WALLS, STRUCTURAL MEMBERS OF INTERSECTIONS OF VERTICAL PLANES AND CEILINGS. PROVIDE RIGHT ANGLE TURNS USING FITTINGS OR SYMMETRICAL BENDS. SUPPORT CONDUITS WITHIN 1" OF ALL CHANGES IN DIRECTION.

9. IF A CONDUIT IS SUSPENDED, IT SHALL BE SUPPORTED ON TRAPEZE HANGERS WHICH USE "ALL-THREAD" RODS FROM THE STRUCTURAL STEEL. THE USE OF CEILING SUPPORT WIRE OR SIMILAR MATERIAL WILL NOT BE ACCEPTED.

10. INSTALL EMPTY CONDUIT FOR FUTURE USE AS INDICATED ON THE DRAWINGS. CONDUIT SHALL BE COMPLETE WITH JETLINE OR PULL ROPE, JUNCTION/OUTLET BOXES, TILE RINGS, AND APPROPRIATE COVER PLATES.

11. PROVIDE PITCHPOCKETS WHERE CONDUITS PENETRATE THE ROOF.

12. THREAD LUBRICATION/SEALANT IS REQUIRED ON OUTDOOR AND UNDERGROUND THREADED METAL JOINTS

13. INSTALL FIRE SEAL FITTINGS WHERE CONDUITS PENETRATE CONCRETE FLOOR SLABS OR MASONRY WALLS REQUIRED TO BE FIRE RATED.

14. HORIZONTAL PORTION OF CONDUIT EXPOSED ON THE ROOF AND FEEDING EQUIPMENT SHALL NOT BE MORE THAN 5'-0" UNLESS THE WRITTEN APPROVAL FROM ARCHITECT OR ENGINEER IS OBTAINED.

B. PULL AND JUNCTION BOXES

1. INSTALL PULL AND JUNCTION BOXES WHERE SHOWN ON THE DRAWINGS, AND WHERE REQUIRED FOR CHANGES IN DIRECTION, AT JUNCTION POINTS, AND TO FACILITATE WIRE PULLING. FURNISH BOX SIZES IN ACCORDANCE WITH CEC UNLESS LARGER BOXES ARE INDICATED.

2. PROVIDE STEEL BOXES AND REMOVABLE COVERS OF CODE GAUGE, HOT ROLLED SHEET STEEL, HOT DIPPED GALVANIZED INSIDE AND OUTSIDE, FOR ABOVE GROUND WORK. FURNISH WEATHERPROOF BOXES WHEN INSTALLED ABOVE GROUND OUTSIDE.

3. PROVIDE CAST IRON BOXES, HOT DIPPED GALVANIZED INSIDE AND OUTSIDE WHERE SHOWN ON THE DRAWINGS. FURNISH REMOVABLE COVERS WITH GASKETS AND STAINLESS STEEL, BRASS OR BRONZE SCREWS.

4. PROVIDE CONCRETE BOXES FOR UNDERGROUND WORK UNLESS OTHERWISE INDICATED ON THE DRAWINGS. FURNISH STEEL FRAMES AND COVERS WITH THE COVER ATTACHED TO THE FRAME WITH HEXAGON HEAD, BRASS OR BRONZE CAP SCREWS, 3/8" IN DIAMETER. PROVIDE A RUBBER GASKET FOR SEALING BETWEEN THE COVER AND THE FRAME. PAINT THE COVER WITH TWO COATS OF HEAVY ASPHALTUM.

C. OUTLET BOXES

1. USE SHEET STEEL BOXES, ZINC COATED OR CADMIUM PLATED, FOR CONCEALED INTERIOR WORK.

2. USE CAST BOXES, ZINC-CADMIUM FINISH MALLEABLE IRON, FOR EXPOSED INTERIOR WORK, AND FOR EXPOSED OR CONCEALED WORK IN WET, DAMP, OR EXTERIOR LOCATIONS. CAST BOXES SHALL BE SERIES FD BY CROUSE HINDS OR APPLETON.

3. WALL BOX SIZES (MINIMUM) SHALL BE 4" SQUARE X 2-1/2" DEEP WHERE WALL CONSTRUCTION PERMITS. WHERE WALL CONSTRUCTION DICTATES, THE DEPTH MAY BE REDUCED TO 2-1/8" OR 1-1/2" UNDER SPECIAL CONDITIONS.
4. FIXTURE OUTLETS IN CEILINGS (MINIMUM) SHALL BE 4" OCTAGONAL X 1-1/2" DEEP (4-11/16" OCTAGONAL X 2-1/2" DEEP WHERE REQUIRED TO ACCOMMODATE LARGER CONDUIT OR LARGER NUMBER OF WIRES).

