



ABBREVIATIONS

ABS -	ACRYLONITRILE - BUTADIENE -STYRENE	HDR -	HEADER
ABV -	ABOVE	H.B. -	HOSE BIBB
ACC -	ACCESSIBLE	HP -	HORSEPOWER RATING.
AFF -	ABOVE FINISHED FLOOR	HRV -	HEAT RECOVERY WHEEL
AFG -	ABOVE FINISHED GRADE	J-BOX -	JUNCTION BOX.
AHU -	AIR HANDLING UNIT	KA -	KILO AMPERES.
AP -	ACCESS PANEL	KW -	KILOWATT.
BAD -	BYPASS DAMPER	KVA -	KILO-VOLT AMPS.
BEL -	BELOW	LAN -	LOCAL AREA NETWORK
BEH -	BEHIND	LGT -	LIGHTING.
CD -	CONDENSATE DRAIN	LCL -	LONG CONTINUOUS LOAD
CFM -	CUBIC FEET PER MINUTE	L.O. -	LUGS ONLY.
C.I. -	CAST IRON CLG. CEILING C.O. - CONDUIT ONLY.	LV -	LOW VOLTAGE.
CON -	CONNECT/CONNECTION CONT. - CONTINUATION	MH -	MOUNTING HEIGHT (TO BOTTOM OF FIXTURE)
CB -	CIRCUIT BREAKER.	MC -	MOMENTARY CONTACT ACTION.
CKT -	CIRCUIT.	MVD -	MANUAL VOLUME DAMPER
CU -	COPPER.	MTD -	MOUNTED
DA -	DISABLED ACCESS	(N) -	NEW
DF -	DRINKING FOUNTAIN	N.C. -	NORMALLY CLOSED
DN -	DOWN	NEC -	NATIONAL ELECTRICAL CODE.
DOAS -	DEDICATED OUTDOOR AIR SYSTEM D.A. - DISTRIBUTION PANEL.	NL -	NIGHT LIGHT.
EC -	ELECTRICAL CONTRACTOR	NTS -	NOT IN CONTRACT
ECC -	ENVIRONMENTAL CONTROL CONTRACTOR	OFCl -	OWNER FURNISHED CONTRACTOR INSTALLED
EM -	EMERGENCY	RTU -	ROOF TOP UNIT
EMCS -	ENERGY MANAGEMENT CONTROL SYSTEM	RA -	RETURN AIR
EF -	EXHAUST FAN	SA -	SUPPLY AIR.
(E) -	EXISTING	SSS -	SATIN STAINLESS STEEL.
(ER) -	EXISTING DEVICE TO BE REPLACED	TEL -	TELEPHONE
FA -	FIRE ALARM.	TL -	TWIST-LOCK CONSTRUCTION TYPICAL.
FCU -	FAN COIL UNIT	UON -	UNLESS OTHERWISE NOTED.
FLR -	FLOOR	V -	VOILTS
FD -	FLOOR DRAIN	VTR -	VENT THROUGH ROOF
FU -	FIXTURE UNIT	WMS -	WIRE MESS SCREEN
FV -	FLOOR VALVE	W.P. -	WEATHERPROOF CONSTRUCTION.
F.H.C. -	FIRE HOSE CABINET	WT -	WEATHERTIGHT CONSTRUCTION.
GND -	GROUND.	OA -	OUTSIDE AIR.
GRD -	GRADE	EA -	EXHAUST AIR.
GPM -	GALLONS PER MINUTE	TR -	TRANSFER AIR.
		VRV -	VARIABLE REFRIGERANT VOLUME
		KEF -	KITCHEN EXHAUST FAN

GENERAL EQUIPMENT NOTES

ALL EQUIPMENT REQUIRING VFD'S OR STARTERS SHALL BE PROVIDED WITH THE EQUIPMENT. VFD'S SHALL BE EQUIPPED WITH INTEGRAL DISCONNECTS. ANY OUTDOOR VFD'S SHALL BE PROVIDED WITH NEMA 3R ENCLOSURE. COORDINATE WITH EC TO PROVIDE POWER FOR THE ENCLOSURE (IF NEEDED).

UNLESS NOTED OTHERWISE, EQUIPMENT SHALL COME WITH INTEGRAL DISCONNECTS AND SINGLE POINT ELECTRICAL CONNECTIONS.

COORDINATE ANY CHANGES OF EQUIPMENT LOCATIONS, SELECTIONS AND RFIS WITH THE ELECTRICAL AND PLUMBING CONTRACTORS AND OTHER TRADES.

A PERFORMANCE TEST SHALL BE CONDUCTED UPON COMPLETION AND BEFORE FINAL APPROVAL OF THE INSTALLATION OF A VENTILATION SYSTEM SERVING COMMERCIAL COOKING APPLIANCE IN ACCORDANCE WITH CMC 511.2.2.1

THE PERMIT HOLDER SHALL VERIFY THE CAPTURE AND CONTAINMENT PERFORMANCE OF TYPE I HOODS IN ACCORDANCE WITH CMC 511.2.2.2

ENERGY NOTES

- MOTORIZED DAMPERS SHALL BE INSTALLED ON ALL INTAKES AND EXHAUST OPENINGS UNLESS NOTED OTHERWISE.
- MAXIMUM FAN NAMEPLATE HORSEPOWER SHALL NOT EXCEED 1.1 HP/1000CFM.
- LOAD CALCULATIONS WERE BASED ON ASHRAE FUNDAMENTALS
- ALL PROGRAMMABLE THERMOSTATS SHALL HAVE 5 DEGREE DEADBAND AND SHALL HAVE 7-DAY CLOCK, 2-HOUR MANUAL OVERRIDE, 10 HOUR BACKUP AND SETBACK CAPABLE OF 55 DEGREES HEATING AND 85 DEGREES COOLING. (EXCEPT CONTINUOUS OPERATING ZONES)
- DUCT INSULATION AS SPECIFIED WITH MINIMUM VALUES AS FOLLOWS:
 - R-8 SUPPLY AND RETURN DUCT INSULATION IN UNCONDITIONED SPACES.
 - R-8 SUPPLY AND RETURN DUCT INSULATION FOR EXTERIOR DUCTS.
 - R-4.2 SUPPLY AND RETURN DUCT INSULATION UNDERGROUND.
- ALL DUCTWORK SHALL BE SEALED PRESSURE SENSITIVE TAPE IS NOT USED AS THE PRIMARY SEALANT. LONGITUDINAL AND TRANSVERSE SEAMS FOR DUCTS IN UNCONDITIONED SPACES AND WALL PENETRATIONS. TRANSVERSE SEAMS ON BURIED DUCTS.

INSULATION SCHEDULE

ALL EXPOSED DUCTWORK IN CONDITIONED SPACES	NONE
ALL EXTERIOR DUCTWORK	MIN. R-8
ALL CONCEALED SUPPLY AND RETURN DUCT	MIN. R-8

MECHANICAL SYMBOLS

ALL SYMBOLS SHOWN MAY NOT APPEAR IN ALL DRAWINGS. SYMBOLS ARE SHOWN SCHEMATIC AND MAY NOT BE TO SCALE.

SYMBOL	DESCRIPTION
	DUCT
	SUPPLY DIFFUSER
	RETURN OR EXHAUST GRILLE
	SLOT DIFFUSER
	FLEXIBLE DUCT
	CO2 SENSOR
	THERMOSTAT
	EMS SENSOR
	HUMIDISTAT
	STATIC PRESSURE SENSOR
	SMOKE DETECTOR
	45° PRESSURE TAP WITH VOLUME DAMPER
	MANUAL VOLUME DAMPER
	MOTORIZED DAMPER
	BAROMETRIC DAMPER
	FIRE/SMOKE DAMPER
	FIRE DAMPER
	SMOKE DAMPER
	CONDENSATE DRAIN
	BACKDRAFT DAMPER
	DIRECTION OF FLOW

CALIFORNIA BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF THE CALIFORNIA BUILDING CODE 2022, AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

- ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
- VENTILATION FOR ALL AREA SHALL COMPLY WITH CALIFORNIA ENERGY CODE 2022, SECTION 120.1-REQUIREMENTS FOR VENTILATION AND INDOOR AIR QUALITY.
- MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
- A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE.
- SMOKE DETECTION SYSTEMS SHALL BE INSTALLED AND SEQUENCED TO FOLLOW CONTROLS OPERATIONS WITH THE REQUIREMENTS OF SECTION 609 OF CALIFORNIA MECHANICAL CODE 2022 TO CLOSE DAMPERS AND AUTOMATICALLY STOP THE FAN.
- REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
- THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
- TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE CALIFORNIA MECHANICAL CODE 2022:
 - VENTILATION SYSTEM BALANCING CALIFORNIA MECHANICAL CODE 2022 - 314
 - SMOKE CONTROL SYSTEMS - CALIFORNIA MECHANICAL CODE 2022 - 609
- THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
 - DUCT CONSTRUCTION AND INSTALLATION - CALIFORNIA MECHANICAL CODE 2022 - 603
 - AIR INTAKES, EXHAUSTS AND RELIEF - CALIFORNIA MECHANICAL CODE 2022 - 502.
 - AIR FILTERS - CALIFORNIA MECHANICAL CODE 2022 - 401
 - MANUAL AND AUTOMATIC FIRE AND SMOKE CONTROLS FOR AIR DISTRIBUTION SYSTEMS - CALIFORNIA MECHANICAL CODE 2022 - 606, 609.
 - GAS FIRED EQUIPMENT - CALIFORNIA MECHANICAL CODE 2022 - 903.
- OPERATION AND CONTROL REQUIREMENTS FOR MINIMUM QUANTITIES OF OUTDOOR AIR.

TIMES OF OCCUPANCY - THE MINIMUM RATE OF OUTDOOR AIR REQUIRED BY SECTION 120.1(C) SHALL BE SUPPLIED TO EACH SPACE AT ALL TIMES WHEN THE SPACE IS USUALLY OCCUPIED.
- ALL MECHANICAL EQUIPMENT SHALL BE TESTED BY A CALIFORNIA CERTIFIED ACCEPTANCE TEST TECHNICIAN.

SEISMIC NOTES

- CONTRACTOR SHALL PROVIDE COMPLETE SEISMIC ANCHORAGE AND BRACING FOR ALL REQUIRED CONDUIT AND EQUIPMENT.
- CONTRACTOR SHALL COMPLY WITH THE SUPPORT AND ANCHORAGE OF EQUIPMENT AS SHOWN ON DRAWINGS. IF THERE IS NO ANCHORAGE DETAIL SHOWN ON THE DRAWINGS, SUBMIT SHOP DRAWINGS IF THE FOLLOWING APPLY:
 - EQUIPMENT WITH AN OPERATING WEIGHT OVER 40 POUNDS AND IS MOUNTED DIRECTLY ON THE FLOOR OR ROOF.
 - EQUIPMENT WITH AN OPERATING WEIGHT OVER 20 POUNDS AND IS SUSPENDED FROM THE CEILING, STRUCTURE, ROOF, FLOOR, OR WALL OR IS SUPPORTED BY SPRINGS ISOLATION DEVICES.
 - THE CONTRACTOR SHALL SUBMIT THE ANCHORAGE DETAILS AND CALCULATIONS FOR ITEMS NOT SHOWN ON THE DRAWINGS AND FOR ALL SUBSTITUTED EQUIPMENT THAT IS GREATER IN WEIGHT OR VARIES MORE THAN 10% IN LENGTH.
- THE CALCULATIONS AND DETAIL SUBMITTALS SHALL BE SEALED AND SIGNED BY A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA. THE CALCULATIONS SHALL DEMONSTRATE THE FOLLOWING:
 - THE ADEQUACY OF ANCHORAGE UNDER ALL APPLICABLE LOAD CONDITIONS PRESCRIBED BY THE CALIFORNIA BUILDING CODE.
 - THE STRUCTURAL ELEMENTS, WHICH ARE RESISTING THE ANCHORAGE LOADS, SUCH AS CONCRETE FILL ON METAL DECK AND/OR STEEL BEAMS, ARE NOT STRESSED BEYOND ITS ACCEPTABLE VALUE.
- FOR ALL VIBRATION ISOLATORS AND THEIR ANCHORAGES, THE CONTRACTOR SHALL PROVIDE CALCULATIONS, DETAILS AND TEST DATA TO SUBSTANTIATE THE ISOLATOR'S CAPACITY FOR VERTICAL AND LATERAL LOADS. CALCULATIONS MUST ALSO BE SUBMITTED TO SUBSTANTIATE THE SIZE, QUANTITY, LOCATION AND CONNECTION TO STRUCTURE. THE DRAWINGS MUST BE MADE CONSISTENT WITH THE CALCULATIONS. THE MANUFACTURER, EQUIPMENT AND STRUCTURAL ATTACHMENT PROCEDURE MUST BE CLEARLY SPECIFIED. ISOLATORS WHICH SUPPORT A COMPONENT INSIDE THE ACTUAL UNIT WILL NOT BE REVIEWED.
- WHERE CONCRETE AND MASONRY EXPANSION OR ADHESIVE TYPE ANCHORS ARE USED, THE ANCHORAGE DETAILS AND CALCULATIONS SHALL INDICATE THE MANUFACTURER, ICC REPORT NO., TYPE, DIAMETER, MINIMUM EMBEDMENT, CONCRETE TYPE AND STRENGTH.
- WHEN INSTALLING DRILLED-IN ANCHORS IN EXISTING NON-PRESTRESSED REINFORCED CONCRETE, USE CARE AND CAUTION TO AVOID CUTTING DR DAMAGING THE EXISTING REINFORCING BARS. LOCATE REINFORCEMENT BY USING A NON-DESTRUCTIVE METHOD PRIOR TO INSTALLATION. MAINTAIN A MINIMUM CLEARANCE OF ONE INCH BETWEEN THE REINFORCEMENT AND THE DRILLED-IN ANCHOR AND/OR PIN.
- NO POWER DRIVEN FASTENERS AND/OR SHOT PINS ARE ALLOWED FOR HANGING EQUIPMENT, DUCTWORK AND PIPING SYSTEMS.
- ALL EXPANSION ANCHORS SHALL HAVE 50% OF THE BOLTS TESTED. IF ANY ANCHOR FAILS TESTING, TEST ALL ANCHORS UNTIL 20 CONSECUTIVE PASS, THEN RESUME THE MINIMAL TESTING FREQUENCY. TESTING SHALL OCCUR 24 HOURS MINIMUM AFTER INSTALLATION OF THE SUBJECT ANCHORS, IN ACCORDANCE WITH IR19-1.
- FOR ANCHORAGE USE HILTI KWIK BOLT T22 EXPANSION ANCHORS ICC ESR-4266.1
- THE SEISMIC ANCHORAGE OF MECHANICAL EQUIPMENT SHALL CONFORM TO 2022 CBC SECTIONS 1617A.1.25 AND 1617A.1.26.
- PER THE CBC PAD MOUNTED EQUIPMENT WEIGHING LESS THAN 400 LBS WITH FLEXIBLE CONNECTIONS BETWEEN EQUIPMENT AND DUCTWORK / PIPING SHALL BE EXEMPT FROM JUSTIFYING ANCHORAGE.

CALIFORNIA CODES AND STANDARDS

TITLE 24 C.C.R. PART2	2022 CALIFORNIA BUILDING CODE (CBC)
TITLE 24 C.C.R. PART3	2022 CALIFORNIA ELECTRICAL CODE (CEC)
TITLE 24 C.C.R. PART4	2022 CALIFORNIA MECHANICAL CODE (CMC)
TITLE 24 C.C.R. PART5	2022 CALIFORNIA PLUMBING CODE (CPC)
TITLE 24 C.C.R. PART6	2022 CALIFORNIA ENERGY CODE
TITLE 24 C.C.R. PART9	2022 CALIFORNIA FIRE CODE (CFC)
TITLE 24 C.C.R. PART10	2022 CALIFORNIA EXISTING BUILDING CODE
TITLE 19, C.C.R.	PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.

MOST RECENTLY ACCEPTED VERSIONS OF THE FOLLOWING CODES AND STANDARDS:

GSA P100	2018 FACILITIES STANDARDS FOR PUBLIC BUILDINGS SERVICE (W / 10/01/19 ADDENDUM)
NFPA 70	NATIONAL ELECTRICAL CODE
NFPA 72	NATIONAL FIRE ALARM AND SIGNALING CODE
NFPA 80	FIRE DOORS AND OTHER OPENING PROTECTIVES
NFPA 101	LIFE SAFETY CODE
UL 300	FIRE TESTING OF FIRE EXTINGUISHING SYSTEMS FOR PROTECTION
UL 464	AUDIBLE SIGNALING DEVICES FOR FIRE ALARM AND SIGNALING SYSTEMS
IEEE 3003.2	RECOMMENDED PRACTICE FOR EQUIPMENT GROUNDING & BONDING IN INDUSTRIAL & COMMERCIAL POWER SYSTEMS
IEEE 3001.5	RECOMMENDED PRACTICE FOR THE APPLICATION OF POWER DISTRIBUTION APPARATUS IN INDUSTRIAL & COMMERCIAL POWER SYSTEMS
NECA 1	STD PRACTICE OF GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION

NATIONAL ELECTRICAL SAFETY CODE (NEC)

MECHANICAL SHEET LIST

M-001 - GENERAL NOTES, LEGENDS AND ABBREVIATIONS
M-002 - SPECIFICATIONS - MECHANICAL
M-100 - MECHANICAL FLOOR PLAN
M-101 - MECHANICAL ROOF PLAN
M-500 - DETAILS - MECHANICAL (1 OF 6)
M-501 - DETAILS - MECHANICAL (2 OF 6)
M-502 - DETAILS - MECHANICAL (3 OF 6)
M-503 - DETAILS - MECHANICAL (4 OF 6)
M-504 - DETAILS - MECHANICAL (5 OF 6)
M-505 - DETAILS - MECHANICAL (6 OF 6)
M-600 - MECHANICAL SCHEDULES
M-700 - TITLE 24 - MECHANICAL
M-701 - TITLE 24 - MECHANICAL
M-702 - TITLE 24 - MECHANICAL

MECHANICAL NOTES

- DRAWINGS:
 - THE DRAWINGS FOR HVAC WORK ARE DIAGRAMMATIC ONLY. THEY ARE INTENDED TO INDICATE EQUIPMENT REQUIRED, CAPACITY, SIZE, LOCATION, DIRECTION, AND GENERAL ARRANGEMENT, BUT NOT EXACT DETAILS OF CONSTRUCTION.
 - THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENT AS THE PRINTING PROCESS DISTORTS THE SCALE. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS TO LAY OUT OR DIMENSIONS SUPPLIED TO THE CONTRACTOR. VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO START OF INSTALLATION OR ORDERING OF EQUIPMENT.
 - THE MECHANICAL CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND NOTIFY ARCHITECT OF RECORD OF ANY DISCREPANCIES FOUND BEFORE STARTING WORK.
- SUPPORTS AND ISOLATION:
 - ALL EQUIPMENT SHALL BE PROPERLY SUPPORTED AND ISOLATED TO PREVENT NOISE AND VIBRATION TRANSMISSION. VIBRATING, OSCILLATING AND OTHER NOISE PRODUCING EQUIPMENT SHALL BE ISOLATED FROM SYSTEMS AND SURROUNDING STRUCTURE IN AN APPROVED MANNER. NOISY OR STRUCTURALLY DAMAGING INSTALTIONS SHALL BE REPLACED OR REPAIRED AT MECHANICAL CONTRACTOR'S EXPENSE. FINAL APPROVAL OF THE INSTALLATION SHALL BE THAT OF THE ARCHITECT/ENGINEER.
 - ALL AIR HANDLING EQUIPMENT SHALL BE SUPPORTED WITH SPRING ISOLATORS.
 - DETAILS FOR EQUIPMENT PADS, PLATFORMS, AND FLASHINGS SHALL BE AS INDICATED BY THE ARCHITECTURAL/STRUCTURAL/CIVIL DRAWINGS, UNLESS NOTED OTHERWISE.
- DUCTWORK SYSTEMS:
 - PROVIDE ALL DUCTWORK INSULATION MATERIALS, CONNECTIONS, DEVICES ACCESSORIES, FITTINGS, OFFSETS, TRANSITIONS, DAMPERS AS REQUIRED FOR COMPLETE WORKABLE DUCT SYSTEMS.
 - ALL AIRSIDE EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND APPROVED LISTING.
 - ALL DUCT SIZES ARE CLEAR INSIDE DIMENSIONS. DUCTWORK SHALL BE CONSTRUCTED, ERECTED, INSULATED AND TESTED IN ACCORDANCE WITH THE 2006 INTERNATIONAL MECHANICAL CODE AND 2006 INTERNATIONAL ENERGY CODE.
 - ALL SUPPLY, RETURN AND EXHAUST AIR DUCT JOINTS SHALL BE CONSTRUCTED USING TRANSVERSE DUCT CONNECTION, OR PYRAMID-LOC DUCT CONNECTIONS WHERE POSSIBLE BE A LEAK FREE INSTALLATION.
 - EQUIPMENT LOCATED WITHIN THE CEILING SPACES WITH ADEQUATE CLEARANCES FOR REPAIR AND MAINTENANCE.
 - DUCT SYSTEMS LOCATED WITHIN THE CEILING SPACES WITH ADEQUATE CLEARANCES FOR REPAIR AND MAINTENANCE OF TERMINALS AND DEVICES.
 - THE ENTIRE AIR DISTRIBUTION SYSTEM INCLUDING SUPPLY, RETURN AND EXHAUST DUCTWORK, GRILLES AND DIFFUSERS, AIR TERMINAL DEVICES, AND ALL COMPONENTS OF THE AHU SHALL BE MAINTAINED DUST FREE AND GRIT FREE DURING THE COURSE OF CONSTRUCTION PERIOD. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING OF ALL COMPONENTS TO ARCHITECT/ENGINEER SATISFACTION PRIOR TO START-UP OF THE SYSTEM.
 - PROVIDE BALANCING DAMPERS AT ALL BRANCH TAKEOFFS AND OTHER LOCATIONS AS REQUIRED FOR A COMPLETE BALANCEABLE AIR DISTRIBUTION. SUCH DAMPERS SHALL BE PROVIDED REGARDLESS OF WHETHER OR NOT THEY ARE SPECIFICALLY SHOWN ON THE DRAWINGS.
 - PROVIDE SPLITTER DAMPERS AT TEES AND RADIUS ELBOWS. PROVIDE TURNING VANES WITH ACCESS DOORS AT SQUARE ELBOWS ONLY WHEN RADIUS ELBOWS CANNOT BE INSTALLED. TURNING VANES SHALL NOT BE INSTALLED IN ANY GREASE-LADEN DUCTWORK, SUCH AS KITCHEN EXHAUST SYSTEMS.
 - MAXIMUM LENGTH OF FLEXIBLE DUCT AT SUPPLY/RETURN AIR DEVICES SHALL NOT BE GREATER THAN BE 4'-0".
 - DUCTWORK ARRANGEMENTS SHOWN ON THE DRAWINGS HAVE BEEN DESIGNED TO MINIMIZE NOISE IN THE SYSTEM. INSTALLATION SHALL NOT VARY FROM THOSE SHOWN WITHOUT WRITTEN APPROVAL FROM THE ENGINEER.
 - ALL TAKE-OFFS SHALL BE EXTENDED PLENUM HAVING GRADUAL TRANSITION SIZE CHANGES. DIFFUSERS AND GRILLES SHALL BE SIZED FOR MAX. N.C. OF 25. PROVIDE EXTENDED PLENUM TAKE-OFFS AT ALL BRANCHES ON SUPPLY, RETURN AND EXHAUST DUCTS.
 - SUPPLY AND RETURN DUCTS SHALL BE INSULATED AS SPECIFIED. ALL EXHAUST DUCTS WITHIN 10'-0" OF ROOF PENETRATION SHALL ALSO BE INSULATED WITH DUCTWRAP.
 - THE GENERAL CONTRACTOR SHALL PROVIDE ALL LOUVERS. LOUVER SIZES AT ALL MECHANICAL ROOMS HAVE BEEN SHOWN ON ARCHITECTURAL DRAWINGS. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR USING LOUVER AREA FOR EACH FUNCTION AS SPECIFIED AND BLANK OFF UNUSED LOUVER AREA WITH INSULATED PANELS CONSISTING OF 20 GA. ALUMINIUM AND 1" RIGID/3.0 PCF FIBERGLASS INSULATION WITH FSK FACING.
 - INSTALL NO DUCTWORK IN A LOCATION OR IN A MANNER WHICH SHALL ALLOW WATER TO WATER TO FREEZE, OR HAVE CONDENSATION COLLECT THEREIN OR THEREON.
 - WHERE PENETRATING ROOFING MEMBRANE OR OTHER MATERIALS USED FOR WEATHERPROOFING THE BUILDING, MAKE SUCH PENETRATIONS IN A MANNER THAT SHALL NOT VOID OR DIMINISH THE WARRANTY OF THE MATERIAL PENETRATED. COORDINATE ALL SUCH PENETRATIONS WITH THE ROOFING OR MATERIAL INSTALLER.
 - ACOUSTIC DUCT LINING USED IN AIR SYSTEMS SHALL BE NON-FIBERGLASS MATERIAL IMPREGNATED WITH AN ANTIMICROBIAL AGENT AND, ABOVE 6 M/S (1200 FPM), COVERED BY AN INTERNAL PERFORATED SHEET METAL LINER.