5. GANGED BOXES SHALL BE ONE PIECE (MINIMUM), 2-1/8" DEEP.

6. PROVIDE CAST IRON, CONCRETE-TILE FLOOR BOXES WITH ADJUSTABLE COVERS SET FLUSH AND LEVEL WITH THE FINISHED FLOOR, WITH OUTLETS AS INDICATED ON THE DRAWINGS. PROVIDE HUBBELL #B-2400, 4200, OR 4300 SERIES BOXES WITH LEVELING SCREWS. FLUSH TYPE COVERS AND OPENINGS TO SERVE OUTLETS USED. FURNISH FLUSH CAPS FOR CLOSING OFF BOX WHEN NOT IN USE.

7. FLUSH MOUNT BOXES IN ALL FINISHED WALLS, INSTALL THE PLASTER RINGS IN DRYWALLED PLASTERED WALLS AND RAISED COVERS AS REQUIRED IN WALLS WITH OTHER FINISHES SO THAT THE COVER PLATES FIT TIGHTLY AGAINST BOXES OR RINGS. 3/16" MAXIMUM GAPS ARE ALLOWED FOR NONCOMBUSTIBLE WALLS.

8. ADJUST LOCATION OF OUTLETS IN MASONRY OR TILE CONSTRUCTION TO OCCUR IN THE NEAREST JOINT TO THE HEIGHT SPECIFIED. HEIGHTS SHALL MEET A.D.A. REQUIREMENTS.

9. SUPPORT ALL BOXES TO MAINTAIN PROPER ALIGNMENT AND RIGIDITY.

10. CLEAN BOXES OF ALL FOREIGN MATTER PRIOR TO THE INSTALLATION OR WIRING OF DEVICES.

11. MOUNTING HEIGHTS ON THE DRAWINGS ARE TO THE TOP OF THE BOX UNLESS OTHERWISE NOTED.

FUSES :

A. THE CONTRACTOR SHALL FURNISH A COMPLETE SET OF FUSES FOR ALL SWITCHES, PLUS FUSIBLE EQUIPMENT FURNISHED BY OTHER TRADES. UNLESS INDICATED OTHERWISE ON PLANS, THE FUSES SHALL BE OF THE FOLLOWING TYPES:

1. FUSES 601 TO 6000 AMPS SHALL BE UL CLASS. TRADE TYPE SHALL BE KRP-C AS MANUFACTURED BY BUSSMANN COMPANY.
2. FUSES 1/10 TO 600 AMPS SHALL BE UL CLASS RK1. TRADE TYPE SHALL BE LOW PEAK LPS-RK (600V) AND LPN-RK (250V) AS MANUFACTURED BY BUSSMANN COMPANY.
3. ALL OTHER FUSES SHALL BE DUAL-ELEMENT CURRENT-LIMITING TYPE WITH 200,000 AMPERES SYMMETRICAL INTERRUPTING CAPACITY.

B. FUSES SHALL BE MANUFACTURED BY BUSSMAN, GOULD-SHAWMUT, OR RELIANCE.

C. SPARE FUSES AMOUNTING TO A DUPLICATE SET OF EACH SIZE INSTALLED SHALL BE TURNED OVER TO THE OWNER UPON COMPLETION OF THE PROJECT. PROVIDE AND PLACE IN A SPARE FUSE CABINET SIMILAR TO BUSSMAN # SFC.

D. THIS CONTRACTOR SHALL REPLACE ALL FUSES BLOWN DURING CONSTRUCTION.

GROUNDING AND BONDING :

A. GROUND ALL EQUIPMENT PER C.E.C.

B. GROUND EACH OUTSIDE LIGHTING POLE SEPARATELY WITH ONE GROUND ROD AND A #6 GROUND WIRE.

C. GROUND ALL DRY TYPE TRANSFORMERS AS PER DRAWINGS AND CEC #450-10.

D. ALL CONDUITS SHALL CONTAIN A CODE-SIZED GROUND WIRE SIZE PER C.E.C. IN ADDITION TO THE CONDUCTORS SHOWN ON THE PLANS. WHERE CIRCUIT CONDUCTORS ARE INCREASED IN SIZE FOR ANY REASON (I.E. VOLTAGE DROP, DERATING, ETC.), THE GROUND WIRE SIZE SHALL BE INCREASED PROPORTIONATELY (ACCORDING TO CIRCULAR MIL AREA).

E. WHERE AN ISOLATED, INSULATED GROUND IS REQUIRED A SEPARATE ISOLATED GREEN GROUND SHALL BE RUN FROM THE PANEL ISOLATED GROUND BUS TO THE ISOLATED GROUND CONNECTION OF THE DEVICE SERVED. IN NO CASE SHALL THE SYSTEM GROUND (GREEN WIRE AND ASSOCIATED OUTLET BOXES, CONDUIT, AND BUILDING STEEL) BE ALLOWED TO CONTACT THE ISOLATE GROUND (GREEN WIRE WITH WHITE STRIPE).

TRANSFORMER :

A. BRANCH CIRCUIT AND DISTRIBUTION TRANSFORMERS SHALL BE THE DRY TYPE AND SHALL HAVE THE RATINGS INDICATED.

B. SINGLE PHASE TRANSFORMERS SHALL BE 480 VOLT PRIMARY AND 120/208 VOLT SECONDARY. THREE PHASE TRANSFORMERS SHALL BE 480 VOLT DELTA PRIMARY AND 120/208 VOLT GROUNDED TYPE SECONDARY. TRANSFORMERS 25 KVA AND LARGER SHALL HAVE A MINIMUM OF 4 1/2% CAPACITY PRIMARY TAPS.

C. TRANSFORMERS SHALL HAVE A U.L. RECOGNIZED 220 DEGREE INSULATION SYSTEM AND SHALL BE DESIGNED SO THAT UNDER FULL LOAD, THE AVERAGE CONDUCTOR TEMPERATURE RISE DOES NOT EXCEED 115 DEGREE C. RISE ABOVE A 40 DEGREE C. AMBIENT AND THE ENCLOSURE DOES NOT EXCEED A 50 DEGREE C. RISE AT ANY POINT.

D. TRANSFORMERS SHALL BE COMPLIANT WITH THE 2016 DOE EFFICIENCY STANDARDS.

E. TRANSFORMERS THAT ARE OF THE FLOOR-MOUNTED TYPE SHALL BE MOUNTED ON KORFUND VIBRATION ELIMINATORS OF THE PAD TYPE.

H. TRANSFORMERS SHALL BE AS MANUFACTURED BY SAME MANUFACTURER INSTALLED IN THE BASE BUILDING.

1 ELECTRICAL SPECIFICATIONS
N.T.S.

L'OCCITANE
EN PROVENCE

TITLE:
ELECTRICAL SPECIFICATIONS

SHEET NUMBER:
E-400

Property of NY Engineers

STATE OF CALIFORNIA
Electrical Power Distribution
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
This document is used to demonstrate compliance with mandatory requirements in 130.5, for electrical systems in newly constructed nonresidential and hotel/motel occupancies and 160.6 and 160.9 for electrical systems in newly constructed multifamily occupancies. Additions and alterations to electrical service systems in nonresidential and hotel/motel occupancies will also use this document to demonstrate compliance per 141.0(a) or 141.0(b)2P for alterations. For multifamily addition or alterations compliance will be documented per 180.1(a) or 180.2 (b)4Bvii	
Project Name: L'OCCITANE_Santa Rosa, CA	**Report Page:** **(Page 1 of 4)**
Project Address:	**Date Prepared:** 2025-09-22T11:00:30-04:00

A. GENERAL INFORMATION

01	Project Location (city)	Santa Rosa, CA	02	Climate Zone	2
			03	Occupancy Types Within Project:	Retail

B. PROJECT SCOPE

This table includes electrical systems that are within the scope of the permit application.

01	02	03	04	05	06	07
Electrical Service Designation/ Description	Scope of Work [1]	Rating[2] (kVA)	Utility Provided Metering System Exception to 130.5(a)/160.6(a)[3]	System subject to CA Elec Code Article 517 Exception to 130.5(a)and (b)	Demand Response Controls	Provides power to dwelling units/common living areas only in multifamily occupancy
Existing 100Amps, 277/480V, 3phase breaker switch & energy meter in existing main switchboard 'MSB-C1' located in building 'C1' electrical room	Add/Alt to feeders and branch circuits only	---	☐	☐	Where required, demand response controls must be specified which are capable of receiving and automatically responding to at least one standards based messaging protocol which enables demand response after receiving a demand response signal. Sections 120.2/160.3, 130.1/160.5, and 130.3/160.5, and mechanical, indoor lighting, and sign lighting Certificate of Compliance documents will indicate when demand response controls are required.	☐

[1] FOOTNOTES: Adding only new feeders and branch circuits triggers Voltage Drop 130.5(c)/160.6(c), no other requirements from 130.5/160.6 are required.
[2] If common use areas in a multifamily are submetered, rating is for submeter size serving common use areas.
[3] Applicable if the utility company is providing a metering system that indicates instantaneous kW demand and kWh for a utility-defined period.