COORDINATION

CONTRACTORS SHALL PROVIDE COORDINATION DRAWINGS PRIOR TO DISTRIBUTION OF SUBMITTALS AND ORDERING EQUIPMENT. COORDINATION DRAWINGS SHALL SHOW CLEAR INDICATED OF COORDINATION WITH OTHER TRADES, INCLUDING STRUCTURAL, CEILINGS, AND FIRE PROTECTION. ANY CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER / ARCHITECT /ENGINEER PRIOR TO ROUGH-IN OR ORDERING OF EQUIPMENT.

MAINTAIN MANUFACTURER RECOMMENDED CLEARANCES AND ACCESS TO ALL REMOVABLE PANELS AND DOORS.

ALL FILTERS SHALL BE FULL SIZE AND STANDARD SIZE AND ACCESS SHALL ALLOW FOR EASY REPLACEMENT OF FILTERS.

GENERAL NOTES

- ALL WORK SHALL BE IN STRICT ACCORDANCE WITH ALL LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AND LISTED LIST OF CALIFORNIA CODE OF REGULATIONS (C.C.R.).
- BEFORE STARTING ANY WORK, VERIFY THE ADEQUACY, LOCATION, SIZE, AND AVAILABILITY OF ALL UTILITIES CONCERNED.
- DRAWINGS INDICATE SIZE AND TERMINATION OF PIPING AND SUGGEST PROPER ROUTES OF PIPING TO CONFORM TO THE STRUCTURE TO AVOID OBSTRUCTION AND TO PRESERVE CLEARANCE. IT IS NOT THE INTENT TO INDICATE ALL NECESSARY OFFSETS AND IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL PIPING IN SUCH A MANNER AS TO CONFORM TO STRUCTURE, AVOID OBSTRUCTIONS, PRESERVE HEADROOM, KEEP OPENINGS AND PASSAGEWAYS CLEAR AND MAKE ALL EQUIPMENT REQUIRING SEAL-INSPECTION, MAINTENANCE AND REPAIR ACCESSIBLE WITHOUT FURTHER INSPECTIONS OR ADDITIONAL COST.
- ALL WORK THAT INVOLVES "SHUT-DOWN" OF EXISTING UTILITIES OR PORTIONS THEREOF, SHALL BE DONE AT SUCH TIMES THAT WILL CAUSE THE LEAST INCONVENIENCE TO THE SITE ACTIVITIES. THE EXACT TIME AND LENGTH OF "SHUT-DOWN" SHALL BE PRE-ARRANGED WITH THE SITE AT LEAST 72 HOURS IN ADVANCE OF THE REQUIRED SHUT-DOWN.
- ALL PIPING SHALL BE SEISMICALLY RESTRAINED IN ACCORDANCE WITH THE REQUIREMENTS OF THE "SMACNA" GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL AND PLUMBING PIPING SYSTEMS.
- EXPOSED HOT WATER SUPPLY PIPES, TRAP AND TRAP ARM AT "ACC" OR "D.A." LAVATORIES WITH HOT WATER SHALL BE INSULATED.
- ALL WELDING SHALL BE SPECIALLY INSPECTED BY AN AWS-CWI QUALIFIED INSPECTOR APPROVED AND IN COMPLIANCE WITH 2022 CBC SECTION 1705A.2.
- ALL BRACING OF PIPING SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA GUIDELINES.
- WHERE BRACING DETAILS ARE NOT SHOWN ON THE DRAWINGS OR IN THE GUIDELINES, THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
- UPON COMPLETION OF PROJECT, CONTRACTOR SHALL PROVIDE OWNER WITH WRITTEN CERTIFICATION THAT ALL MATERIALS USED ON THIS PROJECT ARE ASBESTOS FREE.
- PROVIDE PROPER SLEEVING AND WALKING TO ALL NEW WATER PIPING PASSING THROUGH SLAB ON GRADE AND WALLS
- CONTRACTOR TO COMPLY WITH ALL APPLICABLE SAFETY LAWS (OSHA, CAL OSHA ETC.).
- WHEN CONTRACTOR HAS BEEN AWARDED THE CONTRACT, IT IS HIS RESPONSIBILITY TO SECURE THE AREAS SO NO UNAUTHORIZED PERSONNEL GAIN ACCESS TO THE PROJECT AREA OR THE CONTRACTORS STAGING AREA.
- THE WORK AREA SHALL BE CLEANED DAILY AND ALL CONSTRUCTION DEBRIS SHALL BE DISPOSED OF BY THE CONTRACTOR AT LEGAL DUMP. AT CONCLUSION OF PROJECT CONTRACTOR SHALL LEAVE WORK AREA AND SITE, BROOM CLEAN.
- PROTECT-IN PLACE AND CARE FOR LAWNS SHRUBS, ETC, IN THE CONSTRUCTION AREAS DURING CONSTRUCTION PERIOD. REPLACE ALL DAMAGED ITEMS AT NO COST TO OWNER.
- AT NO TIME DURING THE WORK UNDER THE CONTRACT SHALL THE CONTRACTOR PLACE, OR CAUSE TO BE PLACED, ANY MATERIAL OR EQUIPMENT ETC. AT A LOCATION THAT WOULD IMPEDE OR IMPAIR ACCESS TO OR FROM THE PRESENT FACILITIES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING STRUCTURES AT THE WORK AREA FROM WEATHER AND OTHER INCLEMENT CONDITIONS. ANY DAMAGE INCURRED DUE TO FAILURE BY THE CONTRACTOR TO PROPERLY PROTECT SUCH WORK SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL DISPOSE OF ALL EXCESS MATERIAL, WASTE AND DEBRIS CAUSED BY THE NEW WORK. THIS MATERIAL SHALL BE REMOVED FROM THE PROPERTY AND TAKEN TO A LEGALLY OPERATED DISPOSAL SITE.
- CUTTING, BORING, SAWCUTTING OR DRILLING THROUGH THE NEW OR EXISTING STRUCTURAL ELEMENTS TO BE DONE ONLY WHEN SO DETAILED IN THE DRAWINGS OR ACCEPTED BY THE ARCHITECT AND STRUCTURAL ENGINEER.
- THE SEISMIC ANCHORAGE OF MECHANICAL AND ELECTRICAL EQUIPMENT SHALL CONFORM TO ASCE 7-16 SECTION 13.3.1 AND TABLE 13.6-1. ANCHORAGE DETAILS FOR ROOF/FLOOR MOUNTED EQUIPMENT SHALL BE SHOWN ON PLANS.
- ALL BRACING OF DUCTS AND PIPING SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA GUIDELINES AS APPROVED BY DSA. WHERE BRACING DETAILS ARE NOT SHOWN ON DRAWINGS OR IN THE GUIDELINES, THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF ARCHITECT AND STRUCTURAL ENGINEER.
- FLEXIBLE DUCT SHALL BE CONSTRUCTED IN ACCORDANCE WITH 2022 CMC SECTION 602.3.1, NFPA 90A, UL 181 CLASS (MAXIMUM FLAME SPREAD EQUAL TO 25, MAXIMUM SMOKE-DENSITY DEVELOP EQUAL TO 50), R-6 RESISTANCE VALUE.
- ALL EQUIPMENT PROCURED FOR THIS PROJECT SHALL MEET THE BUY AMERICAN ACT.
- A SET OF APPROVED DRAWINGS SHALL BE MAINTAINED ON SITE AND ALL FIELD CHANGES SHALL BE RED LINED ON THE DRAWINGS. CONTRACTOR SHALL PREPARE "AS-BUILT" DRAWINGS IN ELECTRONIC (AUTOCAD) FORMAT, REFLECTING ACCURATE FIELD CONDITIONS.

SEQUENCE OF OPERATIONTHERMOSTAT:

- A. SENSORS WILL BE ADJUSTABLE FROM THE FACE OF THE SENSOR AND WILL HAVE AN ADJUSTABLE RANGE OF ± 3 DEGREES F.

ROOT TOP UNITS:

- A. ROOF TOP UNITS SHALL BE PROVIDED WITH 7-DAY PROGRAMMABLE THERMOSTAT / TEMPERATURE SENSOR, PRESET TEMPERATURE SENSOR @ 75F (ADJUSTABLE) COOLING, 68F (ADJUSTABLE) HEATING, MOTORZED OUTSIDE AIR DAMPERS SHALL BE INTERLOCKED TO OPEN DURING OCCUPIED TIMES. RTUS SHALL COME WITH BACKNET CARD TO INTERFACE WITH THE TENANTS CONTROL SYSTEM.

MECHANICAL SPECIFICATIONS - GENERAL CONDITIONS

A. GENERAL

1. EXCEPT AS SPECIFIED TO THE CONTRARY, THIS CONTRACT SHALL INCLUDE FURNISHING, INSTALLING, CONNECTING, AND OPERATION OF ALL EQUIPMENT WHICH IS PART OF MECHANICAL SYSTEMS.

2. GENERAL AND SPECIAL CONDITIONS OF AIA (AMERICAN INSTITUTE OF ARCHITECTS) AND OWNER'S GENERAL REQUIREMENTS SHALL APPLY UNLESS NOTED OTHERWISE.

3. THE REQUIREMENTS SET FORTH UNDER "GENERAL CONDITIONS", "MODIFICATIONS TO GENERAL CONDITIONS" AND "SPECIAL CONDITIONS" ARE A PART OF THIS CONTRACT.

4. ALL MOTORS FOR SUCH EQUIPMENT (IF AND WHERE SPECIFIED ON DRAWINGS) SHALL BE FURNISHED AND INSTALLED AS PART OF THIS CONTRACT. CONTROLS FOR SUCH MOTORS SHALL BE FURNISHED UNDER THIS CONTRACT AND INSTALLATION OF CONTROLS AND ALL ELECTRICAL WIRING, NOT SHOWN ON ELECTRICAL DRAWINGS, SHALL BE PERFORMED UNDER THIS CONTRACT.

B. SUBSTITUTIONS AND MISCELLANEOUS EQUIPMENT

1. THE BIDDING OF THIS WORK WILL CONTEMPLATE THE USE OF EQUIPMENT AND MATERIALS EXACTLY AS SPECIFIED HEREIN, WHERE ONE OR MORE NAMES OF MANUFACTURERS ARE MENTIONED ANY ONE MAY BE UTILIZED.

2. ALTERNATE EQUIPMENT MAY BE BID AS A SUBSTITUTION TO THAT SPECIFIED WITH THE APPROPRIATE DEDUCT NOTED; HOWEVER, THE EQUIPMENT SUBSTITUTED SHALL MEET ALL SPECIFICATIONS IN DESIGN AND BE SUBJECT TO OWNER AND/OR ENGINEER APPROVAL. ANY ADDITIONAL COST INCURRED DUE TO SUBSTITUTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO EXPENSE TO THE OWNER.

3. MISCELLANEOUS ITEMS NECESSARY TO COMPLETE THE PIPING SYSTEMS SUCH AS FITTING, HANGERS, ETC., CAN BE OF ANY RECOGNIZED MANUFACTURER PROVIDED THESE ITEMS MEET MINIMUM STANDARDS AS SET BY THE ENGINEER.

C. ORDINANCES, PERMITS, AND CERTIFICATES AND OWNER REQUIREMENTS

1. ALL WORK UNDER THIS CONTRACT SHALL BE INSTALLED IN FULL ACCORDANCE WITH ALL CODES, LAWS, ORDINANCES AND ALL REGULATIONS OF THE STATE, COUNTY, AND MUNICIPALITY WHICH IN ANY WAY AFFECTS THIS WORK. THIS CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND CERTIFICATES OF INSPECTION REQUIRED BY THE FOREGOING GOVERNMENTAL AUTHORITIES. ALL WORK SHALL ALSO BE INSTALLED IN ACCORDANCE WITH REGULATIONS OF THE FIRE UNDERWRITERS HAVING JURISDICTION AND LOCAL UTILITIES. CONTRACTOR SHALL ALSO SECURE ANY PERMITS OR PAY ANY FEES TO THE LOCAL UTILITY COMPANIES FOR THE WORK REQUIRED.

D. DRAWINGS

1. MECHANICAL DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO SHOW THE APPROXIMATE LOCATION OF OUTLETS, EQUIPMENT AND PIPING.

2. THE EXACT LOCATION OF OUTLETS, EQUIPMENT AND PIPING MAY BE CHANGED FROM TIME TO TIME AS WORK PROGRESSES. UNDER THIS CONTRACT ALL LOCATIONS SHALL BE VERIFIED WITH ALL TRADES AND THAT THEY ARE ACCORDING TO THE LATEST INFORMATION AVAILABLE. SHOULD THIS NOT BE DONE, THE WORK WILL BE CHANGED AT NO ADDITIONAL EXPENSE TO THE OWNER.

3. THE OWNER RESERVES THE RIGHT TO MAKE MINOR CHANGES IN LOCATIONS OF EQUIPMENT OR PIPING ARRANGEMENTS UP TO THE TIME OF ROUGH-IN WITHOUT ADDITIONAL COSTS.

4. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER AND ANY MATERIALS OR LABOR CALLED FOR IN ONE SHALL BE FURNISHED EVEN THOUGH NOT MENTIONED IN BOTH. ANY MATERIAL OR LABOR WHICH IS NEITHER SHOWN ON THE DRAWINGS NOR CALLED FOR IN THE SPECIFICATIONS BUT WHICH IS OBVIOUSLY NECESSARY TO COMPLETE THE WORK AND WHICH IS USUALLY INCLUDED IN WORK OF A SIMILAR CHARACTER SHALL BE FURNISHED UNDER THIS CONTRACT.

5. ALL MODIFICATIONS REQUIRED FOR SELECTION OF EQUIPMENT WHICH IS NOT THE BASIS OF DESIGN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER. ANY REDESIGN OF SYSTEMS BASED ON CHANGES FROM BASIS OF DESIGN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

6. ALL EXISTING UTILITY AND MECHANICAL SERVICES SHALL BE FIELD VERIFIED. CORRECTIONS TO THE DESIGN AND INSTALLATION SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER.

E. SHOP DRAWINGS AND SUBMITTALS

1. AS PART OF THE WORK INCLUDED UNDER EACH MECHANICAL SECTIONS, WITHOUT CAUSING ANY DELAY IN WORK, SHOP DRAWINGS AND SUBMITTALS OF ALL EQUIPMENT AND MATERIAL SHALL BE SUBMITTED FOR ENGINEER'S REVIEW.

2. ITEMS:

- 2.1. EXHAUST FANS
2.2. DIFFUSERS, GRILLES AND LOUVERS
2.3. ROOF TOP UNITS
2.4. KITCHEN HOODS
2.5. MAKEUP AIR UNIT
2.6. GREASE EXHAUST FANS

3. SUBMITTAL SHALL INCLUDE WIRING DIAGRAMS, PERFORMANCE CURVES AND DATA SPECIFIC TO THIS PROJECT AND BEAR CONTRACTOR'S APPROVAL STAMP CERTIFYING THAT HE HAS VERIFIED CONFORMANCE TO THE CONTRACTUAL DOCUMENTS.

4. THE ENGINEER'S REVIEW OF SHOP DRAWINGS AND SUBMITTALS IS FOR CONFORMANCE WITH THE GENERAL DESIGN CONCEPT AND ARRANGEMENT ONLY. COMMENTS, CORRECTIONS OR MARKINGS DO NOT CONSTITUTE WAIVER OF THE CONTRACT DOCUMENTS REQUIREMENTS, DIMENSIONS, QUANTITIES AND COORDINATION ARE THE RESPONSIBILITY OF THE CONTRACTOR.

F. CLEANING UP

1. UNLESS OTHERWISE NOTED, ALL EXCESS MATERIALS AND DEBRIS CAUSED BY THIS WORK SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND PROMPTLY BE REMOVED FROM THE SITE. ALL FIXTURES AND EQUIPMENT INSTALLED SHALL BE THOROUGHLY CLEANED WEEKLY. ALL MOTORS AND EQUIPMENT SHALL BE COVERED OR OTHERWISE PROTECTED FROM CONSTRUCTION DUST AND DEBRIS. NO EQUIPMENT, OTHER THAN THOSE DESIGNED TO, SHALL BE EXPOSED TO INCLEMENT WEATHER.

G. CUTTING AND PATCHING

1. CUTTING FOR OPENINGS, WHEN NECESSARY, SHALL BE DONE BY THIS CONTRACTOR WITH SUCH TOOLS AND METHODS AS TO PREVENT UNNECESSARY DAMAGE TO SURROUNDING AREAS OR EQUIPMENT.

2. FILL SPACE IN ALL AREAS WITH PACKING WHERE REQUIRED TO MAINTAIN FIRE RATING. OPENINGS SHALL BE TEMPORARILY FIRE STOPPED UNTIL PERMANENT FIRE STOPPING IS DONE. THIS INCLUDES HOLES LEFT DUE TO REMOVAL OF PIPING.

3. PATCHING SHALL MATCH EXISTING SURFACES IN KIND AND FINISH, AND SHALL BE DONE BY THE GENERAL CONTRACTOR.

4. NO STRUCTURAL MEMBER WILL BE CUT INTO WITHOUT THE EXPRESSED PERMISSION OF THE OWNER'S REPRESENTATIVE.

H. FIRESTOPPING

1. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR FIRESTOPPING AROUND ALL OPENINGS FOR PIPES, DUCTS, CONDUITS ETC., INSTALLED IN FIRE WALLS AND SMOKE WALLS. FIRESTOPPING SHALL BE PERFORMED BY AN INSTALLER WHO HAS BEEN TRAINED BY MANUFACTURER, OR MANUFACTURER'S REPRESENTATIVE, IN THE INSTALLATION PROCEDURES BASED ON PUBLISHED UL TESTED FIRE STOP SYSTEMS.

2. FIRESTOPPING SHALL MEET THE REQUIREMENTS OF ASTM E-814 OR UL 1479 FIRE TESTS BY RECOGNIZED TESTING AGENCY. FIRESTOPPING SHALL ALSO CONFORM BY THE FOLLOWING GOVERNING CODES: INDIANA BUILDING CODE, NFPA 101-LIFE SAFETY CODE & NFPA 70-NATIONAL ELECTRIC CODE.

3. PENETRATIONS

- 3.1. CLEAN PENETRATION HOLES OF DIRT, LOOSE MATERIALS, AND FOREIGN MATTER WHICH MAY AFFECT BOND OR INSTALLATION.

- 3.2. REMOVE COATINGS SUCH AS PAINT, CURING COMPOUNDS, WATER REPELLENT, SEALERS AS REQUIRED.

- 3.3. INSTALL BACKING MATERIALS TO PREVENT LIQUID MATERIAL LEAKAGE.

4. APPLICATION

- 4.1. PREPARE AND APPLY PENETRATION SEALING SYSTEMS IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTRUCTIONS.

- 4.2. EMPLOY INSTALLATION TECHNIQUES WHICH WILL ENSURE THAT FIRESTOPPING IS DEPOSITED TO FILL AND SEAL HOLES AND OPENINGS.

- 4.3. TOOL EXPOSED SURFACES OF APPLIED SEALANT TO SMOOTH FINISH.

- 4.4. PROTECT MATERIALS FROM DAMAGE ON SURFACES SUBJECTED TO TRAFFIC.

- 4.5. FIRESTOPPING BY DOW CORNING, 3M, HILTI OR METACAULK MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.

I. GUARANTEE

1. ALL LABOR AND MATERIALS FURNISHED UNDER THIS CONTACT SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER WHICH WILL COMMENCE UPON THE FINAL INSPECTION BY THE ENGINEER DURING THIS TIME. ALL LEAKS, CORRECTION OF ALL THE FAILURES TO SUCH MATERIAL AND THE CORRECTION OF ALL DISCREPANCIES WITH DRAWINGS, CODES, AND THE SPECIFICATIONS SHALL BE COMPLETED UNDER THIS CONTRACT AT NO ADDITIONAL EXPENSE TO THE OWNER.

II. HVAC

A. HVAC INSULATION

1. COVER MEDIUM AND LOW PRESSURE SUPPLY DUCTWORK IN ONLY CONCEALED AREAS AS FOLLOWS:

- 1.1. ALL DUCTS SHALL BE INSULATED WITH 1-1/2" THICK, 1.5 LB DENSITY BLANKET FLEXIBLE DUCT INSULATION.

- 1.2. SEAL ALL BREAKS AND JOINTS IN VAPOR BARRIER WITH 2-1/2" WIDE PRESSURE SENSITIVE TAPE TO MATCH VAPOR BARRIER FACING. ADHERE WITH FOSTER 85-20 ADHESIVE WHERE NECESSARY.

2. COVER THE TOP OF ALL SUPPLY DIFFUSERS ABOVE CEILINGS WHEN NOT IN A RETURN AIR PLENUM. INSULATION TO BE 1 1/2" THICK, 1.5 LB DENSITY FLEXIBLE BLANKET.

3. ALL DUCT INSULATION TO BE CONTINUOUS THROUGH WALLS AND PIPE HANGERS.

4. ALL INSULATION ABOVE SHALL BE BY JOHNS-MANVILLE OR EQUIVALENT TYPE THICKNESS AND CONDUCTIVITY. INSULATION BY OWENS CORNING, KNAUF, OR CERTAINTED MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.

B. HVAC PIPING SYSTEMS

1. CONDENSATE DRAIN PIPING

- 1.1. PIPING SHALL BE SCHEDULE 40 PVC. SLOPE PIPING A MINIMUM OF 1" IN 30 FEET. PROVIDE TRAP AT EQUIPMENT CONNECTION, SIZED PER MANUFACTURERS REQUIREMENTS. INSULATE.

C. LOW PRESSURE DUCTWORK AND ACCESSORIES

1. DUCTWORK AND ACCESSORIES SHALL BE FABRICATED AND INSTALLED IN STRICT ACCORDANCE WITH THE 3" W.G. TABLE (POSITIVE FOR SUPPLY AND NEGATIVE FOR RETURN AND EXHAUST DUCTS) IN THE LATEST EDITION OF SMACNA EXCEPT AS HEREIN NOTED AND/OR AS DETAILED ON THE DRAWINGS.

2. FIBERGLASS DUCT BOARD SHALL NOT BE UTILIZED. DUCTWORK, PLENUM, ETC. SHALL BE CONSTRUCTED OF SHEET METAL.

3. FLEXIBLE CONNECTIONS TO ALL EQUIPMENT SHALL BE MADE WITH 3" WIDE DOUBLE NEOPRENE COATED FLAME RETARDANT FIBER GLASS FLEXIBLE CONNECTION. FLEXIBLE TO HAVE A MINIMUM OF 24-GAUGE, 3" WIDE SHEET METAL COLLARS PERMANENTLY ATTACHED TO EACH SIDE.

4. CHANGES IN DUCT SIZES SHALL BE MADE BY UNIFORM TAPER SECTION WITH A MAXIMUM INCLUDED ANGLE OF DIVERGENCE OF 15°.

5. SPLITTER DAMPERS SHALL NOT BE PERMITTED UNLESS SPECIFICALLY NOTED ON THE DRAWING.

E. DUCT LINER

1. WHERE DOUBLE-WALL DUCTWORK IS SHOWN ON PLANS, SUPPLY AND RETURN AIR DUCTS SHALL BE LINED WITH 1" THICK, 1.5 # DENSITY FLEXIBLE THERMAL AND ACOUSTICAL INSULATION. SURFACE FACING AIR STREAM SHALL HAVE FACTORY COATING. ALL EXPOSED LEADING EDGES AT JOINT CONNECTIONS SHALL HAVE NOSING OR ADDITIONAL SEALER APPLIED. ANCHORS AND WASHERS SHALL HAVE NON-CORROSIVE COATING. DUCT INSULATION FASTENERS SHALL BE METAL SPINDLE. SPINDLES SHALL BE SPOT WELDED TO DUCTWORK. DOUBLE WALL INSULATION DUCT MAY BE USED INSTEAD OF LINED DUCTWORK.

2. PROVIDE INSULATION MANUFACTURED BY OWENS-CORNING, KNAUF, OR JOHNS-MANVILLE.

F. DOUBLE-WALL RECTANGULAR DUCTS AND FITTINGS

1. RECTANGULAR DUCTS: FABRICATE DUCTS INDICATED DIMENSIONS FOR THE OUTER LINER.

2. OUTER DUCT: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.

3. TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-1, "RECTANGULAR DUCT/ TRANSVERSE JOINTS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

4. LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-2, "RECTANGULAR DUCT/ LONGITUDINAL SEAMS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

5. INTERSTITIAL INSULATION: FLEXIBLE ELASTOMERIC DUCT LINER COMPLYING WITH ASTM C 534, TYPE II FOR SHEET MATERIALS, AND WITH NFPA 90A OR NFPA 90B.

6. INNER DUCT: MINIMUM 0.028-INCH PERFORATED GALVANIZED SHEET STEEL HAVING 3/32-INCH DIAMETER PERFORATIONS, WITH OVERALL OPEN AREA OF 23 PERCENT.

7. FORMED-ON TRANSVERSE JOINTS (FLANGES): SELECT JOINT TYPES AND FABRICATED ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-1, "RECTANGULAR DUCT/ TRAVERSE JOINTS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

G. ACCESS DOORS

1. ACCESS DOORS SHALL BE INSULATED, AIRTIGHT, "HINGED" AND GASKETED STYLE, WITH A MINIMUM OF TWO QUICK ACTION LATCHES. DOOR SHALL BE MOUNTED IN A GALVANIZED STEEL FRAME WITH AN INSIDE "FOLD-OVER" FLANGE FOR DUCT ATTACHMENT. DOOR HEIGHT SHALL BE 24"; WIDTH SHALL BE EQUAL TO THE DUCT WIDTH OR 12" WHICHEVER IS LESS, UNLESS OTHERWISE SHOWN OR NOTED ON DRAWINGS.

H. MANUAL BALANCE DAMPERS

1. BASED ON AMERICAN WARMING TYPE VC-2 OPPOSED BLADE WITH HEAVY DUTY MOLDED NYLON BEARINGS, 16 GAUGE GALVANIZED STEEL BLADES (8" MAX. WIDTH), EXTENDED SHAFT AND LINKAGE.

2. BALANCE DAMPERS FOR ROUND DUCTS SHALL BE AMERICAN WARMING TYPE VC-9 SINGLE BLADE, 22 GAUGE (4" TO 12"), 20 GAUGE (13" TO 18") AND 18 GAUGE (19" TO 24") GALVANIZED STEEL.

3. ALL DAMPERS SHALL BE EQUIPPED WITH LOCKING QUADRANTS.

4. AT THE CONTRACTOR'S OPTION, MANUAL BALANCING DAMPERS SHALL BE MANUFACTURED BY THE CONTRACTOR PER SMACNA STANDARDS.

DAMPERS SHALL HAVE LOCKING QUADRANTS ON BOTH SIDES OF THE DUCT.

5. DAMPERS BY RUSKIN, AIR BALANCE, GREENHECK OR VENT PRODUCTS OF THE SAME TYPE AND MEETING SPECIFIED REQUIREMENTS, MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.

J. DIFFUSERS GRILLES, AND REGISTERS

1. REFER TO DRAWINGS FOR BASIS OF DESIGN.

2. AIR DEVICES BY TITUS, PRICE, ANEMOSTAT, KRUEGER, OR TUTTLE-BAILEY, MEETING ALL SPECIFIED REQUIREMENTS MAY BE FURNISHED AT CONTRACTORS OPTION.

K. TESTS AND ADJUSTMENTS

1. CONTRACTOR SHALL ARRANGE AND PAY FOR A CERTIFIED (AABC, NEBB, OR TAB) TEST AND AIR BALANCE FOR THE PROJECT, WITHIN TWO WEEKS AFTER COMPLETION OF THE CONSTRUCTION. A CERTIFIED AIR BALANCE REPORT SHALL BE SUBMITTED TO THE OWNER FOR REVIEW AND APPROVAL. IN THE EVENT THAT THE OWNER REQUIRED ADJUSTMENTS TO OWNER'S AIR DISTRIBUTION, CONTRACTOR SHALL PAY ALL COSTS RELATED THERE.

III. HVAC EQUIPMENT

A. CONTROLS

1. THIS CONTRACT SHALL INCLUDE ALL LINE, LOW VOLTAGE CONTROL WIRING AND INTERLOCK WIRING TO OPERATE HEATING, VENTILATING AND AIR CONDITIONING EQUIPMENT INSTALLED UNDER THIS CONTRACT. ALL WIRING TO COMPLY WITH ELECTRICAL SPECIFICATIONS. CONTRACTOR SHALL COORDINATE WITH OWNER AND GENERAL CONTRACTOR.

2. CONTRACTOR SHALL COMPLETE TRAINING ON ALL CONTROLS TO OWNER. DURING TRAINING, CONTRACTOR SHALL WORK WITH OWNER REPRESENTATIVE TO ADJUST DAILY, WEEKLY, AND CALENDAR SCHEDULES INCLUDING HOLIDAYS, WEEKEND AND AFTER HOURS UNOCCUPIED SETBACK TEMPERATURES MAY BE ADJUSTED TO ALLOW FOR QUICKER "OCCUPIED" TEMPERATURE WHEN OVERRIDE BUTTONS ARE ENABLED AT SENSORS.

3. PROVIDE CONTROLS, REQUIRED TO INTERFACE EXHAUST FANS AND ROOF TOP UNITS. SEE SCHEDULES AND SEQUENCE FOR MORE INFORMATION.



GENERAL NOTES

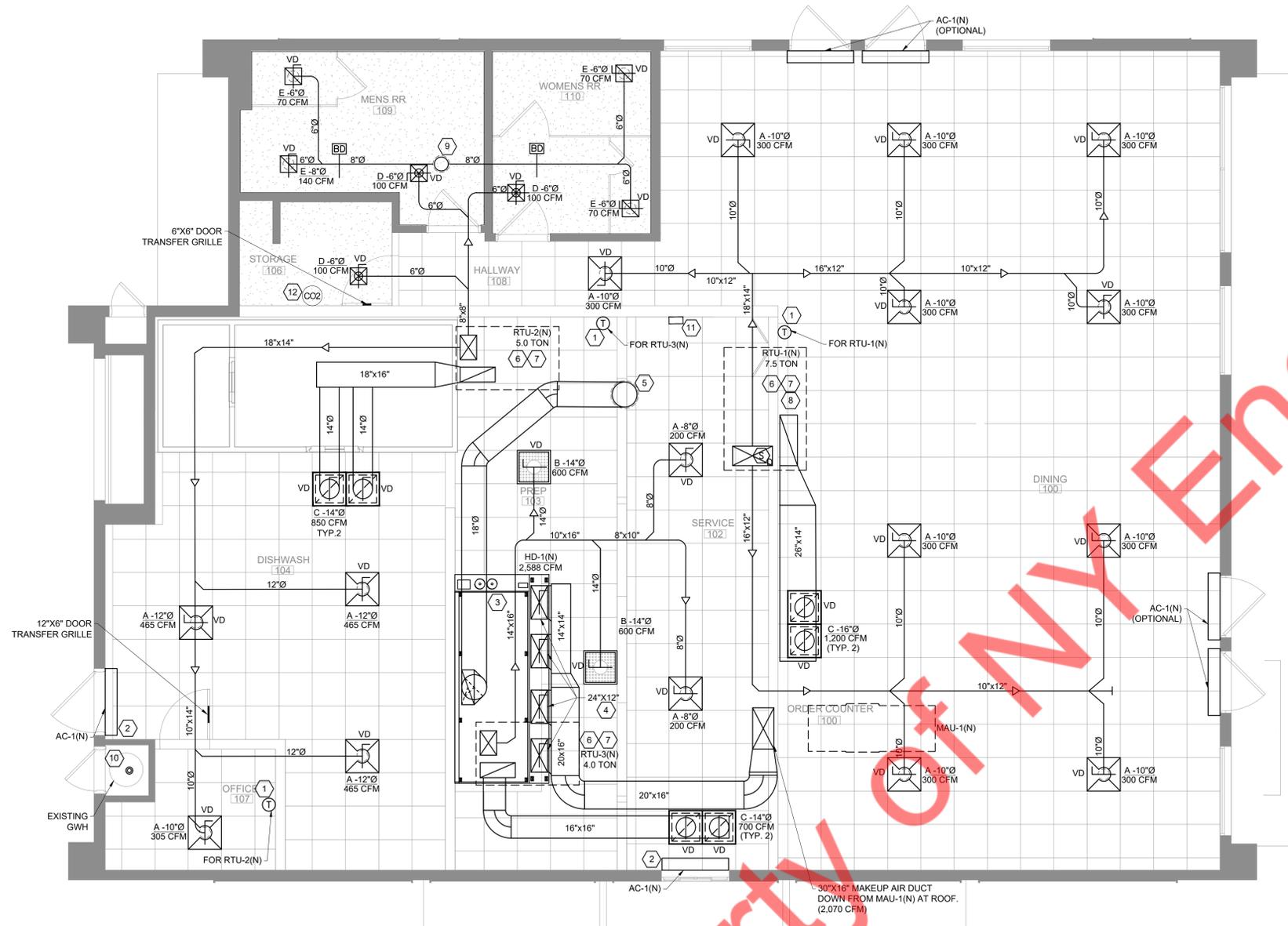
- A. PROVIDE ALL NEW DUCTWORK AS SHOWN. DUCT WORK ABOVE CEILING TO BE INSULATED ACCORDING TO CALIFORNIA ENERGY CODE 2022.
- B. FLEXIBLE AIR CONNECTORS SHALL BE TESTED IN ACCORDANCE WITH UL 181. SUCH DUCTS SHALL BE LISTED AND LABELED AS CLASS 0 OR CLASS 1 FLEXIBLE AIR CONNECTORS. FLEXIBLE AIR CONNECTORS SHALL BE LIMITED IN LENGTH TO 14 FEET.
- C. TEST & BALANCE SYSTEM PRIOR TO CLOSEOUT OF PROJECT. PROVIDE A DETAILED REPORT TO OWNER, ARCHITECT, & ENGINEER.
- D. ALL DUCTWORK SHALL BE FABRICATED, INSTALLED, SEALED, AND INSULATED PER THE LATEST ISSUE OF SMACNA LOW-VELOCITY DUCT MANUAL.
- E. DUCT SIZES SHOWN ON DRAWINGS ARE CLEAR INSIDE DIMENSION.
- F. THE CONTRACTOR SHALL VERIFY EXACT LOCATION OF TRUSSES AND MODIFY DUCTWORK ACCORDINGLY.
- G. PROVIDE FIRE OR FIRE-SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/BARRIERS/SLABS. COORDINATE WITH ARCHITECTURAL DRAWING FOR FIRE RATING OF THE WALLS.
- H. DUCT TO EXHAUST FAN CONNECTIONS SHALL BE FLANGED, GASKETED AND BOLTED TO THE INLET OF THE FAN FOR SIDE-INLET UTILITY FANS. APPROVED FLEXIBLE CONNECTIONS MAY BE PROVIDED.
- I. ALL WORK SHALL BE SUBJECT TO THE ACCEPTANCE AND APPROVAL OF THE ARCHITECT AND OWNER. THE ARCHITECT SHALL BE NOTIFIED OF ANY AND ALL DISCREPANCIES BETWEEN FIELD CONDITIONS AND THE CONTRACT DOCUMENTS BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. FAILURE OF PROPER NOTIFICATION DOES NOT RELIEVE THE CONTRACTOR. THE CONTRACTOR SHALL CORRECT ANY AND ALL WORK ARISING FROM SUCH FAILURE TO COORDINATE DISCREPANCIES TO THE SATISFACTION OF THE ARCHITECT WITHOUT ADDITIONAL COST TO THE OWNER.
- J. THE CONTRACTOR SHALL, UPON COMPLETION OF PROJECT, PERFORM A COMPLETE TEST AND BALANCE OF ALL EQUIPMENT. PROVIDE A WRITTEN REPORT TO THE ARCHITECT. ALL CAPACITIES MUST BE SET TO WITHIN ±10% OF AMOUNTS INDICATED ON THE FLOOR PLAN AND SCHEDULES.
- K. PROVIDE CORD OPERATED DAMPERS FOR AIR TERMINALS MOUNTED IN INACCESSIBLE CEILINGS.

KEY NOTES

- 1. PROVIDE NEW 7-DAY PROGRAMMABLE THERMOSTAT WITH LOCKING COVER. LOCATE THERMOSTAT IN MANAGER'S OFFICE. PROVIDE REMOTE SENSOR LOCATED 48" A.F.F. NEAR LOCATION INDICATED. COORDINATE LOCATION ON SITE WITH GENERAL CONTRACTOR AND EQUIPMENT. AVOID LOCATING NEAR OR ABOVE SOURCES OF HEAT. INTERLOCK WITH ASSOCIATED RTU.
- 2. FURNISH AND INSTALL AIR CURTAIN AS SCHEDULED ABOVE DOOR. UNIT TO BE INSTALLED TO ACCOMMODATE MANUFACTURER'S RECOMMENDED SERVICE AND OPERATION CLEARANCE REQUIREMENTS.
- 3. FURNISH & INSTALL TYPE 1 KITCHEN EXHAUST HOOD W/ PRE-PIPED FIRE SUPPRESSION SYSTEM. REFER SHEET M5.1 & M5.2 FOR KITCHEN HOOD SCHEDULE AND INFORMATION.
- 4. 24"x12" MAKE-UP AIR DUCT CONNECTION TO HOOD. PROVIDE VOLUME DAMPER AND BALANCE TO 518 CFM.
- 5. 18"Ø EXHAUST AIR DUCT FROM KITCHEN HOOD UP TO THE ROOF AND CONNECT TO KEF-(N).
- 6. EXTEND FULL SIZE SUPPLY & RETURN DUCTWORK FROM ROOFTOP UNITS TO SPACE. EXTEND AS SHOWN. TRANSITION DUCT AS NECESSARY TO MAKE CONNECTION. ACOUSTICALLY LINE THE FIRST 10'-0" OF BOTH SUPPLY AND RETURN MAIN DUCTS.
- 7. CONTRACTOR TO PROVIDE REMOTE TEMPERATURE SENSOR IN RETURN AIR PATH & WIRE BACK TO RTU-1(N), RTU-2(N) & RTU-3(N).
- 8. DUCT MOUNTED SMOKE DETECTOR SHALL BE FURNISHED/INSTALLED BY MECHANICAL CONTRACTOR AND WIRED BY ELECTRICAL CONTRACTOR TO SHUT DOWN CORRESPONDING RTU UNDER ALARM CONDITIONS. ALL WIRING SHALL BE IN CONDUIT PER N E C SMOKE DETECTOR SHALL BE SYSTEM SENSOR MODEL DH100ACDCLP OR EQUAL.
- 9. 10"Ø TOILET EXHAUST DUCT GOING UP THROUGH ROOF & CONNECT TO EF-1(N).
- 10. EXISTING WATER HEATERS FLUE VENTS TO REMAIN. CONTRACTOR TO FIELD VERIFY LOCATION AND CONDITION OF EXISTING VENTS. PROVIDE NEW VENTS IF REQUIRED AS PER MANUFACTURER'S RECOMMENDATION.
- 11. PROVIDE AND INSTALL EMERGENCY MANUAL SHUTDOWN PUSH BUTTON FOR HOOD. PUSH BUTTON SHALL BE IN THE PATH OF EGRESS, A MINIMUM OF 10' AWAY FROM THE HOOD AND A MAXIMUM OF 20'.
- 12. PROVIDE CO2 SENSOR/MONITOR. MOUNT 12" A.F.F. AND WITHIN 15 FT OF CO2 TANKS. SENSOR SHALL BE A LOGICO2 MK10 ALL IN ONE SENSOR, OR LOGICO2 MK9 IF CENTRAL SYSTEM IS REQUIRED. PROVIDE REMOTE STROBE AND ALARM.

KITCHEN EXHAUST NOTES

- 1. ALL TYPE I GREASE DUCT SHALL BE WRAPPED WITH TWO LAYERS OF 3M™ FIRE BARRIER DUCT WRAP 615+ DUCT ENCLOSURE SYSTEM PROVIDING 2-HOUR FIRE RESISTANT PROTECTION. WRAP SHALL CONSIST OF 3" PERIMETER AND LONGITUDINAL OVERLAPS WITH ZERO CLEARANCE TO COMBUSTIBLES. DUCT WRAP SHALL COMPLY WITH THE REQUIREMENTS OF NFPA 96 AND ICC-ES EVALUATION REPORT NO. ESR-1255. DUCT WRAP IS UL LISTED. DUCT WRAP SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 2. MATERIAL - STEEL NOT LESS THAN 0.055 INCH (NO. 16 GAGE) IN THICKNESS, WITH JOINTS AND SEAMS MADE WITH A CONTINUOUS LIQUID-TIGHT WELD MADE ON THE EXTERNAL SURFACE OF THE DUCT SYSTEM.
- 3. ALL TURNS IN KITCHEN EXHAUST DUCT SHALL BE ACHIEVED WITH THE USE OF A 1.5 RADIUS/WIDTH SMOOTH RADIUS ELBOW. REFERENCE DETAILS.
- 4. HORIZONTAL DUCT SERVING TYPE I HOODS SHALL BE SLOPED NOT LESS THAN 2% TOWARD HOOD.
- 5. A PERFORMANCE TEST SHALL BE CONDUCTED UPON COMPLETION AND BEFORE FINAL APPROVAL OF THE INSTALLATION OF A VENTILATION SYSTEM SERVING COMMERCIAL COOKING APPLIANCES. THE TEST SHALL VERIFY THE RATE OF EXHAUST AIRFLOW, MAKEUP AIRFLOW, AND PROPER OPERATION AS SPECIFIED IN THE MECHANICAL CODE (INCLUDING CAPTURE AND CONTAINMENT TEST). THE PERMIT HOLDER SHALL FURNISH THE NECESSARY TEST EQUIPMENT AND DEVICES REQUIRED TO PERFORM THE TESTS. COORDINATE ALL TESTS WITH AHJ, INCLUDING FINAL REPORT/SUBMITTAL AND WITNESS REQUIREMENTS.
- 6. SLOPE ALL HORIZONTAL GREASE DUCT 1" PER FOOT WHERE SPACE ALLOWS, BUT NOT LESS THAN 1/4" PER FOOT AS REQUIRED BY AHJ.
- 7. CONTRACTOR TO PROVIDE AND INSTALL ALL CODE REQUIRED FIRE RATED ACCESS DOORS IN GREASE DUCTS AT ALL LOCATIONS REQUIRED BY CODE AND LOCAL AUTHORITY HAVING JURISDICTION.
- 8. PROVIDE CLEANOUTS IN ALL KITCHEN EXHAUST DUCTWORK AT EVERY CHANGE OF DIRECTION AND AT EVERY 12' OF DUCT. PROVIDE ACCESS PANELS AT ALL GREASE DUCT CLEANOUTS. PROVIDE AS PER LOCAL CODE.
- 9. COORDINATE HOOD INSTALLATION WITH HOOD PLANS. HOOD OPERATION, CAPTURE, SIZE AND ACCESSORIES ARE BASED ON EQUIPMENT AND CLEARANCES INDICATED IN PLANS. FIELD VERIFY AND COORDINATE HOODS WITH EQUIPMENT FURNISHED. COORDINATE HOOD CONNECTIONS WITH HOOD PLANS AND MANUFACTURER PRIOR TO FABRICATION.
- 10. COORDINATE INTERLOCKS AND HOOD CONTROLS WITH HOOD PLANS AND HOOD MANUFACTURER PRIOR TO INSTALLATION.