STATE OF CALIFORNIA
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CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
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C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through J. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

01		02		03		04	05	06
Service Electrical Metering 130.5(a)/ 160.6(a) (See Table F)	AND	Separation for Monitoring 130.5(b)/ 160.6(b) (See Table G)	AND	Voltage Drop 130.5(c)/ 160.6(c) (See Table H)	AND	Controlled Receptacles 130.5(d)/ 160.6(d) (See Table I)	Electric Ready 160.9 (See Table J)	**Compliance Results**
	AND		AND	Yes	AND			COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

H. VOLTAGE DROP

This table includes entirely new or complete replacement electrical power distribution systems, or alterations that add, modify or replace both feeders and branch circuits to demonstrate compliance with 130.5(c)/ 160.6(c). For alterations, only the altered circuits must demonstrate compliance per 141.0(b)2Pii/ 180.2(b)4Bviic.

01	02				03	04	05	
Electrical Service Designation/Description	Combined Voltage Drop on Installed Feeder/Branch Circuit Conductors Compliance Method				Location of Voltage Drop Calculations[1]	Sheet Number for Voltage Drop Calculations in Construction Documents	Field Inspector	
							Pass	Fail
Existing 100Amps, 277/480V, 3phase breaker switch & energy meter in existing main switchboard 'MSB-C1' located in building 'C1' electrical room	☒	Voltage drop less than 5%	☐	Permitted by CA Elec Code (Exception to 130.5(c))*	Contractor Responsible		☐	☐

** NOTES: If "Permitted by CA Elec Code *" is selected under Compliance Method above, please indicate where the exception applies in the space provided below.*

[1] FOOTNOTES: Voltage drop calculations may be attached to the permit application outside the construction documents if allowed by the Authority Having Jurisdiction. Select "attached" if applicable. If calculations will be the responsibility of the installing contractor, select "Contractor Responsible".

STATE OF CALIFORNIA
Electrical Power Distribution
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CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
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K. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-ELC-E - Must be submitted for all buildings

L. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

There are no NRCA forms required for this project.

STATE OF CALIFORNIA
Electrical Power Distribution
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
Project Name: L'OCCITANE_Santa Rosa, CA	**Report Page:** **(Page 4 of 4)**
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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Michael Tobias	Documentation Author Signature:
Company: NY Engineers	Signature Date:
Address: 382 NE 191ST Street Suite 49674	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: Miami, FL 33179	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Michael Tobias	Responsible Designer Signature:
Company: NY Engineers	Date Signed:
Address: 382 NE 191ST Street Suite 49674	License:
City/State/Zip: Miami, FL 33179	Phone:

Property of NY Engineers

L'OCCITANE
EN PROVENCE

TITLE:
ENERGY ANALYSIS (TITLE 24)

SHEET NUMBER:
E-500

STATE OF CALIFORNIA
Electrical Power Distribution
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
This document is used to demonstrate compliance with mandatory requirements in 130.5, for electrical systems in newly constructed nonresidential and hotel/motel occupancies and 160.6 and 160.9 for electrical systems in newly constructed multifamily occupancies. Additions and alterations to electrical service systems in nonresidential and hotel/motel occupancies will also use this document to demonstrate compliance per 141.0(a) or 141.0(b)2P for alterations. For multifamily addition or alterations compliance will be documented per 180.1(a) or 180.2 (b)4Bvii	
Project Name: L'OCCITANE_Santa Rosa, CA	**Report Page:** **(Page 1 of 4)**
Project Address:	**Date Prepared:** 2025-09-22T11:00:30-04:00

A. GENERAL INFORMATION

01	Project Location (city)	Santa Rosa, CA	02	Climate Zone	2
			03	Occupancy Types Within Project:	Retail

B. PROJECT SCOPE

This table includes electrical systems that are within the scope of the permit application.