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RECTANGULAR BRANCH TAP DETAIL

NOTES:
1. THIS CONNECTION SHALL BE TYPICAL FOR ALL RECTANGULAR BRANCH DUCT CONNECTIONS TO REGULAR TRUNK DUCTS, INCLUDING SUPPLY, RETURN, OUTSIDE AIR AND EXHAUST DUCTS.

SPIN-IN CONNECTION DETAIL

NOTES:
1. TYPICAL OF ALL ACCESSIBLE ROUND DUCT CONNECTIONS TO RECTANGULAR DUCT.

ROOF EXHAUST FAN DETAIL(DOWN BLAST)

LAY-IN TYPE CEILING DIFFUSER DETAIL

NOTES:
1. EXTEND HARD METAL DUCT SO THAT MAXIMUM FLEXIBLE DUCT LENGTH DOES NOT EXCEED 14'-0". PROVIDE RIGID 90° ELBOW WHERE REQUIRED TO KEEP FLEXIBLE DUCT WITH 14'-0" LENGTH LIMITATION.

VOLUME DAMPER - LOCK TYPE DETAIL

FIG. C ROUND DAMPER
FIG. D ELEVATION TWO BLADE ARRANGEMENT

FIG. A OR B SIDE ELEVATION

NOTE: OVER 12" HIGH USE MULTIPLE BLADES.

REQUIRED ON 3"W.G. CLASS DUCT AND OVER, OPTIONAL FOR OTHERS.

FLEXIBLE DUCT HANGER & CONNECTION DETAIL

NOTE: MAXIMUM PERMISSIBLE SAG PER FOOT 1/2" BETWEEN SUPPORTS

KITCHEN EXHAUST FAN INSTALLATION DETAIL

NOTE: INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA 96 REQUIREMENTS.
IMPORTANT NOTE: MAINTAIN AT MINIMUM 10' FROM OUTSIDE AIR INTAKES OR PROVIDE WINDRAMP EXTENSION ASSEMBLY TO DISCHARGE AT LEAST 3FT HIGHER THAN ANY OUTSIDE AIR INTAKE OPENING

ROOFTOP UNIT DETAIL

INSTALL ROOF CURB (14" MIN.) TO PROVIDE LEVEL MOUNTING SURFACE FOR ROOFTOP UNIT.

SMOKE DETECTOR BY DIV. 16 (FOR ALL AIR VOLUMES GREATER THAN 2000 CFM)

CONDENSATE CONNECTION DETAIL

4 X S.P. MINIMUM
2 X S.P. MINIMUM

DUCT PASSING THROUGH WALL DETAIL

FLEXIBLE DUCT CONNECTION DETAIL

NOTE: FLEXIBLE CONNECTION TO ISOLATE ALL DUCTS FROM ALL FANS AND FAN ENCLOSURES TO PREVENT TRANSMISSION OF VIBRATION TO DUCTWORK AND STRUCTURE.

ROOFTOP CURB DETAIL

ROOFTOP CURB DETAIL

DUCT HANGER DETAIL

HANGER SIZE @ 8' MAX. SPACING

P/D	STRAP
<30"	1" x 22 GA.
31"-72"	1" x 20 GA.
73"-96"	1" x 18 GA.
97"-120"	1" x 16 GA.
121"-192"	1-1/2" x 16 GA.

(P= PERIMETER OF DUCT)

RIGID DUCT HANGER DETAILS

TYPICAL DUCT DETAIL

NOTES:
1. PROVIDE STANDARD RADIUS ELBOWS WHEN POSSIBLE - SHORT RADIUS WHERE REQUIRED.
2. ALL SHORT RADIUS ELBOWS SHALL HAVE VANES. VANES SHALL BE CONSTRUCTED, SUPPORTED & FASTENED AS RECOMMENDED BY SMACNA.
3. NO SQUARE OR RECTANGULAR HEEL ELBOWS SHALL BE ALLOWED.

VANE SCHEDULE	NO. OF VANES
≤ 12"	1
12"-24"	2
24"-36"	3
36"-60"	4
60"-84"	5
> 84"	6

PIPE HANGER DETAIL

PIPE HANGERS AND SUPPORTS SUPPORT HORIZONTAL STEEL AND COPPER PIPING AS FOLLOWS:
NOMINAL PIPE SIZE DISTANCE BETWEEN SUPPORTS/HANGER ROD DIAMETERS

1/2"	6"	3/8"
3/4" TO 1-1/2"	6"	1/2"
2" TO 2-1/2"	10"	1/2"
3" AND 4"	10"	5/8"
6" TO 12"	14"	7/8"
14" TO 18"	20"	1"

PLACE HANGER WITHIN 1 FOOT OF EACH HORIZ. ELBOW. SUPPORT HORIZ. SOIL WASTE AND STORM PIPE NEAR EACH HUB. WITH 5 FEET MAXIMUM SPACING BETWEEN HANGERS.

VERTICAL PIPING:
1. SUPPORT VERTICAL WATER PIPING AT EVERY FLOOR.
2. SUPPORT VERTICAL SOIL PIPE AT EACH FLOOR AT HUB.

WHERE SEVERAL PIPES CAN BE INSTALLED IN PARALLEL AND AT SAME ELEVATION PROVIDE MULTIPLE OR TRAPEZE HANGERS WHERE PRACTICAL. SUPPORT RISER PIPING INDEPENDENTLY OF CONNECTED HORIZ. PIPING.

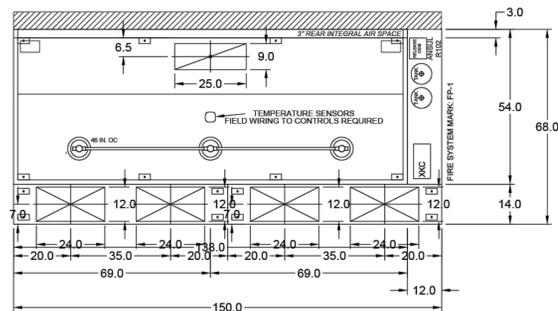


HOOD INFORMATION																	
HOOD NO.	MARK	MODEL	HOOD DIMENSIONS (IN.)			HOOD CONSTR.	COOKING LOAD / DUTY RATING	TOTAL CFM	EXHAUST COLLAR(S)					SUPPLY		TOTAL WEIGHT LBS.	SECTION LOCATION
			LENGTH	WIDTH	HEIGHT				WIDTH	LENGTH	DIA.	CFM	S.P.	MUA	AC		
1	222 - HOOD	XXEW-138-S	138	54	24	430 SS WHERE EXPOSED	HEAVY	2588	9	25		2588	0.601	2070		364.566	SINGLE

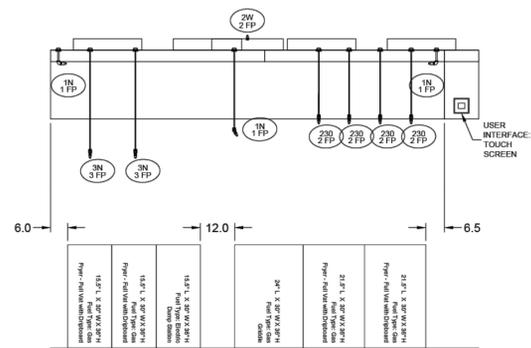
HOOD INFORMATION														
HOOD NO.	MARK	LIGHTING DETAILS				GREASE FILTRATION DETAILS				UTILITY CABINET(S)				
		FIXTURE TYPE	BULB / LAMP INFO	QTY	FOOT CANDLES	TYPE / MODEL	MATERIAL	QTY	SIZE (IN.)	LOCATION	FIRE SYSTEM	SIZE	MODEL	CONTROLS
1	222 - HOOD	ROUND LED		3	70.9	X-TRACTOR	STAINLESS STEEL	2	6 18 20	RIGHT	ANSUL R102	6	XKC	TOUCHSCREEN

SUPPLY PLENUM INFORMATION																		
HOOD NO.	MARK	POS.	TYPE	SIZE (IN.)			INSULATED	DAMPER(S)	LED LIGHT(S) SUPPLIED	QTY	TOTAL CFM	COLLARS						
				L	W	H						TYPE	MOUNTING	QTY	W	L	DIA.	CFM
1	222 - HOOD	FRONT	ASP	75	14	4	NO	YES	NO	1035	MUA	FACTORY	2	12	24	518	0.01	259
1	222 - HOOD	FRONT	ASP	75	14	4	NO	YES	NO	1035	MUA	FACTORY	2	12	24	518	0.01	259

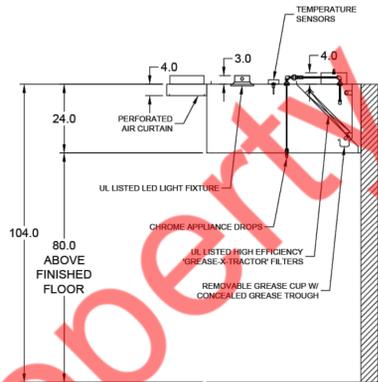
HOOD OPTIONS
 UL 710 LISTED W/ OUT EXHAUST FIRE DAMPER - UL #R25625
 BACK INTEGRAL AIR SPACE - 3 IN WIDE
 FACTORY MOUNTED EXHAUST COLLAR(S)
 PERFORMANCE ENHANCING LIP (PEL) TECHNOLOGY
 STANDING SEAM CONSTRUCTION FOR SUPERIOR STRENGTH



MARK: 222 - Hood - SECTION 1
PLAN VIEW



MARK: 222 - Hood - SECTION 1
ELEVATION VIEW



MARK: 222 - Hood
SECTION VIEW

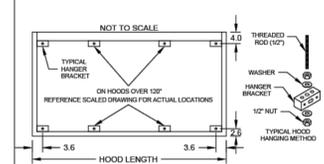
HOOD HANGING HEIGHT FOR FIRE SYSTEMS
 VERIFICATION OF HOOD HANGING HEIGHT ABOVE FINISHED FLOOR (A.F.F.) IS REQUIRED FOR CORRECT PLACEMENT OF FIRE SYSTEM NOZZLES.

- RECOMMENDED HANGING HEIGHT = 80" FROM FINISHED FLOOR TO LOWER FRONT EDGE OF HOOD.
- OTHER HANGING HEIGHT = " FROM FINISHED FLOOR TO LOWER EDGE OF HOOD.

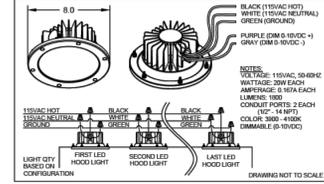
SUPPLY PLENUM HANGER BRACKET DETAIL



HOOD HANGER BRACKET DETAIL



ROUND LED LIGHT DETAIL

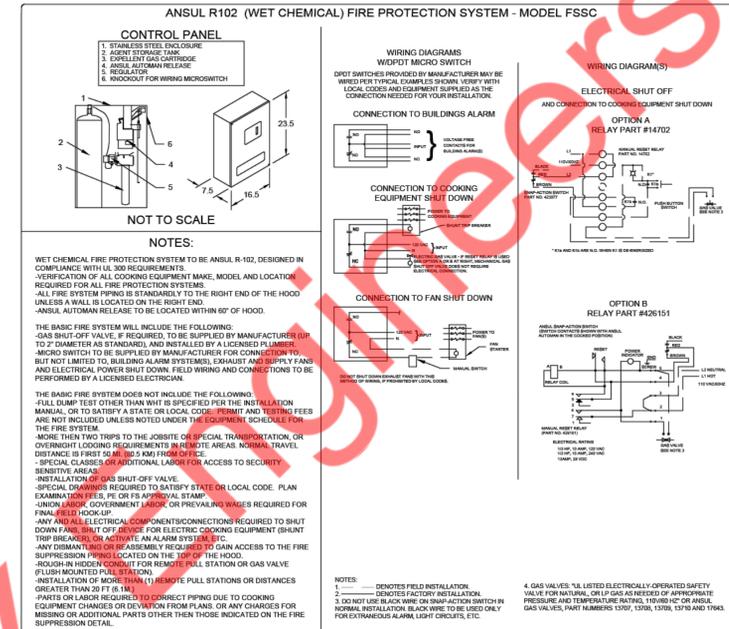


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FIRE SYSTEM INFORMATION						
MARK	MODEL	LOCATION	FLOW POINTS		SUPPLY LINE	DETECTION
			HOODS	PCU		
FP-1	ANSUL R-102 WET CHEMICAL	CABINET - RIGHT END OF 222 - HOOD	19 UTILIZED 22 AVAILABLE		CONTINUOUS	FUSIBLE LINK
						MARK(S) PROTECTED BY FIRE SYSTEM
						222 - HOOD SECTION 1

FIRE SYSTEM OPTIONS AND ACCESSORIES
 FULL INSTALLATION (INCLUDES PRE-PIPED HOOD(S) WITH DETECTION AND FACTORY COORDINATED INSTALL)
 CHROME SLEEVES FOR FACTORY PROVIDED APPLIANCES DROPS - INCLUDED
 METAL BLOW-OFF CAPS - INCLUDED
 GAS VALVE - INCLUDED - ELECTRICAL SHUTOFF VALVE, 2", 110V, 60HZ - PART# ELECTRICSHUTOFFVALVE200
 HOOD SUPPRESSION TANK - INCLUDED - 6 GAL. - [(2) 3.0 TANK(S)]
 REMOTE PULL STATION - STANDARD - FIELD INSTALLATION AT SINGLE POINT OF EGRESS

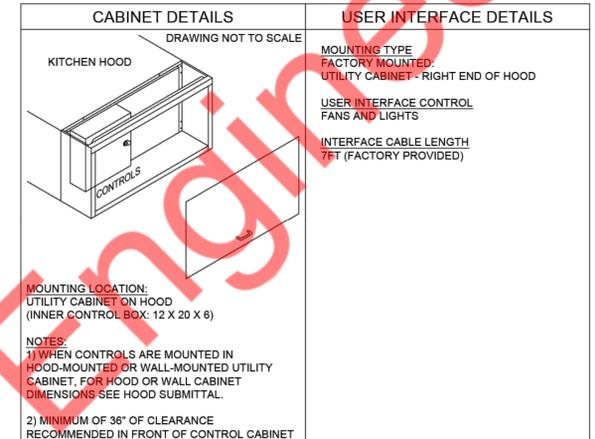


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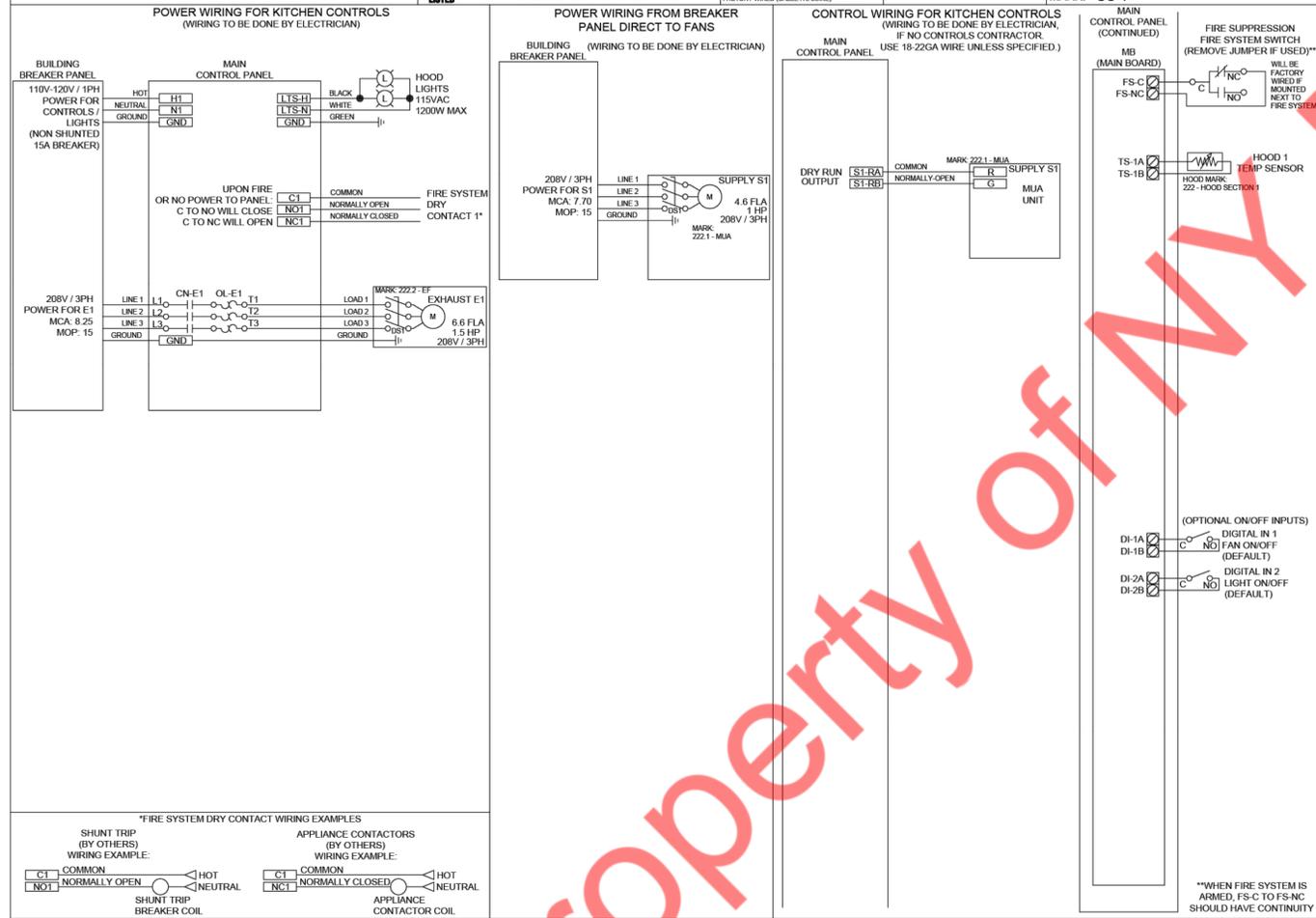


CONTROL INFORMATION		ELECTRICAL CONTROL PACKAGE		USER INTERFACE		FANS CONTROLLED										
MARK	MODEL	LOCATION	TYPE	LOCATION	FAN #	TYPE	FAN	FAN MARK	ZONE	CFM	MOTOR HP	MOTOR VOLT	CYCLE	MOTOR PHASE	MOTOR STARTER IN PANEL	VFD IN PANEL
CC-1	XKC-CV-S-11-1-1-0	RIGHT CABINET ON 222-HOOD	FULL COLOR TOUCHSCREEN	CABINET - RIGHT CABINET ON 222-HOOD	1	EXHAUST	E1	222.2 - EF	1	2588	1.5	208	60	3	YES	NO
					2	SUPPLY	S1	222.1 - MUA	1	2070	1	208	60	3	NO	NO

CONTROL FEATURES
 HOOD LIGHT CONTROL
 TEMP SENSORS (FACTORY INSTALLED) - QTY. 1
 DRY FIRE CONTACTS - QTY. 1
 LIGHTS OFF DURING FIRE
 EXHAUST MAX DURING FIRE
 SUPPLY OFF DURING FIRE



DOC NUMBER: #### REV: ####
CAUTION
 UNIT MUST BE GROUNDED IN ACCORDANCE WITH N.E.C. POWER MUST BE OFF WHILE REPAIRING.
ATTENTION
 L'APPAREIL DOIT ÊTRE MIS À LA TERRE CONFORMÉMENT AU CODE C.E. L'ALIMENTATION DOIT ÊTRE COUPÉE DURANT L'ENTRETIEN.
 COMMERCIAL APPLIANCE OUTLET CENTER
 ELECTRICAL RATINGS: 110-240V, 1PHASE, 50-60HZ, 15A
 BASE FILE #E200016, ML FILE #E313051
 THESE DRAWINGS SHALL NOT BE REMOVED FROM THIS EQUIPMENT. USE COPPER CONDUCTORS RATED TO 80°C UNLESS SPECIFIED. TORQUE CONTROLS & GROUND BOLTS TO 1/8" IN TORQUE. POWER LOGSCREWS TO COMPONENT RATINGS LISTED. RESISTANCE SHOULD NOT EXCEED 0.25 OHM PER TERMINAL TO 3.5 LBS. IN FIELD CONTROL WIRING. FOR ADDITIONAL INFORMATION, OR CALL FACTORY AT 1-800-371-8888.
 PRG VERSION: V4
 FIELD WIRING CABLE LOCALMENT: _____
 FACTORY WIRING CABLE A1 US981
 NE PAS RETIRER CES DESSINS DE CET ÉQUIPEMENT. SAUF INDICATION CONTRAIRE, UTILISER DES CONDUCTEURS EN CUIVRE CLASSÉS À 80°C. SERRER LES BORNES DE COMMANDE ET DE MISE À LA TERRE À 1/8 PO. SERRER LES COSSÉS D'ALIMENTATION AUX COUPURES INDICÉES POUR LE COMPOSANT. SERRER LES BORNES À VIS DE LA CLETTE DE COMMANDE À 3,5 LB PO. LA RÉSISTANCE DU CÂBLAGE DE COMMANDE LOCAL NE DOIT PAS DÉPASSER 0,25 OHM. POUR PLUS D'INFORMATION, CONSULTER LE MANUEL OU APPELER 1-800-371-8888.
 WIRING DIAGRAM CODE: #####
 JOB NAME: BIG CHICKEN - NORTH HOLLYWOOD - REV4
 MODEL: XKC-CV-S-11-1-1-0
 SERIAL NUMBER: WDSN#
 MARK: CC-1



WIRING DIAGRAM CODE: #####

JOB NAME: BIG CHICKEN - NORTH HOLLYWOOD - REV4
 MODEL: XKC-CV-S-11-1-1-0
 SERIAL NUMBER: WDSN#
 MARK: CC-1
 DOC NUMBER: #### REV: ####

DEFAULT SETTINGS / PARAMETRES PAR DÉFAUT
 FACTORY SETTINGS
 TYPE: CT
 CONFIGURATION: STANDARD
 ZONES: 1
 HOODS: 1
 SUMPERS: 0
 EXHAUST FANS: 1
 SUPPLY FANS: 1
 MB HOOD SENSOR: NO
 MB TEMP SENSORS: 1
 HIGH TEMP FAULT: NO
 FREEZE PROTECTION: YES
 GAS RESET: NO
 FAN PROWING: NO
 BMS: NONE

ZONE CONFIGURATION

ZONE #	ZONE	ROOM TEMP
1	Z1	PRESET

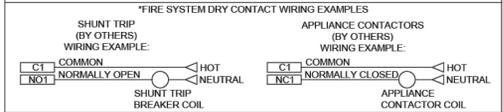
HOOD CONFIGURATION

HOOD #	HOOD	HOOD MARK	ZONE	EXHAUST	SUPPLY	MS-TEMP SENSORS	HCB
1	H1	222-HOOD SECTION 1	Z1	E1	S1	TS1	NO

FAN CONFIGURATION

FAN #	TYPE	FAN	FAN MARK	ZONE	MIN CFM	MAX CFM	MODBUS VFD	VFD ADDRESS	MIN FREQ	MAX FREQ	MIN VDC	MAX VDC
1	EXHAUST	E1	222.2 - EF	Z1	-	2588	NO	-	-	-	-	10.0
2	SUPPLY	S1	222.1 - MUA	Z1	-	2070	NO	-	-	-	-	10.0

PRG VERSION: V4



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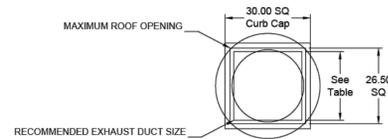
Belt Drive Upblast Centrifugal Roof Exhaust Fan

MARK INFORMATION		FAN INFORMATION					MOTOR INFORMATION						
QTY	MARK	MODEL	VOLUME (CFM)	TOTAL EXTERNAL SP (IN WG)	FAN RPM	OPERATING POWER (HP)	WEIGHT (LB.)	SIZE (HP)	V/C/P	ENCLOSURE	MOTOR RPM	WINDINGS	NEC FLA*
1	222.2 - EF	XCUBE-180HP-15	2,588	1.351	1,313	1.04	135	1.5	208/60/3	OP	1725	1	6.6

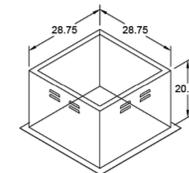
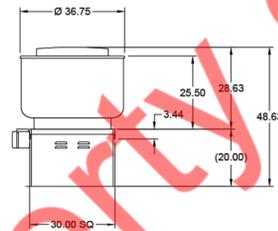
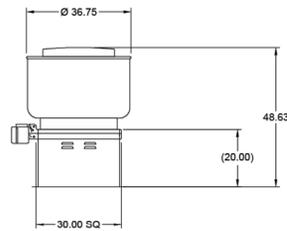
NEC FLA - Based on table 430.250 or 430.248 of National Electrical Code 2020. Actual motor FLA may vary for sizing thermal overload, consult factory

222.2 - EF : SELECTED OPTIONS AND ACCESSORIES

- One piece fully welded windband
- Tapered bushing wheel hub
- Breather tube outlet area min. 4.4 sq. in. (sizes 99-480)
- Min. windband material thickness: 0.051" aluminum (060-240), 0.064" aluminum (240HP, 240XP), 0.080" aluminum (sizes 300-480)
- Standard Curb Cap Size - 30 Square
- UL/cUL 762 Listed - "Power Ventilators for Rest. Exh. Appliances"
- Switch, NEMA-1, Toggle, Shipped with Unit
- Hinge, Factory Installed
- High Temp Curb Seal Rated for Continuous Duty at 1500 F (Factory Attached)
- Grease Trap (PN 475538)
- Heat Baffle (Attached)



DUCT TYPE	SIZE
STANDARD	24 SQ
FIRE-WRAPPED	16 SQ



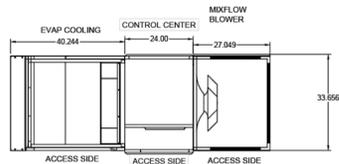
DUCT DIMENSIONS ARE LARGEST POSSIBLE DUCT TO FIT THROUGH CURB. CONSULT SYSTEM DESIGN ENGINEER FOR RECOMMENDED DUCT SIZE.