01	02	03	04	05	06	07
Electrical Service Designation/ Description	Scope of Work [1]	Rating[2] (kVA)	Utility Provided Metering System Exception to 130.5(a)/160.6(a)[3]	System subject to CA Elec Code Article 517 Exception to 130.5(a)and (b)	Demand Response Controls	Provides power to dwelling units/common living areas only in multifamily occupancy
Existing 100Amps, 277/480V, 3phase breaker switch & energy meter in existing main switchboard 'MSB-C1' located in building 'C1' electrical room	Add/Alt to feeders and branch circuits only	---	☐	☐	Where required, demand response controls must be specified which are capable of receiving and automatically responding to at least one standards based messaging protocol which enables demand response after receiving a demand response signal. Sections 120.2/160.3, 130.1/160.5, and 130.3/160.5, and mechanical, indoor lighting, and sign lighting Certificate of Compliance documents will indicate when demand response controls are required.	☐

[1] FOOTNOTES: Adding only new feeders and branch circuits triggers Voltage Drop 130.5(c)/160.6(c), no other requirements from 130.5/160.6 are required.
[2] If common use areas in a multifamily are submetered, rating is for submeter size serving common use areas.
[3] Applicable if the utility company is providing a metering system that indicates instantaneous kW demand and kWh for a utility-defined period.

STATE OF CALIFORNIA
Electrical Power Distribution
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
Project Name: L'OCCITANE_Santa Rosa, CA	**Report Page:** **(Page 2 of 4)**
	Date Prepared: 2025-09-22T11:00:30-04:00

C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through J. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

01		02		03		04	05	06
Service Electrical Metering 130.5(a)/ 160.6(a) (See Table F)	AND	Separation for Monitoring 130.5(b)/ 160.6(b) (See Table G)	AND	Voltage Drop 130.5(c)/ 160.6(c) (See Table H)	AND	Controlled Receptacles 130.5(d)/ 160.6(d) (See Table I)	Electric Ready 160.9 (See Table J)	**Compliance Results**
	AND		AND	Yes	AND			COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

H. VOLTAGE DROP

This table includes entirely new or complete replacement electrical power distribution systems, or alterations that add, modify or replace both feeders and branch circuits to demonstrate compliance with 130.5(c)/ 160.6(c). For alterations, only the altered circuits must demonstrate compliance per 141.0(b)2Pii/ 180.2(b)4Bviic.

01	02				03	04	05	
Electrical Service Designation/Description	Combined Voltage Drop on Installed Feeder/Branch Circuit Conductors Compliance Method				Location of Voltage Drop Calculations[1]	Sheet Number for Voltage Drop Calculations in Construction Documents	Field Inspector	
							Pass	Fail
Existing 100Amps, 277/480V, 3phase breaker switch & energy meter in existing main switchboard 'MSB-C1' located in building 'C1' electrical room	☒	Voltage drop less than 5%	☐	Permitted by CA Elec Code (Exception to 130.5(c))*	Contractor Responsible		☐	☐

** NOTES: If "Permitted by CA Elec Code *" is selected under Compliance Method above, please indicate where the exception applies in the space provided below.*

[1] FOOTNOTES: Voltage drop calculations may be attached to the permit application outside the construction documents if allowed by the Authority Having Jurisdiction. Select "attached" if applicable. If calculations will be the responsibility of the installing contractor, select "Contractor Responsible".

STATE OF CALIFORNIA
Electrical Power Distribution
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
Project Name: L'OCCITANE_Santa Rosa, CA	**Report Page:** **(Page 3 of 4)**
	Date Prepared: 2025-09-22T11:00:30-04:00

K. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-ELC-E - Must be submitted for all buildings

L. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

There are no NRCA forms required for this project.

STATE OF CALIFORNIA
Electrical Power Distribution
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
Project Name: L'OCCITANE_Santa Rosa, CA	**Report Page:** **(Page 4 of 4)**
Project Address:	**Date Prepared:** 2025-09-22T11:00:30-04:00

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Michael Tobias	Documentation Author Signature:
Company: NY Engineers	Signature Date:
Address: 382 NE 191ST Street Suite 49674	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: Miami, FL 33179	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
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City/State/Zip: Miami, FL 33179	Phone:

Property of NY Engineers

3

L'OCCITANE
EN PROVENCE

TITLE: 3
ELECTRICAL POWER DISTRIBUTION ANALYSIS (TITLE 24)

SHEET NUMBER: 3
E-501