OVERALL HEIGHT MAY BE GREATER DEPENDING ON MOTOR, ADAPTER, AND/OR HINGE BASE.

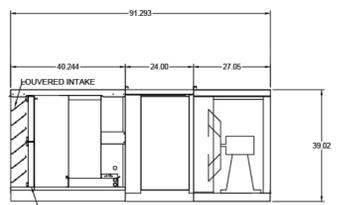
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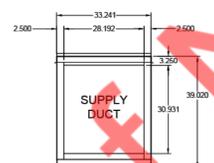
EQUIPMENT SCHEDULE										OPTIONS AND ACCESSORIES
Tempered Make-Up Air Unit										Air Flow Arrangement: Outdoor Air Only Damper: Inlet Outdoor Air Intake Position: End Discharge Position: End Coating: Galvanized Insulation: Double Wall - Entire Unit Supply Fan Control: VFD VFD Control: Constant Volume Access Side: Right Hand Control Center: Cool Inlet Air Sensor Unit Controls: Terminal Strip Temperature Control: None Terminal Strip Evap Cooling Options/Accessories Evap Media: CEL-66 Evap Control: Recirculating Pump With Covered Intake and Aluminum Mesh Filters, 14/30/2 - 2 Unit Warranty: 18 Months (std.)
Qty	Accurex Model	Volume	External SP	Total SP	MCA	MCP	Weight	SCCR	Mark: 222.1 - MUA	
1	XMEDX-P112-H12-MF	2,070 CFM	0.5 in. wg	0.749 in. wg	7.7	15	942 lb	5A		
Motor Information		Enclosure		Make with Shut Overriding		Motor RPM		Operating Power		
1 hp		208/60/3		ODP		No		1725		
Cooling		Cooling Control		Required Flow* (CFM)		Temperature Control		Terminal Strip		
Cooling Type		Cooling Media		Cooling Capacity (MBH)		Summer Bulb (F)		Filters		
Evaporative		CEL-66		27.2		63.7 F		70.2 F		
								2in. Aluminum Mesh		
								Recirculating Pump		
*Required Air and Water Pressure as per design and specification. For Air, see manufacturer's catalog for proper operation. Control capacity for actual water usage.										
Outlet Static Power By Outside Band										
62.5	125	250	500	1000	2000	4000	8000	LWA	dBA	Sound
68.1	67.1	70.3	67.8	74.3	74.2	70.6	66.9	79.2	66.2	14.8
*LWA = Leq weighted sound pressure level based on 11.0 dB A-weighting per octave band at 1 ft. *dBA = dBA-weighted sound pressure level based on 11.0 dB A-weighting per octave band at 1 ft. *Sound Power Level (SPL) based on average distance of 11.0 ft from sound source at 1 ft.										



PLAN VIEW



ELEVATION VIEW



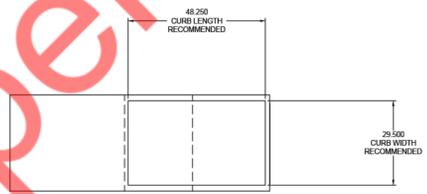
END VIEW

NOTE: Roof Opening Requirements:

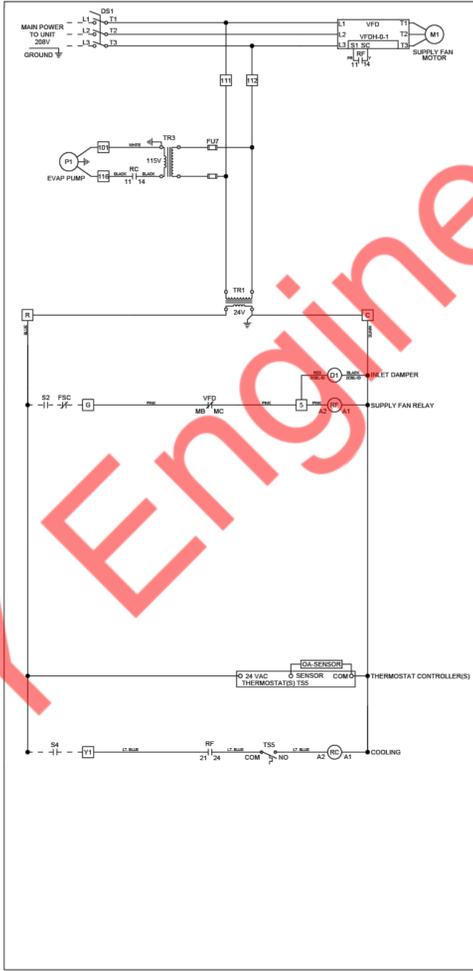
Minimum Roof Opening: The minimum roof opening size is the illustrated duct diameter plus 0.25 in. on all sides.
 For example: If the duct size is 14 x 14 in. square, the minimum roof opening size is 14.5 x 14.5 in. square.

Maximum Roof Opening: There must be a minimum perimeter of 1.75 in. between the roof opening and the roof curb.
 For example: If the roof curb is 75 x 30 in. square, the maximum roof opening is 71.5 x 26.5 in. inches square.

NOTE: The weatherhood and filter sections of the make-up air unit are not supported by the curb.
 This is by design, in order to help alleviate water infiltration issues.



FOOTPRINT



ACCUREX

Wiring Diagram Code:
AN00N401B011A20NU15

CAUTION
 UNIT SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C.
 POWER MUST BE OFF WHILE WIRING.

NOTES
 USE COPPER CONDUCTORS ONLY
 #12 FOR TERMINALS RATED LESS THAN 100 AMPS.
 #10 FOR TERMINALS RATED 100 AMPS OR MORE.
 FIELD CONTROL WIRING RESISTANCE SHOULD NOT EXCEED 0.75 OHM.
 FIELD WIRING FACTORY SUPPLIED AND WIRED.

WIRE COLOR CODE

BK	BLACK	BL	BLUE	BR	BROWN
GY	GRAY	LT BL	LIGHT BLUE	O	ORANGE
PK	PINK	PR	PURPLE	R	RED
W	WHITE	Y	YELLOW		

LEGEND

#AA	MAIN DISCONNECT SWITCH
MB	MOTOR
RC	COOL RELAY
RF	SUPPLY FAN RELAY
RF1	FAN ENABLE RELAY
S4	HEAT AND COOL SWITCH
TRE	TRANSFORMER
TSS	INLET AIR SENSOR - COOL
	JUMPER - COOL - DIFFERENTIAL - 2

Template Drawing: 015 DOC NUMBER: ### REV: ###



ROOF TOP UNIT-GAS HEAT SCHEDULE																					
TAG	AREA SERVED	NOMINAL CAPACITY [TONS]	EER	SEER	AIRFLOW			NET COOLING CAPACITY			GAS HEATING CAPACITY				DIMENSION (INCHS) HXWXL	REFRIGERANT TYPE	APPROXIMATE WEIGHT [lbs.]	ELECTRICAL			MANUFACTURER/MODEL NUMBER
					TOTAL [CFM]	OA [CFM]	ESP [IN. W.C.]	TOTAL [MBH]	SENSIBLE [MBH]	INLET TEMP DB/WB (DEG F)	GAS TYPE	INPUT (MBH)	OUTPUT (MBH)	EFF. (%)				MCA	MOCP	V/P/H	
RTU-1(N)	SEE PLAN	7.5	11.2	15.0	3000	600	1	96.1	68.9	80/67	NATURAL GAS	125	103	82.0	42X60X88	R-410A	1350	43	50	208/60/3	CARRIER/48FCDM08 (OR EQUIVALENT)
RTU-2(N)	SEE PLAN	5.0	11.0	14.0	2000	300	1	62.1	44.6	80/67	NATURAL GAS	67	54	81.0	34X47X75	R-410A	900	36	50	208/60/3	CARRIER/48FCDA06 (OR EQUIVALENT)
RTU-3(N)	SEE PLAN	4.0	11.6	14.0	1600	200	1	51.9	36.1	80/67	NATURAL GAS	67	54	81.0	34X47X75	R-410A	800	31	40	208/60/3	CARRIER/48FCDA05 (OR EQUIVALENT)

NOTES:
 1. CONTRACTOR TO BALANCE OUTSIDE AIR DAMPER ON RTU TO MATCH VALUE MENTIONED IN EQUIPMENT SCHEDULE.
 2. 2" MERV 13 STANDARD FILTERS.
 3. BOTTOM DISCHARGE & RETURN CONFIGURATION.
 4. UNIT TO BE PROVIDED WITH LOW LEAKAGE VOLUME CONTROL DAMPER, NEMA 3R DISCONNECT, FAN WITH VFD, VIBRATION ISOLATION SPRING SUPPORTED BLOWER, INTAKE HOOD, SCREEN INTAKE.
 5. PROVIDE ENTHALPY ECONOMIZER WITH BAROMETRIC RELIEF & FDD FOR ALL RTUS.
 6. PROVIDE FLEXIBLE CONNECTION AT DUCT CONNECTION TO UNIT.
 7. REUSE EXISTING ROOF CURB & PENETRATIONS AS MUCH AS POSSIBLE. REPAIR/REPLACE/MODIFY AS/IF REQUIRED.
 8. PROVIDE VIBRATION ISOLATOR FOR UNIT MOUNTING.
 9. UNIT SHALL BE COMPLETE WITH GAS HEATING SECTION. GAS REGULATOR TO RECEIVE 4.5-14" GAS PRESSURE FROM MAIN.
 10. PROVIDE SMOKE DETECTOR IN SUPPLY AIR SIDE OF RTU-1(N). PROVIDE GLOBAL SHUTDOWN TO ALL HVAC UNITS UPON ACTIVATION OF A BUILDING'S FIRE ALARM SYSTEM.
 11. PROVIDE ALL COMPRESSORS WITH 5 YEAR WARRANTY.
 12. ANTI SHORT CYCLE TIMER.
 13. CONNECT CONDENSATE DRAIN LINE FROM ALL RTUS ON THE ROOF TO THE NEAREST DRAIN POINT. CONNECT TO A DRAIN LINE VIA AIR GAP IN AN APPROVED MANNER.

VENTILATION CALCULATION														
S.NO	SPACE NAME	SPACE AREA (SQ.FT.)	OCCUPANT DENSITY	2022 CALIFORNIA MECHANICAL CODE			2022 CALIFORNIA ENERGY CODE			MAX. OUTSIDE AIR FLOW (CFM)	PROVIDED OSA (CFM)	EXHAUST CFM/SQ.FT	TOTAL EXHAUST AIRFLOW RATE (CFM)	PROVIDED EXHAUST (CFM)
				PEOPLE OA RATE (CFM/PERSON)	AREA OA RATE (CFM/SQFT)	REQUIRED OUTSIDE AIR (CFM)	PEOPLE OA RATE (CFM/PERSON)	OUTSIDE AIR BASED ON PEOPLE (CFM)	AREA OA RATE (CFM/SQFT)					
1	DINING/ORDER COUNTER	1405	45	7.5	0.18	590	15	675	0.5	703	703	0	0	
2	SERVICE	310	4	7.5	0.12	67	15	60	0.15	47	60	0.7	217	
3	PREPERATION	325	5	7.5	0.12	77	15	75	0.15	49	75	0.7	228	
4	DISHWASH	415	3	7.5	0.12	72	15	45	0.15	62	62	0.7	291	
5	HALLWAY	65	0	0	0.06	4	15	0	0.15	10	10	0	0	
6	STORAGE	60	0	5	0.12	7	15	0	0.15	9	9	0	0	
7	OFFICE	65	2	5	0.06	14	15	30	0.15	10	30	0	0	
8	WOMENS RESTROOM	105	0	0	0	0	0	0	0	0	0	0	140	
9	MENS RESTROOM	132	0	0	0	0	0	0	0	0	0	0	210	
	TOTAL	2882	59	-	-	831	-	885	-	889	949	3170	1085	

KITCHEN MAKEUP AIR UNIT SCHEDULE																
UNIT TAG	SERVICE	AIR FLOW CFM	E.S.P. (IN. OF WG)	MOTOR (HP)	EVAPORATIVE COOLING			ELECTRIC DETAILS			BASIS OF DESIGN					
					COOLING TYPE	COOLING MEDIA	TOTAL CAPACITY (MBH)	SUMMER DRY BULB (DEG F)	SUMMER WET BULB (DEG F)	(V/HZ/PH)	MCA	MOCP	DBA	WEIGHT (LBS)	MANUFACTURER	MODEL NO.
MAU-1(N)	HD-1(N)	2,070	0.5	1	EVAPORATIVE	CELdek	27.20	84.80	64.4	208/60/3	7.7	15.00	68.20	1000	ACCUREX	XMSX-P112-H12-MF

NOTE:
 1. UNIT TO BE PROVIDED WITH CLASS 1A LOW LEAKAGE MOTORIZED DAMPER, NEMA 3R DISCONNECT, FAN WITH VFD, VIBRATION ISOLATION SPRING SUPPORTED BLOWER, INTAKE HOOD, SCREEN INTAKE, AND MERV -13 FILTER.
 2. DOUBLE WALL CONSTRUCTION WITH WEATHER PROOF COATING WITH 1 INCH FIBERGLASS INSULATION ALL AROUND THE UNIT.
 3. PROVIDE 14 INCH HIGH CURB FOR UNIT.
 4. REFER TO ACCUREX DRAWINGS ON SHEET M5.5 FOR DETAILED INFORMATION.

AIR BALANCE SCHEDULE					
UNIT	AREA SERVED	SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	RETURN AIR (CFM)	EXHAUST AIR(CFM)
RTU-1(N)	SEE PLAN	3000	600	2400	0
RTU-2(N)	SEE PLAN	2000	300	1700	0
RTU-3(N)	SEE PLAN	1600	200	1400	0
MAU-1(N)	SEE PLAN	2070	2070	0	0
KEF-1(N)	SEE PLAN	0	0	0	2590
EF-1(N)	SEE PLAN	0	0	0	350
TOTAL	-	8670	3170	5500	2940
	BUILDING PRESSURE:		230		POSITIVE

NOTES:
 1. CONTRACTOR TO ADJUST MOTORIZED DAMPER ON FRESH AIR TAP TO PROVIDE OUTSIDE AIR AS MENTIONED IN ABOVE TABLE.

AIR DEVICE SCHEDULE									
TAG	TYPE	MANUFACTURE	MODEL NO	SERVICE	MATERIAL	NECK SIZE (IN)	MAX N.C.	FRAME SIZE (IN)	REMARKS
A	24"x24" LAY-IN LAMINAR AIR DISCHARGE DIFFUSER W/ ROUND NECK	TITUS	TMS	SUPPLY	ALUMINIUM	SEE PLAN	25	24X24	1-6
B	24"x24" PERFORATED SUPPLY W/ ROUND NECK	TITUS	PAS	SUPPLY	ALUMINIUM	SEE PLAN	25	24X24	1-6
C	24"x24" PERFORATED RETURN W/ ROUND NECK	TITUS	PAR	RETURN	ALUMINIUM	SEE PLAN	25	24X24	1-6
D	12"x12" SUPPLY AIR DIFFUSER W/ ROUND NECK	TITUS	TMS	SUPPLY	ALUMINIUM	SEE PLAN	20	12X12	1-6
E	12"x12" EXHAUST AIR GRILLE W/ ROUND NECK	TITUS	350FL	EXHAUST	ALUMINIUM	SEE PLAN	20	12X12	1,3,4,6

NOTES:
 1. NECK SIZE SHOWN ON DRAWINGS. PROVIDE NECK FOR DUCT CONNECTION.
 2. 4-WAY THROW PATTERN UNLESS OTHERWISE SHOWN ON DRAWINGS.
 3. BRANCH DUCT SIZE SHALL BE SAME AS NECK SIZE UNLESS OTHERWISE SHOWN ON DRAWINGS.
 4. FRAME TYPE TO MATCH CEILING CONSTRUCTION, COORDINATE WITH ARCHITECTURAL RCP.
 5. PROVIDE WITH OPPOSED BLADE DAMPER ACCESSIBLE FROM DIFFUSER FACE.
 6. COORDINATE COLOR & FINISH WITH ARCHITECT.

MECHANICAL FAN SCHEDULE												
TAG	QUANTITY	SERVICE	FLOW RATE CFM	STATIC PRESSURE EXTERNAL IN W.G.	ELECTRIC DATA			WEIGHT LBS	BASIS OF DESIGN		REMARKS	
					SPEED RPM	FLA	HP		MANUFACTURER	MODEL		
KEF-1(N)	1	KITCHEN	2,590	1.35	1313	6.6	1.5	208/60/3	200	ACCUREX	XCUBE-180HP-15	2,3,4,5
EF-1(N)	1	RESTROOMS	350	0.5	1491	1.38	1/10	115/60/1	40	GREENHECK	G-090-VG	1,2,5,6,7

NOTES:
 1. INTERLOCK EF-1(N) WITH RTU-2(N). CONFIRM FINAL INTERLOCKING OPTIONS WITH THE OWNER.
 2. INSTALL AS PER MANUFACTURERS RECOMMENDATION.
 3. FAN SHALL BE CONTROLLED BY HOOD CONTROLS. INTERLOCK RTU-3(N) & MAU-1(N) TO OPERATE IN OCCUPIED MODE WHILE KITCHEN EXHAUST FAN IS ENERGIZED.
 4. REFER TO ACCUREX DRAWINGS ON SHEET M5.4 FOR DETAILED INFORMATION ON KEF-1(N).
 5. FAN SPEED SHALL BE FIELD ADJUSTIBLE.
 6. PROVIDE MOTOR STARTERS, DISCONNECTS WITH NEMA-3R (IF NOT FACTORY PROVIDED). ALL EQUIPMENT NORMAL POWER WIRING BY ELECTRICAL CONTRACTOR. COORDINATE REQUIREMENTS.
 7. ROUND OUTLET DUCT COLLAR WITH INTEGRAL BACKDRAFT DAMPER.

AIR CURTAIN SCHEDULE										
MARK	COUNT	DESCRIPTION	AREA SERVED	MANUFACTURER	MODEL	V/PH/Hz	MCA	MOCP	CFM	WEIGHT IN LBS
AC-1(N)	6	AIR CURTAIN- 48 INCH	SEE PLAN	MARS	LPV248-1UA-OB	115/1/60	2.4	15	1200	40

NOTE:
 1. CONTRACTOR TO PROVIDE DOOR SWITCH, NSF LISTING & DELAY TIMER.
 2. SET DELAY TIMER TO 30 SECONDS.
 3. MAINTAIN 7" CLEARANCE FOR MOTOR ACCESS ON SIDE OF AIR CURTAIN.
 4. FINAL ELECTRIC REQUIREMENT NEED TO BE CONFIRMED WITH THE MANUFACTURER.

HOOD SCHEDULE													
UNIT ID	MANUFACTURER	LENGTH (INCHES)	MODEL	SERVICE	SUPPLY		COOKING TEMPERATURE (DEG F)	EXHAUST AIR (CFM)	EXHAUST		CONSTRUCTION	HOOD TYPE	WEIGHT (LBS)
					SUPPLY AIR CFM	COLLAR WIDTHXLENGTH (INCH)			S.P (IN. W.G.)	COLLAR WIDTHXLENGTH (INCH)			
HD-1(N)	ACCUREX	138	XXEW-138-S	SEE PLAN	2,070	24X12	600	2,588	25X10	0.601	STAINLESS STEEL	I	375

1. REFER TO ACCUREX HOOD DRAWINGS ON SHEET M5.1 TO M5.3 FOR EXACT REQUIREMENTS & ACCESSORIES.
 2. HOOD TO BE INSTALLED AS PER MANUFACTURER RECOMMENDATION.
 3. COORDINATE WITH ELECTRICAL CONTRACTOR FOR POWER SUPPLY AND INTEGRATION.
 4. CONNECT TO BUILDING MAIN FIRE ALARM PANEL FOR ALARM INITIATING SWITCH.
 5. DRY CONTACT FOR HOOD FIRE SUPPRESSION SYSTEM TO BE PROVIDED AND ANSUL SYSTEM DESIGN & SUPPLY SHALL BE UNDER THIRD PARTY SCOPE.
 6. INCLUDE HOOD CONTROLLER WITH CONTROL PANEL FOR CONTROL OF HOOD, EXHAUST FAN AND MAKE-UP AIR UNIT. THE CONTROLLER SHOULD INTEGRATE AND CONTROL KITCHEN EXHAUST FAN AND MAKEUP AIR UNITS CONNECTED TO HOOD.



ELECTRICAL SYMBOL LIST	GENERAL NOTES	GENERAL NOTES (CONTINUE)	TITLE 24 GENERAL NOTES	ELECTRICAL DRAWING LIST																																																																																													
<p>☐# DUPLEX RECEPTACLE, # INDICATES CIRCUIT</p> <p>○ SIMPLEX RECEPTACLE</p> <p>⊖ DUPLEX RECEPTACLE, GROUND FAULT CIRCUIT INTERRUPTER</p> <p>⊖ CONTROLLED DUPLEX RECEPTACLE</p> <p>⊖# QUADPLEX RECEPTACLE, # INDICATES CIRCUIT</p> <p>⊖AC ABOVE COUNTER QUADPLEX RECEPTACLE, MOUNT AT +44" AFF UNLESS NOTED OTHERWISE</p> <p>⊖CLG CEILING MOUNTED DUPLEX RECEPTACLE</p> <p>⊖ ABOVE COUNTER DUPLEX RECEPTACLE, MOUNT AT +40" AFF UNLESS NOTED OTHERWISE</p> <p>⊖ FLOOR MOUNTED DUPLEX RECEPTACLE (FLUSH MOUNTED)</p> <p>⊖ FLOOR MOUNTED QUADRUPLX RECEPTACLE (FLUSH MOUNTED)</p> <p>⊖ FLOOR MOUNTED DATA RECEPTACLE (FLUSH MOUNTED)</p> <p>⊖ SPECIAL RECEPTACLE</p> <p>⊖ HEAVY DUTY DISCONNECT SWITCH</p> <p>⊖ DATA OUTLET, INDICATES (1) DATA DROP & (1) PHONE DROP</p> <p>⊖+40" ABOVE COUNTER DATA OUTLET, MOUNT AT +40" AFF UNLESS NOTED OTHERWISE</p> <p>⊖ JUNCTION BOX</p> <p>⊖ PP POWER PULL</p> <p>⊖ CR CARD READER</p> <p>⊖ OS DUAL TECH WALL MOUNTED OCCUPANCY SENSOR WITH AUTO-ON/AUTO-OFF FUNCTION</p> <p>⊖ VS DUAL TECH WALL MOUNTED OCCUPANCY SENSOR WITH MANUAL-ON/AUTO-OFF FUNCTION</p> <p>⊖ OV OVERRIDE SWITCH FOR CEILING OCCUPANCY SENSORS</p> <p>⊖ \$ TOGGLE SWITCH</p> <p>⊖ \$3 3-WAY TOGGLE SWITCH</p> <p>⊖ \$D DIMMER SWITCH</p> <p>⊖ \$m EQUIPMENT MOUNTED CONTROL SWITCH</p> <p>⊖ TV TELEVISION SYSTEMS</p> <p>⊖ CS CEILING MOUNTED OCCUPANCY SENSOR</p> <p>⊖ PC CEILING MOUNTED PHOTOCELL</p> <p>↪ 3/4" STUB UP TO ABOVE ACCESSIBLE CEILING WITH END BUSHING</p> <p>— CONDUIT CONCEALED IN WALL/ABOVE THE CEILING</p> <p>— CONDUIT IN CONCRETE SLAB/UNDERGROUND</p> <p>⊖ S CEILING MOUNTED SPEAKER</p> <p>⊖ UNIVERSAL MOUNTED (CEILING/WALL) EXIT SIGN WITH CHEVRONS</p> <p>⊖ DC SECURITY DOOR CONTACT (PREPARE DOOR, ROUGH-IN ONLY UP TO ABOVE ACCESSIBLE CEILING)</p> <p>⊖ SINGLE POLE DISCONNECT SWITCH TOGGLE STYLE</p> <p>⊖ MOTOR WITH MOTOR RATED DISCONNECT SWITCH.</p> <p>⊖ W WIRELESS ACCESS POINT</p> <p>⊖ AV AUDIO/VISUAL RECEPTACLE</p> <p>⊖ USB RECEPTACLE</p> <p>⊖ WP WEATHERPROOF DUPLEX RECEPTACLE</p> <p>⊖ SECURITY CAMERA PROVIDED BY OWNER. EC TO PROVIDE CAT6 CABLING AND ROUGH-IN.</p> <p>⊖ LCP LIGHTING CONTROL PANEL</p>	<ol style="list-style-type: none"> THIS INSTALLATION SHALL BE IN COMPLIANCE WITH ALL CURRENTLY APPLICABLE ELECTRICAL AND LOCAL CODES. BEFORE COMMENCING WORK THE CONTRACTOR SHALL VISIT THE JOB SITE AND FULLY INFORM HIMSELF OF ALL CONDITIONS THAT AFFECT THE WORK, EXAMINE THE DRAWINGS AND SPECIFICATIONS, AND SUBMIT ANY QUESTIONS IN WRITING TO THE ENGINEER. ALL ELECTRICAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND ALL OTHER DRAWINGS RELATED TO THE PERFORMANCE OF THE WORK. THE CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THIS WORK SHALL BECOME THOROUGHLY FAMILIAR WITH THE PROJECT SPECIFICATIONS BEFORE COMMENCING ANY WORK. THE PROJECT SPECIFICATIONS AND DRAWINGS FORM THE BASIS OF THIS CONTRACT REQUIREMENTS AND INCLUDE THE TYPE AND GRADE OF MATERIALS TO BE INSTALLED, EQUIPMENT TO BE FURNISHED, THE MANNER BY WHICH TO BE INSTALLED AND WHERE TO BE LOCATED. IN THE EVENT OF A CONFLICT BETWEEN THE PROJECT SPECIFICATIONS AND DRAWINGS, SPECIFICATIONS GOVERN UNLESS THE ARCHITECT/ENGINEER DIRECTS OTHERWISE. THE ELECTRICAL CONTRACTOR SHALL CHECK CAREFULLY ALL CONSTRUCTION DRAWINGS AND SPECIFICATIONS THAT ARE PART OF THIS PROJECT TO ENSURE THAT NO FIXTURE, OUTLET, ALARM STATION OR CONTROL AND POWER WIRING IS OMITTED. HE SHALL CONSULT ALL TRADES FURNISHING EQUIPMENT AND OBTAIN FROM THEM ALL DATA. IN SOME CASES EQUIPMENT, FIXTURES AND DEVICES ARE SHOWN ONLY. ASCERTAIN AND PROVIDE THE WIRING AND CONTROL STATIONS REQUIRED FOR THE PROPER FUNCTION OF BUILDING EQUIPMENT. NO EXTRA CHARGES SHALL BE ACCEPTED BY OWNER AFTER BIDDING FOR SUCH EQUIPMENT AND LABOR. EQUIPMENT LABELS AND INSTRUCTIONS REGARDING THE APPLICATION AND INSTALLATION OF THE LISTED EQUIPMENT SHALL BE FOLLOWED TO INSURE THAT THE EQUIPMENT IS BEING INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S LISTING INSTRUCTIONS. THE TEMPERATURE RATING OF THE EQUIPMENT TERMINATIONS MUST BE CAREFULLY CORRELATED WITH THE CONDUCTOR AMPACITY TO PREVENT OVERHEATING AND PREMATURE FAILURE. INSTALL ELECTRICAL DEVICES AS INDICATED IN THIS SET OF DRAWINGS. ADJUST FINAL DEVICE LOCATIONS AS REQUIRED TO ACCOMMODATE WORK. COORDINATE WITH ALL TRADES INVOLVED AND WITH ARCHITECTURAL CASEWORK AND ELEVATIONS DRAWINGS. NOTIFY THE ENGINEER AND/OR THE ARCHITECT IF ANY CONFLICTS ARE FOUND PRIOR TO BIDDING PROJECT. INSTALL CONDUIT AND BOXES TO CLEAR EMBEDDED DUCTS, OPENINGS AND OTHER STRUCTURAL FEATURES. ALL LIGHTING FIXTURES ARE TO BE LOCATED AS REQUIRED ON THE JOB TO CLEAR DUCTS, PIPING, EQUIPMENT, AND/OR MECHANICAL UNITS. CONDUIT RUNS SHOWN ON DRAWINGS ARE DIAGRAMMATIC. ALL CONDUITS SHALL RUN IN CONCEALED EXCEPT IN EQUIPMENT ROOMS AND WHERE APPROVED BY ARCHITECT. FURNISH AND INSTALL EQUIPMENT DISCONNECT SWITCHES IN STRICT COMPLIANCE WITH CODE REQUIREMENTS. ADJACENT POWER AND DATA DEVICES SHALL BE SPACED NO MORE THAN 4" APART. PROVIDE JUNCTION BOX MOUNTING BRACKET BETWEEN STUDS AS NEEDED. ALL RECEPTACLES, TELEPHONE, AND DATA OUTLETS SHALL BE MOUNTED PER MOUNTING HEIGHT LEGEND OR TO MATCH BUILDING STANDARD, UNLESS OTHERWISE NOTED. ALL WALL MOUNTED FIRE ALARM NOTIFICATION DEVICES SHALL BE MOUNTED AT 80" AFF IN ACCORDANCE WITH ADA. DETERMINE, IN ADVANCE OF PURCHASE, THAT ALL ELECTRICAL MATERIALS AND EQUIPMENT TO BE INSTALLED SHALL FIT INTO THE ROOM OR SPACE ALLOCATED, AS INDICATED ON THE DRAWINGS. ALLOWING SUFFICIENT CLEARANCE FOR THE SAFE SERVICE AND/OR MAINTENANCE OF RELATED EQUIPMENT, INCLUDING THAT OF OTHER TRADES. EC TO PROVIDE TELEPHONE AND DATA SYSTEM CABLING, JACKS, AND PATCH PANELS FOR ALL TELEPHONE AND DATA LOCATIONS AS A TESTED AND WARRANTED SYSTEM FOR AT LEAST 1 YEAR ON PARTS AND LABOR. ALL CIRCUITS SHALL HAVE AN EQUIPMENT GROUNDING CONDUCTOR INSTALLED. COLOR OF GROUNDING CONDUCTOR SHALL BE GREEN. SIZE OF GROUNDING CONDUCTOR SHALL BE AS REQUIRED PER NEC ARTICLE 250.122. ALL BRANCH CIRCUITS SHALL HAVE A DEDICATED NEUTRAL CONDUCTOR INSTALLED UNLESS OTHERWISE INDICATED. COLOR OF NEUTRAL CONDUCTOR SHALL BE WHITE. ALL CONDUCTOR SHALL BE MADE OF COPPER. MINIMUM WIRE SIZE SHALL BE #12AWG UNLESS OTHERWISE INDICATED. UTILIZE SOLID CONDUCTORS FOR WIRE GAGES UP TO #12AWG AND STRANDED CONDUCTOR FOR GAGES #10AWG AND LARGER. SPECIAL RECEPTACLES PLUG CONFIGURATION REQUIREMENTS SHALL BE COORDINATED WITH EQUIPMENT PLUG REQUIREMENTS PRIOR TO INSTALLATION. ALL FEEDER AND BRANCH CIRCUIT WIRING INSTALLED INDOORS SHALL USE THHN INSULATION. ALL WIRING INSTALLED OUTDOORS SHALL USE THWN INSULATION. REFER TO SPECIFICATION DOCUMENTS FOR COLOR CODED REQUIREMENTS. ALL POWER WIRING SHALL BE INSTALLED IN A DEDICATED RACEWAY SYSTEM. MINIMUM RACEWAY SIZE SHALL BE 3/4" UNLESS OTHERWISE INDICATED. CONTRACTOR SHALL SIZE ALL CONDUITS SO AS TO NOT EXCEED 40% OF CONDUIT FILLING CAPACITY PER NEC. ALL PULL BOXES AND JUNCTION BOXES SHALL BE SIZED PER NEC, BASED ON THE AMOUNT OF CABLE AND CONDUITS ENTERING/LEAVING THE BOX. ALL CIRCUITS SERVING EMERGENCY EXIT SIGNS AND NIGHT LIGHTS SHALL UTILIZE #10 WIRE TO MINIMIZED VOLTAGE DROP. ALL BREAKERS SERVING FIRE ALARM EQUIPMENT SHALL HAVE LOCK-OUT DEVICE INSTALLED UNLESS OTHERWISE INDICATED. AUXILIARY GUTTERS UTILIZING MORE THAN 30 AMPERE CARRYING CONDUCTORS SHALL BE DERATED ACCORDING TO THE ADJUSTMENT FACTORS IN ARTICLE 310.15(B)(2)(a). 	<ol style="list-style-type: none"> SWITCHBOARD, DISTRIBUTION PANELS AND BRANCH CIRCUIT PANELBOARDS, SHALL HAVE A PANEL DIRECTORY INSTALLED. UTILIZE TYPE WRITER AS A MINIMUM FOR COMPLIANCE. HAND WRITTEN CARD DIRECTORIES ARE NOT ACCEPTABLE. REFER TO SPECIFICATIONS, ELECTRICAL IDENTIFICATION FOR REQUIREMENTS. ALL FINAL CONNECTIONS TO MOTORS AND VIBRATING EQUIPMENT SHALL BE DONE WITH LIQUID TIGHT FLEXIBLE METAL CONDUIT. INSTALL GREEN GROUNDING CONDUCTOR. ALL FINAL BREAKERS AND CONDUCTORS SIZES SERVING MECHANICAL EQUIPMENT SHALL BE COORDINATED WITH MECHANICAL SHOP DRAWINGS PRIOR TO INSTALLATION. E.C. SHALL COORDINATE WITH HVAC CONTRACTOR EXACT POINT OF CONNECTION TO MECHANICAL UNITS PRIOR TO ROUGH-IN. SWITCHBOARDS, DISTRIBUTION PANELS, BRANCH PANELBOARDS, TRANSFER SWITCHES, METERS, ETC SHALL BE LABEL WITH A READILY VISIBLE LABEL PER NFPA 70E-2009 STANDARD FOR SAFETY IN THE WORKPLACE. LABEL SHALL BE CLEARLY VISIBLE TO PERSONNEL AND SHALL READ "CAUTION ARC FLASH HAZARD" ALSO LABELS SHALL INDICATE THE "PPE" LABEL AT EQUIPMENT. SIZE AND COLOR OF TEXT SHALL BE PER STANDARD. REFER TO SPECIFICATIONS, ELECTRICAL IDENTIFICATION FOR REQUIREMENTS. ALL EQUIPMENT INSTALLED OUTSIDE SHALL BE WEATHER PROOF RATED. REFER TO DRAWINGS FOR ADDITIONAL INFORMATION. INSTALL CONDUIT FROM THE TOP OF THE BAR JOIST. LABEL ALL J-BOXES COVER PLATES, RECEPTACLES COVER PLATES WITH CIRCUIT INFORMATION. E.C. SHALL FURNISH AND INSTALL J-BOX AND 3/4" FOR MECHANICAL, THERMOSTAT. COORDINATE FINAL LOCATION WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. ALL MOUNTING HEIGHTS OF DEVICES SHALL BE COORDINATED WITH ARCHITECTURAL ELEVATIONS OR ARCHITECT PRIOR TO ROUGH-IN. DO NOT INSTALL DEVICES IN DIFFERENT ROOMS BACK TO BACK. PROVIDE 6" SIDE BY SIDE IN BETWEEN. REFER TO ARCHITECTURAL CASEWORK DRAWINGS AND ARCHITECTURAL ELEVATIONS FOR EXACT DEVICES MOUNTING HEIGHTS. ALL WORK SHALL CONFORM TO ALL REQUIREMENTS OF STATE OF CALIFORNIA TITLE 24 REGARDLESS OF THE INFORMATION INDICATED ON THESE PLANS. IT IS THE RESPONSIBILITY OF THE INDIVIDUAL SUPERVISING THE CONSTRUCTION TO ENSURE THAT THE WORK IS DONE IN ACCORDANCE WITH CODE REQUIREMENTS PRIOR TO REQUESTING INSPECTION. ELECTRICAL CONTRACTOR SHALL MARK IN FIELD THE MAXIMUM AVAILABLE FAULT CURRENT AT SERVICE EQUIPMENT. THE FIELD MARKINGS SHALL INCLUDE THE DATE THE FAULT CURRENT CALCULATION WAS PERFORMED AND BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED. CEC 110.24(A). SEE SHEET E-600 FOR MAXIMUM AVAILABLE FAULT CURRENT THAT WAS RECEIVED FROM THE UTILITY COMPANY ON AUGUST 31, 2020. THE ISSUANCE OF A PERMIT SHALL NOT PREVENT THE BUILDING OFFICIAL FROM REQUIRING THE CORRECTION OF ERRORS ON THESE PLANS OR FROM PREVENTING ANY VIOLATION OF THE CODES ADOPTED BY THE CITY, RELEVANT LAWS, ORDINANCES, RULES AND/OR REGULATIONS. 	<ol style="list-style-type: none"> PROGRAM LIGHTING CONTROL SYSTEM TO TURN OFF COMMON AREA LIGHTING BASED ON OWNERS NORMALLY OCCUPIED HOURS OR PROVIDE OCCUPANCY CONTROL (SEE FLOOR PLANS FOR MORE INFORMATION). CORRIDOR / HALL AREA SHALL HAVE OCCUPANCY CONTROL TO DIM 50% WHEN NOT OCCUPIED FOR 30 MINUTES AND TURN OFF DURING UNOCCUPIED HOURS. ALL LIGHTING SHALL HAVE MANUAL CONTROL UNLESS NOTED OTHERWISE. EXTERIOR LIGHTING SHALL BE CONTROLLED BY TIME-CLOCK, COORDINATE PROGRAMMING WITH OWNER. THIS IS A PARTIAL LIST IF REQUIREMENTS AND DOES NOT EXCUSE OTHER REQUIREMENTS NOTED ON THE DRAWINGS, SPECIFICATIONS, OR APPLICATION CODES. CONTROLLED OUTLETS SHALL BE CONTROLLED BY AREA OCCUPANCY SENSORS OR TIME CLOCK / CONTRACTORS. PROVIDE A POWER PACK OR CONTRACTOR PER CIRCUIT, SEE FLOOR PLANS FOR ADDITIONAL INFORMATION. 	<p>E-001 - ELECTRICAL LEGENDS AND GENERAL NOTES</p> <p>E-002 - ELECTRICAL SPECIFICATIONS</p> <p>E-100 - ELECTRICAL LIGHTING PLAN</p> <p>E-200 - ELECTRICAL POWER PLAN</p> <p>E-201 - ELECTRICAL POWER PLAN - ROOF</p> <p>E-300 - ELECTRICAL RISER & PANELS</p> <p>E-400 - ELECTRICAL DETAILS</p> <p>E-500 - TITLE 24 - 1</p> <p>E-501 - TITLE 24 - 2</p>																																																																																													
POWER GENERAL NOTES			SYSTEMS ROUGH-IN GENERAL NOTES																																																																																														
<ol style="list-style-type: none"> ELECTRICAL CONTRACTOR SHALL COORDINATE ALL REQUIREMENTS FOR MECHANICAL AND PLUMBING EQUIPMENT WITH ASSOCIATED CONTRACTOR, WHERE A SERVICE DISCONNECT, STARTER, AND/OR VFD IS NOT SHOWN IT IS TO BE PROVIDED WITH THE EQUIPMENT. COORDINATE EXACT PLACEMENT OF EQUIPMENT PRIOR TO ROUGH-IN. COORDINATE DEVICE LOCATIONS WITH ARCHITECTURAL ELEVATIONS PRIOR TO ROUGH-IN. MINIMUM WIRE SIZE IS #12 COPPER. MINIMUM CONDUIT SIZE IS 3/4". BRANCH CIRCUITS SHALL INCLUDE #12 CONDUCTORS FOR EACH PHASE, #12 DEDICATED NEUTRAL, AND #12 GROUND IN A 3/4" CONDUIT UNLESS OTHERWISE NOTED. EC SHALL COORDINATE EXACT PLACEMENT OF DEVICES SPECIFICALLY SHOWN TO SERVICE AN APPLIANCE OR WORKSTATION. REFER TO ARCHITECTURAL FURNITURE PLANS AND ELEVATIONS AND NOTIFY THE ENGINEER VIA RFI EXACT DEVICE LOCATION IS NOT CLEAR. ENSURE INSTALLATION AND MAINTENANCE ACCESS PANELS FOR EQUIPMENT AND DEVICES LOCATED IN INACCESSIBLE WALL OR CEILING CAVITIES. NON-FIRE-RATED CONSTRUCTION SHALL BE LARSEN'S MODEL L-SLK "SHUR-LOK" AUTOMATIC SPRING-BOLT LOCK ACCESS DOOR. 1-HR FIRE-RATED SHALL BE LARSEN'S MODEL LFR-CL FIRE RATED ACCESS DOOR, WITH CYLINDER LOCK. 			ADDITIONAL NOTES FOR GC																																																																																														
LIGHTING GENERAL NOTES			APPLICABLE CODE																																																																																														
<ol style="list-style-type: none"> CONNECT EMERGENCY LIGHTS (SHADED AND/OR HALF SHADED) AND EXIT SIGNS TO LOCAL LIGHTING CIRCUIT AHEAD OF LOCAL SWITCHING. OCCUPANCY SENSORS SHALL BE WIRED UPSTREAM OF LOCAL SWITCHING UNLESS NOTED OTHERWISE. THE IR PART OF SENSOR SHALL TURN ON THE LIGHTS AND THE ULTRASONIC PART SHALL MAINTAIN LIGHTING CONTROL OF THE SPACE. PROVIDE APPROPRIATE LOCATION AND QUANTITY OF OCCUPANCY SENSORS AND POWER PACKS REQUIRED FOR PROPER OPERATION REGARDLESS OF QUANTITIES AND LOCATIONS SHOWN ON DRAWINGS (MINIMUM QUANTITIES SHOWN). ALL SENSORS IN A ROOM / AREA SHALL OPERATE PARALLEL. CONTRACTOR SHALL INCLUDE THE COST TO INSTALL (4) ADDITIONAL OCCUPANCY SENSORS AND (4) ADDITIONAL POWER PACKS. MATERIAL SHALL BE TURNED OVER TO THE OWNER AS SPARE PARTS IF UNUSED. PROVIDE POWER PACKS FOR CONTROLLED RECEPTACLES (1 POWER PACK PER CIRCUIT), SEE FLOOR PLANS FOR MORE INFORMATION. ALL COMMON CORRIDOR LIGHTING ON EACH FLOOR SHALL BE CONTROLLED AS ONE ZONE VIA OCCUPANCY SENSORS. CORRIDOR LIGHTING SHALL HAVE 2 LEVELS OF AUTOMATED DIMMING. 50% AFTER 30 MINS OF NO OCCUPANCY AND TURN OFF AFTER 1 HOUR OF NO OCCUPANCY. PROVIDE PROGRAMMING AND TRAINING FOR ALL LIGHTING CONTROL. EXTERIOR LIGHT POLLUTION MUST COMPLY WITH CGC SECTION 5.106.8. 			<p>TITLE 24 C.C.R., PART3 2022 CALIFORNIA ELECTRICAL CODE (CEC)</p> <p>TITLE 24 C.C.R., PART6 2022 CALIFORNIA ENERGY CODE</p>																																																																																														
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A. GENERAL REQUIREMENTS

1. SCOPE OF WORK

FURNISH AND INSTALL A COMPLETE ELECTRICAL SYSTEM AS SHOWN ON THE CONTRACT DRAWINGS. THE INSTALLATION SHALL BE COMPLETE IN EVERY DETAIL ESSENTIAL TO PROPER AND SATISFACTORY OPERATION, READY FOR USE AND IN CONDITION FOR SERVICE WHEN DELIVERED TO THE OWNER. ALL MANUFACTURED ITEMS SHALL BE ERECTED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS AND RECOMMENDATIONS EXCEPT AS OTHERWISE SPECIFIED HEREIN.

2. APPROVALS

OBTAIN APPROVALS FROM INSPECTION AUTHORITIES FOR ELECTRICAL INSTALLATIONS REQUIRING SPECIFIC APPROVAL. PRINTS OF THE ELECTRICAL DRAWINGS, FOR THIS PURPOSE, WILL BE FURNISHED UPON REQUEST. REQUIRED WIRING DIAGRAMS SHALL BE PROVIDED AND SUBMITTED FOR APPROVAL BY THE CONTRACTOR. COPIES OF THE FINAL APPROVALS SHALL BE OBTAINED BEFORE COMMENCEMENT OF RELATED WORK.

3. CODES AND STANDARDS

a. THE WORK SHALL COMPLY WITH ALL APPLICABLE LOCAL, MUNICIPAL, AND NATIONAL CODES, WHERE THE CONSTRUCTION DOCUMENTS INDICATE MORE RESTRICTIVE REQUIREMENTS. THE CONSTRUCTION DOCUMENTS SHALL GOVERN, HOWEVER, THE CONSTRUCTION DOCUMENTS SHALL NOT BE INTERPRETED AS AUTHORITY TO VIOLATE ANY CODE OR REGULATION.

b. MATERIALS, EQUIPMENT AND INSTALLATION SHALL CONFORM TO LOCAL CODE AND STANDARDS, THE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA), UNDERWRITER'S LABORATORIES (UL), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) AND ALL LAWS AND ORDINANCES OF LOCAL, STATE AND FEDERAL GOVERNING AGENCIES.

4. FEES

CONTRACTOR SHALL PAY ALL FEES AND OTHER CHARGES INCIDENTAL TO THE ELECTRICAL WORK. IN ADDITION CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING REQUIRED INSURANCE, PERMITS, LICENSES, ETC. RELATING TO THE ELECTRICAL WORK.

5. CONTRACTOR'S LIABILITY

a. THE CONTRACTOR SHALL AGREE THAT THE OWNER, THE ARCHITECT AND THE ENGINEER SHALL NOT IN ANY FORM OR MANNER BE ANSWERABLE OR ACCOUNTABLE FOR ANY VIOLATION OF ORDINANCES, CODES OR REGULATIONS OF ANY AUTHORITIES, UTILITIES, INSURANCE COMPANIES AND GOVERNMENT AGENCIES HAVING JURISDICTION, OR FOR ANY ACCIDENTS, INJURY, LOSS OR DAMAGE TO ANY PERSON OR PERSONS AND THEIR PROPERTIES ARISING FROM NEGLIGENCE OR CARELESSNESS ON THE PART OF THE CONTRACTOR (NOR ANYONE IN HIS EMPLOY), ANY OF HIS SUBCONTRACTORS, OR ANY OTHER PARTIES OR AGENTS TO THIS CONTRACT.

b. THE CONTRACTOR SHALL AGREE TO MAKE GOOD TO SAID OWNER, ARCHITECT, AND ENGINEER ANY LOSS, DAMAGE OR EXPENSE SO INCURRED, TOGETHER WITH REASONABLE ATTORNEY'S FEES.

6. EXAMINATION OF DRAWINGS AND SITE

a. THE ELECTRICAL CONTRACTOR SHALL OBTAIN A COMPLETE SET OF ARCHITECTURAL AND ENGINEERING DOCUMENTS AND COORDINATE WITH MECHANICAL, PLUMBING, ARCHITECTURAL, AND OTHER TRADES FOR EXACT DIMENSIONS, CLEARANCES, ROUGH-IN LOCATIONS, AND OTHER ADDITIONAL SCOPES OF WORK THAT MAY NOT BE SHOWN ON THE ELECTRICAL PLANS. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE POWER TO OTHER TRADES EQUIPMENT AND HARDWARE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, CONTROLS, FIRE AND SECURITY SYSTEMS, MOTORIZED DOORS, DAMPERS, LIFTS, AND OTHER SYSTEMS. UNLESS SPECIFICALLY NOTED OTHERWISE ON THE ELECTRICAL PLANS, THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL SAFETY DISCONNECT SWITCHES TO MECHANICAL EQUIPMENT.

b. BY THE ACT OF HAVING SUBMITTED A BID, THE CONTRACTOR SHALL DEEM TO HAVE MADE SUCH AN EXAMINATION AND SHALL HAVE ACCEPTED THE PREVAILING CONDITIONS. NO SUBSEQUENT ALLOWANCE WILL BE MADE TO CONTRACTOR BECAUSE OF HIS NEGLIGENCE IN COMPLYING WITH THE FOREGOING.

7. DRAWINGS AND SPECIFICATIONS

THE CONTRACTOR SHALL BE RESPONSIBLE FOR READING AND COMPLYING WITH BOTH THE DRAWINGS AND SPECIFICATIONS. IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN THE DRAWINGS, NOTES, SPECIFICATIONS, OR CODES, THE REFERENCE WHICH PROVIDES THE MORE COMPLETE OR HIGHER STANDARD SHALL PREVAIL.

8. INTERPRETATION OF THE DOCUMENTS

CAREFULLY COMPARE THE DRAWINGS AND SPECIFICATIONS, CHECKING MEASUREMENTS AND CONDITIONS UNDER WHICH THIS INSTALLATION IS TO BE MADE. FOR CLARIFICATION BETWEEN VARIOUS DRAWINGS, BETWEEN DRAWINGS OR SPECIFICATION, OR BETWEEN SECTIONS OF THE SPECIFICATION, THE MATTER SHALL BE REFERRED TO THE ENGINEER BEFORE ANY WORK IS EXECUTED. THE CONTRACTOR SHALL STATE IN THEIR PROPOSAL ANY EXCEPTIONS NECESSARY TO MAKE THIS A COMPLETE, READY TO USE INSTALLATION. IF NOT STATED IN THE PROPOSAL, IT WILL NOT BE CONSIDERED EXTRA.

9. ELECTRICAL DRAWINGS

THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL DOORS, WALLS, FURNITURE, EQUIPMENT, ETC. THE LOCATION OF RACEWAY SYSTEM COMPONENTS IS SCHEMATIC. THE EXACT LOCATION OF RACEWAY SYSTEM COMPONENTS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD. THE CONTRACTOR SHALL CONFIRM THE DIMENSIONS OF THE ACTUAL EQUIPMENT TO BE SUPPLIED FOR THIS PROJECT, AND VERIFY CLEARANCES AND ROUGH-INS PRIOR TO STARTING WORK.

10. PERMITS, APPLICATIONS AND RELEASES

THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, INSPECTIONS, APPLICATIONS, RELEASES AND FEES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES FOR THE EXECUTION OF THIS WORK. SCHEDULING OF ALL REQUIRED INSPECTIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

B. INSTALLATION

1. CUTTING AND PATCHING

a. ALL CUTTING, DRILLING, PATCHING, ETC. NECESSARY FOR INSTALLATION OF EQUIPMENT UNDER THIS CONTRACT SHALL BE DONE BY THIS CONTRACTOR.

b. ALL DISTURBED CONSTRUCTION AND FINISHED SHALL BE RETURNED TO ITS ORIGINAL STATE. HOLES IN CONCRETE WALLS AND FLOORS SHALL BE CORE DRILLED AND SLEEVED. NO CUTTING OF STRUCTURAL MEMBERS WILL BE ALLOWED.

2. INSTALLATION OF WIRING

WIRE SHALL BE INSTALLED CONTINUOUS BETWEEN DEVICES, WITH SPLICES LOCATED ONLY IN JUNCTION BOXES, PULL BOXES, OUTLET BOXES OR IN CABINETS. CONDUCTORS SHALL BE OF SUFFICIENT LENGTH TO REACH THE FARTHEST TERMINAL IN PANELS. A MINIMUM OF 6" LOOPS SHALL REMAIN WHERE CONNECTIONS OR TAPS ARE TO BE MADE IN BRANCH CIRCUIT WIRING.

3. GROUNDING

CONTRACTOR SHALL INSTALL ENTIRE CONDUIT SYSTEM, INCLUDING BOXES, CABINETS, PANELS, ETC. SO AS TO INSURE PROPER GROUND CONTINUITY THROUGHOUT THE SYSTEM.

4. INSTALLATION OF WORK

a. CONTRACTOR SHALL BE RESPONSIBLE FOR EXACT LOCATION OF ALL EQUIPMENT AND IN CASE ANY OUTLETS DO NOT COME IN CORRECT LOCATION, HE SHALL MOVE SAME, DO NECESSARY CUTTING AND PATCHING.

b. OWNER RESERVES THE RIGHT TO CHANGE LOCATION OF OUTLETS WITHIN 10'-0" RADIUS BEFORE WORK IS INSTALLED WITHOUT EXTRA COST.

c. CHECK WITH HVAC CONTRACTOR AS TO LOCATION OF UNITS, DUCTS AND GRILLES AND PLUMBING CONTRACTOR AS TO LOCATION OF PIPING BEFORE INSTALLING THE WORK.

d. CONTRACTOR SHALL CONSULT WITH THE ARCHITECT AND REVIEW THE PLANS TO VERIFY THE EXACT LOCATIONS OF ALL OUTLETS ARE ABOVE COUNTERS WHERE CABINET WORK OCCURS, AND VERIFY THAT SWITCHES ARE AT THE CORRECT SIDE OF DOOR SWINGS.

e. THE CONTRACTOR SHALL CONSULT WITH THE EQUIPMENT SUPPLIERS FOR THE CORRECT SIZES OF ALL OUTLETS IN SUFFICIENT TIME BEFORE WALL CONSTRUCTION.

f. FAILURE OF THE CONTRACTOR TO COMPLY WITH ALL OF THE ABOVE SHALL MAKE HIM RESPONSIBLE FOR ANY RELOCATIONS AT HIS EXPENSE DUE TO CONFLICT WITH OTHER EQUIPMENT.

5. BALANCING OF LOADS

UPON CONNECTING ALL CIRCUITS TO PANELS, THE CONTRACTOR SHALL BALANCE THE LOAD IN AMPERES TO +/- 5% BETWEEN PHASES FOR EACH PANEL OR PER OWNERS SATISFACTION.

6. FIRE STOPPING

ALL PENETRATIONS IN WALL, FLOOR OR CEILINGS SHALL BE SUITABLY CLOSED UP AND SEALED WITH AN INTUMESCENT FIRE STOPPING COMPOUND LISTED IN THE MOST RECENT FACTORY MUTUAL RESEARCH CORPORATION (FMRC) APPROVAL GUIDE. FIRE STOPPING PRODUCTS SHALL BE MANUFACTURED BY 3M CO.

7. EQUIPMENT

ALL MATERIALS AND EQUIPMENT USED IN THIS INSTALLATION SHALL BE NEW, AND HAVE THE APPROPRIATE UL LISTING AND LABEL.

8. MISCELLANEOUS SUPPORTING MEMBERS

THE INSTALLATION OF ANGLES CHANNELS, AND OTHER MISCELLANEOUS STEEL, BOLTS, RODS, ETC. REQUIRED TO SUPPORT LIGHT FIXTURE, CONDUIT, RACEWAY, LADDER TRAY, OR OTHER ELECTRICAL EQUIPMENT OR DEVICES SHALL BE COORDINATED WITH THE G.C.

9. SAFETY

THE CONTRACTOR SHALL TAKE ALL STEPS NECESSARY TO ENSURE THE SAFETY OF THE OWNERS EMPLOYEES, BUILDING EMPLOYEES AND GUESTS, AS WELL AS THEIR OWN FORCES, BY ADEQUATELY PROTECTING ANY EXPOSED LIVE CONDUCTORS, OR DEVICES THROUGHOUT THE COURSE OF THIS WORK.

10. EQUIPMENT CONNECTIONS

PROVIDE FINAL CONNECTIONS FOR ALL EQUIPMENT FURNISHED UNDER OTHER DIVISIONS AND FOR ALL OWNER FURNISHED EQUIPMENT. PROVIDE A FLEXIBLE LIQUID TIGHT CONNECTION TO ALL VIBRATION PRODUCING EQUIPMENT.

11. TEMPORARY LIGHTING, POWER, FIRE, AND SAFETY

- PROVIDE TEMPORARY LIGHTING AND POWER AS REQUIRED IN AREAS UNDERGOING WORK DURING CONSTRUCTION.
- COMPLY WITH NFPA 241 FOR SAFEGUARDING DURING CONSTRUCTION AND ALTERATION OPERATIONS.

12. BRANCH CIRCUITS

BRANCH CIRCUITS TO RECEPTACLES, LIGHTING AND MISC. SMALL LOADS (20 AMP CIRCUITS), UNLESS SPECIFICALLY NOTED OTHERWISE, SHALL BE 2-#12, 1-#12G, 3/4" C.

C. MATERIAL AND EQUIPMENT

1. PROPOSALS SHALL BE BASED UPON THE FURNISHING OF ALL MATERIALS AND EQUIPMENT AS SPECIFIED, WHICH IN EVERY CASE SHALL BE NEW AND OF THE BEST GRADE AND QUALITY AVAILABLE.

2. EQUIPMENT AND MATERIALS SHALL BE WITHOUT BLEMISH OR DEFECT AND SHALL NOT BE USED FOR TEMPORARY POWER PURPOSES, WITHOUT THE ENGINEER'S PRIOR WRITTEN AUTHORIZATION.

3. ALL ITEMS OF EQUIPMENT OF ONE TYPE, EXCEPT CONDUIT, CONDUIT FITTINGS, OUTLET BOXES, WIRE, AND CABLE, SHALL BE THE PRODUCT OF ONE MANUFACTURER THROUGHOUT UNLESS OTHERWISE INDICATED OR ACCEPTED BY THE ENGINEER.

4. CONDUITS

a. THE CONTRACTOR SHALL PROVIDE ALL CONDUITS SERVING ALL EQUIPMENT, INCLUDING BUT NOT LIMITED TO LIGHTING, RECEPTACLES, HEATING, AIR CONDITIONS, PLUMBING EQUIPMENT, TELEPHONE AND ELECTRICAL EQUIPMENT.

b. ALL PANEL AND SERVICE FEEDERS SHALL BE IN RIGID GALVANIZED STEEL CONDUIT (RGSC). ALL CONDUIT SHALL BE UL LABELED. EMT SHALL BE ACCEPTABLE FOR BRANCH CIRCUITS RUN ABOVE SUSPENDED CEILINGS OR CONCEALED IN INTERIOR PARTITIONS. EMT CONNECTORS SHALL BE COMPRESSION TYPE. CONDUIT UNDER SLAB ON GRADE SHALL BE GALVANIZED RIGID STEEL.

c. MINIMUM SIZES OF CONDUIT SHALL BE 3/4" FOR INDIVIDUAL LIGHTING FIXTURE CONNECTION OR TO INDIVIDUAL LIGHT SWITCHES AND FOR ALL OTHER LOCATIONS. IF HVAC CONTROL WIRING IS REQUIRED TO BE RUN IN CONDUIT, IT SHALL BE MINIMUM OF 1/2" SIZE, UNLESS NOTED OTHERWISE ON DRAWINGS. ALL IN/UNDER FLOOR SLAB CONDUIT SHALL BE OF MINIMUM 1" SIZE.

d. SUPPORT ALL CONDUIT.

e. GENERALLY, ALL CONDUIT SHALL BE CONCEALED EXCEPT FOR UNFINISHED AREAS, SUCH AS EQUIPMENT ROOMS. EXPOSED CONDUIT SHALL BE ALLOWED ONLY AS NOTED ON PLAN AND AS APPROVED BY THE OWNERS CONSTRUCTION MANAGER. PAINTING OF CONDUITS WILL BE BY GENERAL CONTRACTOR.

f. FLEXIBLE METAL CONDUIT

1. FLEXIBLE METAL CONDUIT AND THEIR ASSOCIATED FITTINGS ARE TO BE LISTED FOR GROUNDING, A GREEN GROUNDING CONDUCTOR SHALL BE PROVIDED, ALL CONNECTORS ARE TO BE OF A NEMA APPROVED TYPE.

2. FLEXIBLE CONDUIT SHALL BE ACCEPTABLE FOR THE FOLLOWING APPLICATIONS AND SHALL NOT EXCEED 6 FEET IN LENGTH.

- FINAL CONNECTIONS TO OUTLETS ON VIBRATING EQUIPMENT.
- FINAL INTER-CONNECTIONS BETWEEN LIGHT FIXTURES
- FINAL CONNECTIONS WHERE RIGID CONDUIT IS NOT PRACTICAL.

3. THE USE OF ROMEX, BX, ETC. IS NOT PERMITTED.

g. PROVIDE POLY PULL-STRING IN ALL EMPTY CONDUITS.

h. HOME RUNS AND MAIN CONDUIT RUNS ARE TO BE HELD TIGHT TO STRUCTURE ABOVE OR AS REQUIRED TO ALLOW PROPER CLEARANCE OF CEILING AND OTHER TRADES WORK.

i. ALL CONDUITS SHALL BE RUN PARALLEL OR PERPENDICULAR TO COLUMN LINES.

j. ALL CONDUITS MUST BE SIZED PER THE CODE.

k. COMPLETE CONDUIT WORK ABOVE SUSPENDED CEILING SHALL BE PLENUM RATED.

5. OUTLET BOXES

a. UNLESS OTHERWISE NOTED, OUTLET BOXES SHALL BE GALVANIZED PRESSED STEEL, KNOCKOUT TYPE, WITH SUITABLE PLASTER RINGS AND COVERS OR PLATES.

b. UNUSED KNOCKOUT HOLES SHALL REMAIN CLOSED AND THOSE OPENED BY ERROR SHALL BE CLOSED WITH SNAP-IN BLANKS.

c. OUTLET BOXES SHALL NOT BE SMALLER THAN REQUIRED BY CODE FOR THE NUMBER AND SIZE OF WIRES TO BE INSTALLED.

d. OUTLET BOX AND COVE LOCATED ABOVE SUSPENDED CEILING SHALL BE PLENUM RATED.

e. OUTLET BOX MANUFACTURERS SHALL BE APPLETON, GARVIN, RACO (HUBBELL) & STEEL CITY.

6. JUNCTION AND PULL BOXES

a. PROVIDE JUNCTION BOXES, PULL BOXES, CABLE SUPPORTS, AND WIREWAYS AS REQUIRED FOR PROPER INSTALLATION OF THE ELECTRICAL WORK, WHETHER OR NOT SPECIFICALLY SHOWN ON THE DRAWINGS. COVERS SHALL BE ACCESSIBLE. SMALL JUNCTION BOXES SHALL BE SIMILAR TO OUTLET BOXES.

b. PULL BOXES, CABLE SUPPORT BOXES, AND LARGE JUNCTION BOXES FOR INDOOR USE SHALL BE MADE OF CODE GAUGE STEEL. COVERS SHALL BE HELD IN PLACE WITH STAINLESS STEEL SCREWS. PAINT INTERIOR AND EXTERIOR SURFACES WITH RUST-INHIBITIVE PAINT.

c. JUNCTION BOX AND PULL BOX LOCATED ABOVE SUSPENDED CEILING SHALL BE PLENUM RATED.

7. WIRING

a. CONDUCTORS FOR FEEDERS AND BRANCH CIRCUITS SHALL BE COPPER AND THE AWG SIZE AND TYPE AS SHOWN ON DRAWINGS MINIMUM WIRE SIZE SHALL BE #12. THE CONDUCTORS SHALL HAVE 600 VOLT INSULATION, TYPE THWN OR THHN.

b. MINIMUM WIRE SIZE - 20 AMP BRANCH CIRCUIT SHALL BE AWG LISTED SIZE PER DISTANCE SHOWN BELOW. DISTANCE SHALL BE MEASURED FROM THE PANELBOARD CIRCUIT BREAKER TO THE FURTHEST OUTLET.

- #12 LESS THAN 80 FEET. (AT 120V)
- #10 OVER 80 FEET. (AT 120V)

c. CONDUCTORS SHALL BE STRANDED FOR SIZES #10AWG AND LARGER.

d. ALUMINUM CONDUCTORS ARE NOT PERMITTED.

e. ALL WIRING SHALL BE IN CONDUIT.

f. WIRE CONNECTORS SHALL BE EQUAL TO "SCOTCH LOCK" FOR #10 AWG WIRE AND SMALLER AND EQUAL TO T & B "LOCKTIGHT" FOR #6 AWG AND LARGER. EQUALS BY BUCHANAN OR IDEAL ARE ACCEPTABLE.

g. ALL WIRING TO BE COLOR-CODED AS FOLLOWS:

120/208 VOLT SYSTEM

NEUTRAL - WHITE
PHASE A OR L1 - BLACK
PHASE B OR L2 - RED
PHASE C OR L3 - BLUE
GROUND - GREEN

8. GROUNDING

PROVIDE COMPLETE WIRE GROUNDING CONDUCTOR SYSTEM, #12 AWG MINIMUM, SIZED AND INSTALLED IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE CODE.

a. ALL DEVICES SHALL BE BONDED TO THE CONDUIT SYSTEM. USE A BONDING JUMPER BETWEEN THE OUTLET BOX AND THE DEVICE GROUNDING TERMINAL. METAL-TO-METAL CONTACT BETWEEN THE DEVICES YOKS AND THE OUTLET BOX IS NOT ACCEPTABLE AS A BOND FOR EITHER SURFACE MOUNTED BOXES OR FLUSH TYPE BOXES. ALL JUNCTION BOXES, OUTLET BOXES AND PULL BOXES SHALL BE BONDED TO THE CONDUIT SYSTEM. ALL CONDUIT, INCLUDING FLEXIBLE CONDUIT, SHALL BE GROUNDED WITH GREEN GROUNDING CONDUCTOR.

b. ALL ENCLOSURES AND NON-CURRENT CARRYING METAL PARTS ARE TO BE GROUNDED. CONDUIT SYSTEM IS TO BE ELECTRICALLY CONTINUOUS. ALL LOCK NUTS MUST CUT THROUGH ENAMELED OR PAINTED SURFACES ON ENCLOSURES, WHERE ENCLOSURES AND NON-CURRENT CARRYING METAL PARTS ARE ISOLATED FROM THE CONDUIT SYSTEM. USE BONDING JUMPERS WITH APPROVED CLAMPS. ALL GROUND CLAMPS SHALL BE "PENN-UNION" OR EQUAL, SIMILAR TO "GPI" TYPE.

c. NO OTHER CIRCUITS ARE TO BE RUN IN SAME CONDUIT FEEDING ISOLATED GROUND RECEPTACLES.

9. SLEEVES

a. THE CONTRACTOR SHALL PROVIDE SLEEVES TO PROTECT EQUIPMENT OR FACILITIES IN THE INSTALLATION. EACH SLEEVE SHALL EXTEND THROUGH ITS RESPECTIVE FLOOR, WALL OR PARTITION AND SHALL BE CUT FLUSH WITH EACH SURFACE EXCEPT SLEEVES THAT PENETRATE THE FLOOR, WHICH SHALL EXTEND 2" ABOVE THE FLOOR.

b. UNLESS OTHERWISE NOTED, ALL SLEEVES AND OPENINGS THROUGH FIRE RATED WALLS SHALL BE FIRE SEALED WITH CALCIUM SILICATE, SILICONE "RTV" FOAM, "3M" FIRE RATED SEALANTS OR EQUAL, SO AS TO RETAIN THE FIRE RATING OF THE FLOOR OR WALL. CONFORM TO UL ASSEMBLY RATING OF FLOOR OR WALL.

c. SLEEVES IN BEARING AND MASONRY WALLS' FLOORS AND PARTITIONS SHALL BE STANDARD WEIGHT BLACK STEEL PIPE FINISHED WITH SMOOTH EDGES. FOR OTHER THAN MASONRY PARTITIONS, THROUGH SUSPENDED CEILINGS, OR FOR CONCEALED VERTICAL CONDUIT, SLEEVES SHALL BE NO. 22.

10. TESTING AND INSPECTION

a. THE ELECTRICAL CONTRACTOR SHALL THOROUGHLY TEST THE ENTIRE ELECTRICAL SYSTEM FOR GROUNDS, SHORTS AND PROPER GROUNDING RESISTANCE. A MAXIMUM OF 25 OHMS RESISTANCE FROM NEUTRAL CONDUCTOR AND CONDUIT TO EARTH GROUND SHALL BE PERMITTED. ONLY A GROUND RESISTANCE MEASURING METER OF APPROVED TYPE SHALL BE USED. A COMMON OHM METER IS NOT ACCEPTABLE.

b. THE ELECTRICAL CONTRACTOR SHALL SEE THAT LOCAL INSPECTION AUTHORITIES ARE NOTIFIED WHEN INSPECTIONS ARE REQUIRED BY CODE AND SHALL GIVE ALL NECESSARY ASSISTANCE TO THE INSPECTOR WHEN HE IS MAKING AN INSPECTION.

c. THE ELECTRICAL CONTRACTOR WILL SATISFY ALL REGULATIONS HAVING JURISDICTION ON THIS PROJECT.

11. WIRING DEVICES

a. THIS CONTRACTOR SHALL FURNISH AND INSTALL SWITCHES AND RECEPTACLES AS SHOWN ON THE DRAWINGS AND NECESSARY FOR A COMPLETE INSTALLATION. COLOR OF DEVICES AND PLATES SHALL BE AS DIRECTED BY ARCHITECT. THE DEVICES SHALL BE OF THE TYPES AND RATINGS LISTED, OR EQUALS BY PASS & SEYMOUR, HUBBELL OR LEVITON. WEATHERPROOF GFI RECEPTACLES SHALL BE INSTALLED WHERE SHOWN ON DRAWINGS OR AS REQUIRED BY CODE.

1. TOGGLE SWITCHES: 20A-120V COMMERCIAL SPECIFICATION GRADE
2. DUPLEX RECEPTACLES: 20A-125V COMMERCIAL SPECIFICATION GRADE
3. GROUND FAULT CIRCUIT INTERRUPTING RECEPTACLE: 20A-125V, 5MA, COMMERCIAL SPECIFICATION GRADE

12. WALL PLATES

a. WALL PLATES SHALL BE AS SPECIFIED BY OWNER. WHERE STANDARD PLATES WILL NOT FIT WALL FINISH, UNPLASTERED BRICK OR SPECIAL FINISH WALLS, USE SPECIAL SIZE PLATES TO SUIT CONDITIONS. ALL WALL PLATES LINE UP AND FLUSH WITH MOUNTING SURFACE AND SECURELY ATTACHED IN PLACE.

b. WHERE SWITCHES, RECEPTACLES OR COMBINATIONS THEREOF ARE GROUNDING, USE GANG PLATES AND OUTLET BOXES TO SUIT THE SPECIFIC ARRANGEMENTS.

c. VERIFY MOUNTING HEIGHTS OF WIRING DEVICES WITH ARCHITECT/OWNER. IN GENERAL, RECEPTACLES 15" ABOVE FLOOR OR 4.5' ABOVE COUNTER TOP WHERE COUNTERS OCCUR, AND SWITCHES 4'-0" ABOVE FLOOR, EXCEPT WHERE SPECIFIC HEIGHTS ARE INDICATED. SPECIAL RECEPTACLE LOCATED AS DIRECTED BY ARCHITECT AND ENGINEER.

d. WALL PLATES SHALL BE OF THE SAME MANUFACTURER AS WIRING DEVICE.

13. LIGHTING FIXTURES & LAMPS:

a. THIS CONTRACTOR SHALL FURNISH ADDITIONAL AUXILIARY SUPPORTING STEEL HANGER WIRES ADEQUATELY SIZED TO SUPPORT THE WEIGHT OF THE FIXTURE AND FASTENED TO BUILDING STRUCTURE (MINIMUM TWO PER FIXTURE) FOR FIXTURES NOT MOUNTED ON BUILDING FRAMEWORK. FIXTURES SHALL NOT BE SUPPORTED SOLELY BY THE CEILING STRUCTURE.

b. PROVIDE APPLICABLE FIRE RATED DRYWALL BOXES OVER RECESSED FIXTURES IN FIRE RATED CEILINGS AS REQUIRED BY CODES. FIELD COORDINATE AS REQUIRED TO AVOID CONFLICT.

c. THIS CONTRACTOR SHALL PROVIDE ANY NECESSARY FITTINGS, ACCESSORIES, ETC. AS NECESSARY TO MAKE A COMPLETE INSTALLATION.

d. REMOVE ALL DIRT, OIL OR GREASE FROM LIGHT FIXTURES. CLEAN ALL GLASS, LENSES, ETC. AND POLISH FIXTURES AND TRIM.

14. IDENTIFICATION

a. PROVIDE TYPED DIRECTORIES IN PANELBOARDS TO DEPICT ACTUAL EQUIPMENT CONNECTED TO INDIVIDUAL BREAKERS/SWITCHES.

15. SHOP DRAWINGS AND SUBMITTALS:

a. SUBMIT COMPLETE SHOP DRAWINGS FOR MANUFACTURED EQUIPMENT. CLEARLY MARK SUBMISSIONS FOR LIGHTING FIXTURES WITH THE TYPE, LETTER OR LETTERS ASSIGNED TO EACH FIXTURE IN THE FIXTURES SCHEDULE AND INCLUDE A GRAPH SHOWING TYPICAL LIGHT DISTRIBUTION AND A TABLE OF CERTIFIED UTILIZATION FACTORS. ALL FIXTURE SUBMITTALS SHALL BE IN BROCHURE FORM.

b. PROVIDE SUFFICIENT INFORMATION AND DATA REQUIRED FOR THE ARCHITECT TO REASONABLY DETERMINE PROPER COMPLIANCE WITH THE SPECIFICATIONS.

c. IN ADDITION, THE CONTRACTOR SHALL SUBMIT A COMPLETE LIST OF MATERIALS PROPOSED, GIVING THE MANUFACTURER'S NAME, CATALOG NUMBER, OR OTHER MEANS OF IDENTIFICATION TO SHOW COMPLIANCE WITH THESE SPECIFICATIONS.

d. REVIEW OF SHOP DRAWINGS IS RENDERED AS A SERVICE ONLY, AND SHALL NOT BE CONSIDERED AS A GUARANTEE OF MEASUREMENTS OR BUILDING CONDITIONS, NOR SHALL IT BE CONSTRUED AS RELIEVING THE CONTRACTOR OF BASIC RESPONSIBILITY UNDER THE CONTRACT. SHOP DRAWINGS SHALL BE SUBMITTED ON, BUT NOT BE LIMITED TO THE FOLLOWING SYSTEMS: LIGHT FIXTURE BALLASTS AND ALL ASSOCIATED LIGHT FIXTURES HARDWARE, WIRING DEVICES, COVER PLATES, PANELS, BEAKERS, DATA/VOICE JACKS, CABLE, FIRE ALARM DEVICES, ETC.

16. INSTALLATION OF EQUIPMENT FURNISHED BY OTHERS

a. CONTRACTOR SHALL INSTALL ALL EQUIPMENT, WIRE AND CABLE FURNISHED TO HIM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL INSTALLATION DRAWINGS AND WIRING DIAGRAMS FROM THE EQUIPMENT MANUFACTURER. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

b. CONTRACTOR SHALL MAKE FINAL CONNECTIONS AND TERMINATIONS TO THE OWNER, MECHANICAL, AND PLUMBING CONTRACTOR'S FURNISHED EQUIPMENT.

17. SPECIAL SYSTEMS

TELEPHONE/DATA SYSTEM: ELECTRICAL CONTRACTOR SHALL INSTALL CONDUITS, OUTLET BOXES, AND CABLE. G.C. IS RESPONSIBLE FOR COORDINATION BETWEEN ALL SUB CONTRACTORS AND IS ULTIMATELY RESPONSIBLE FOR ACCURATELY DICTATING THE SCOPE BETWEEN SUB CONTRACTS.

18. OCCUPANCY SENSORS

a. CONTRACTOR'S WORK TO INCLUDE ALL LABOR, MATERIALS, TOOLS, APPLIANCES, CONTROL HARDWARE, SENSOR, WIRE, JUNCTION BOXES AND EQUIPMENT NECESSARY FOR AND INCIDENTAL TO THE DELIVERY, INSTALLATION AND FURNISHING OF A COMPLETELY OPERATIONAL OCCUPANCY SENSOR LIGHTING CONTROL SYSTEM, AS DESCRIBED HEREIN.

b. WALL SWITCH PRODUCTS MUST BE CAPABLE OF WITHSTANDING THE EFFECTS OF INRUSH CURRENT.

c. WALL SWITCH SENSORS SHALL BE CAPABLE OF DETECTION OF OCCUPANCY AT DESKTOP LEVEL UP TO 300 SQUARE FEET, AND GROSS MOTION UP TO 1000 SQUARE FEET.

d. WALL SWITCH SENSORS SHALL ACCOMMODATE LOADS FROM 0 TO 800 WATTS AT 120 VOLTS, 0 TO 1200 WATTS AT 277 VOLTS.

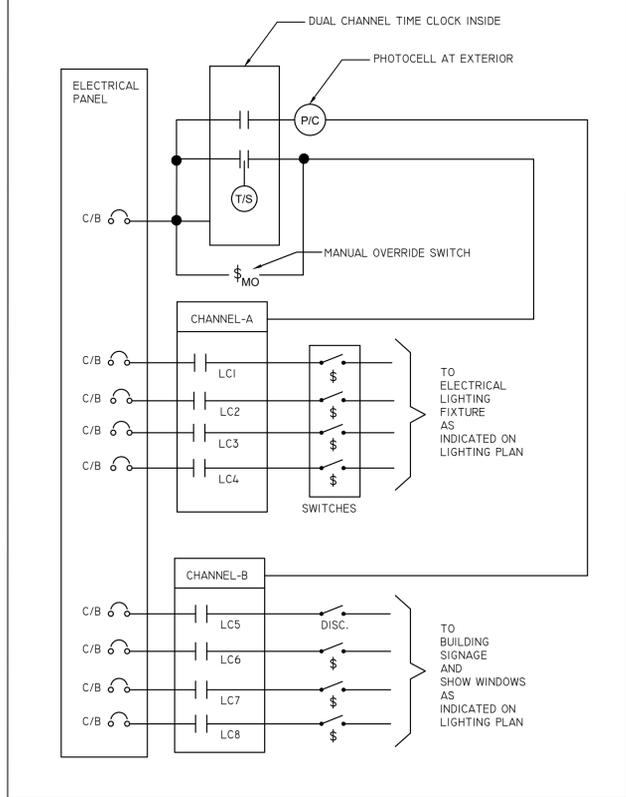
e. ALL SENSORS SHALL BE CAPABLE OF OPERATING NORMALLY WITH ELECTRONIC BALLASTS, PL LAMP SYSTEMS AND RATED MOTOR LOADS.



- LIGHTING PLAN GENERAL NOTES:**
- OCCUPANCY SENSORS SHALL BE WIRED UPSTREAM OF LOCAL SWITCHING UNLESS NOTES OTHERWISE. ALL THE SENSORS IN ROOM/AREA SHALL OPERATE PARALLEL.
 - PROVIDE POWER PACK FOR CONTROLLED RECEPTACLES (1 POWER PACK PER CIRCUIT) REFER FLOOR PLAN.
 - ALL COMMON CORRIDOR LIGHTING ON EACH FLOOR SHALL BE CONTROLLED AS ONE ZONE VIA OCCUPANCY SENSORS. CORRIDOR LIGHTING SHALL HAVE 2 LEVELS OF AUTOMATED DIMMING - 50% AFTER 30 MINS OF NO OCCUPANCY AND TURN OFF AFTER 1 HOUR OF NO OCCUPANCY
 - CONTRACTOR NEED TO COORDINATE LIGHT FIXTURE LOCATIONS AND INSTALLATION WITH MECHANICAL EQUIPMENT.
 - CONTRACTOR IS ADVISED THAT ADJUSTMENTS TO EMERGENCY AND EXIT LIGHT FIXTURE LOCATIONS/QUANTITIES MAY BE REQUIRED BY AHJ UPON FINAL INSPECTION.
 - ALL NIGHT LIGHT, EMERGENCY AND EXIT LIGHT FIXTURES SHALL BE CONNECTED AHEAD OF SWITCHED LIGHTING CIRCUIT.
 - UNLESS OTHERWISE NOTED, LIGHT SWITCHES SHALL BE GANGED TOGETHER UNDER A COMMON FACEPLATE.
 - RECESSED FIXTURES ARE INSTALLED IN FIRE CEILINGS, PROVIDE FIRE RATED BOX OR ENCLOSURE.

- LIGHTING PLAN KEYED NOTES:**
- DIMMER/LV SWITCH BANK AND LIGHTING CONTROL PANEL LIGHTING OVERRIDE SWITCH AT THIS LOCATION. COORDINATE EXACT LOCATION OF SWITCH BANK WITH ARCHITECT/OWNER.
 - NOT USED.
 - PROVIDE JUNCTION BOX FOR WALK-IN FREEZER/COOLER LIGHTING. COORDINATE WITH MANUFACTURER FOR EXACT LOCATIONS.
 - WALL MOUNTED OCCUPANCY SENSOR. SET OFF TIME TO 15 MINUTES FOR RESTROOM, SET DIP SWITCH TO AUTOMATIC ON.
 - WIRE ALL EMERGENCY, EXIT AND NIGHT LIGHT AHEAD OF SWITCHING FOR CONTINUOUS OPERATIONS. CONNECT TO ADJACENT LIGHTING CIRCUIT.
 - JUNCTION BOX FOR THE EXTERIOR SIGNAGE CONTROLLED WITH TIME CLOCK. E.C SHALL VERIFY THE EXACT LOCATION WITH ARCHITECT/OWNER.
 - COORDINATE EXACT LOCATION OF TIME CLOCK WITH ARCHITECT/OWNER.
 - EXTERIOR LIGHTING SHALL BE CONNECTED TO THE INDICATED CIRCUIT VIA "LIGHTING CONTROL PANEL". VERIFY THE FIXTURE OPERABLE CONDITION AND CONTROL WITH ARCHITECT/OWNER.

- LIGHTING CONTACTORS (LC) TYPICAL DETAIL**
- LIGHTING CONTACTOR (LC) PANEL SHALL BE LOCATED NEAR THE ELECTRICAL PANEL.
 - PROVIDE DUAL CHANNEL TIME CLOCK (TC), LOCATE NEAR PANEL.
 - PROVIDE MANUAL OVERRIDE SWITCH (MO) LOCATE NEAR PANEL.
 - PROVIDE PHOTOCELL (PC) LOCATE AT EXTERIOR OF THE BUILDING.
 - DIAGRAM BELOW INDICATES THE GENERAL ARRANGEMENT OF THE CONTACTOR PANEL. SEE ELECTRICAL LIGHTING PLAN FOR CIRCUIT AND CONTROL DETAILS. CONTRACTOR SHALL SELECT THE QUANTITY OF THE CONTACTORS AS REQUIRED.



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

LIGHTING FIXTURE SCHEDULE						
TAG	SYMBOL	DESCRIPTION	MANUFACTURER	MODEL	TYPE	WATTAGE
L7	□	2X2 RECESSED LED PANEL LIGHT	LITHONIA	CPX LED	LED	31W*
L2	◇	6" RECESSED CAN DOWNLIGHT	LITHONIA	LDN6	LED	17.5W
L3	⊕	WALL SCONCE LIGHT	REJEVENATION	GALAXY SINGLE SCONCE	LED	60W
EX	⊗	EXIT SIGN-WALL MOUNTED	LITHONIA	LQM-S-W-3-R-ELN-SD	LED	0.62W
EM	⚡	EMERGENCY EGESS LIGHT	LITHONIA	ELM4L	LED	3.15W

- LIGHT FIXTURE SCHEDULE GENERAL NOTES:**
- VERIFY ALL LUMINAIRE COLORS, TRIMS, LENGTHS, ETC. WITH THE ARCHITECT PRIOR TO PLACING FINAL PURCHASE ORDERS. SUBMISSION PF SHOP DRAWINGS WILL BE INTERPRETED AS HAVING BEEN COORDINATED WITH THE ARCHITECTURAL DRAWINGS .
 - PROVIDE ALL LENGTHS, FEEDS, ACCESSORIES, CONNECTORS, WIRING, POWER SUPPLIES, DRIVERS ETC. FOR A COMPLETE INSTALLATION. THE E.C. SHALL VERIFY THE COMPLETE BILL OF MATERIAL WITH MANUFACTURER'S REPRESENTATIVE AND ENSURE ALL EQUIPMENT ARE INCLUDED IN BID PRICE. COORDINATE INSTALLATION WITH ARCHITECTURAL DETAILS.
 - VERIFY FINAL LUMINAIRE LOCATIONS WITH OTHER CEILING MOUNTED EQUIPMENTS SUCH AS DIFFUSER WITH ARCHITECTURAL REFLECTED CEILING PLANS.
 - VERIFY EXACT MOUNTING HEIGHT AND LOCATIONS OF ALL WALL MOUNTED LUMINAIRE WITH ARCHITECTURAL PLANS AND ELEVATIONS PRIOR TO ROUGH-IN.
 - ANY PROPOSED ALTERNATE LUMINAIRES SHALL BE APPROVED BY THE ARCHITECT PRIOR TO FINAL BID PRICING.
 - SHOULD THE CONTRACTOR PROPOSE TO FURNISH MATERIALS, EQUIPMENT AND DEVICES OTHER THAN THOSE SPECIFIED AND LISTED, THE CONTRACTOR SHALL SUBMIT A WRITTEN REQUEST FOR SUBSTITUTIONS, TO THE ENGINEERS AT LEAST TEN (10) BUSINESS DAYS PRIOR TO BID OPENING. THE REQUEST SHALL BE AN ALTERNATE TO THE ORIGINAL BID AND SHALL INCLUDE A COMPLETE SPECIFICATIONS CUTSHEET SUBMITTAL AS OUTLINED IN THE SPECIFICATIONS, COMPLETE WITH DESCRIPTIVE (MANUFACTURER, BRAND NAME, CATALOG NUMBER, ETC.) AND TECHNICAL DATA FOR ALL ITEMS. INDICATE ANY ADDITIONS OR DEDUCTIONS TO THE CONTRACT PRICE WITH THE SUBSTITUTION SUBMITTAL AND ON THE BID FORM.
 - VERIFY FINAL SELECTION OF LIGHT FIXTURES WITH ARCHITECT.
 - EMERGENCY LIGHT FIXTURE SHALL MINIMUM 90MIN BACKUP.



Electrical Schedule			
Item Number	Count	Equipment Description	Connection Description
113	1	Soft Serve Machine	High Voltage Outlet
117	1	Printer	Pwr & Data
121	1	Refrigerator, Worktop	Dedicated Outlet
122	1	Mixer, Drink/Bar	Dedicated Outlet
125	1	Heated Holding Shelf	Dedicated Outlet
136	1	Direct	JBox WM
137	1	Carbonator	Dedicated Outlet
141	1	Beverage Dispenser, Electric	Dedicated Outlet
143	1	Monitor	Pwr & Data
205	1	Cheesemelter, Electric	Dedicated Outlet
205	1	Cheesemelter, Electric	Dedicated Outlet
206	1	Hot Food Well Unit, Drop-In, Electric	JBox WM
206	1	Hot Food Well Unit, Drop-In, Electric	JBox WM
207	1	Sandwich/Salad Preparation Refrigerator	Dedicated Outlet
207	1	Sandwich/Salad Preparation Refrigerator	Dedicated Outlet
211	1	Monitor	Pwr & Data
211	1	Monitor	Pwr & Data
214	1	Toaster, Contact Grill, Conveyor Type	High Voltage Outlet
216	1	Reach-In Freezer	Dedicated Outlet
221	1	Monitor	Pwr & Data
223	1	Fryer Dump Station	JBox WM
225	1	Fryer Battery, Gas	Dedicated Outlet
226	1	Type 1 Exhaust Hood	JBox
226.1	1	MUA	JBox
226.2	1	Exhaust Fan	JBox
229	1	Food Pan Warmer, Countertop	Dedicated Outlet
232	1	Equipment Stand, Refrigerated Base	Dedicated Outlet
234	1	Multiple Fryer System, Gas	Dedicated Outlet
235	1	Mega Top Sandwich/Salad Preparation Refrigerator	Dedicated Outlet
236	1	Monitor	Pwr & Data
306	1	Dishwasher	JBox WM
315	1	Nugget Ice Maker	JBox WM
323	1	Walk-In Cooler Door	JBox
323.1	1	Evaporator Coil (Refrigerator)	JBox
324	1	Walk-In Freezer Door	JBox
324.1	1	Evaporator Coil (Freezer)	JBox
325	1	Cooler Condenser	JBox
325.1	1	Cooler Condenser	JBox
411	1	Oil Management System	Dedicated Outlet
412	1	Oil Management System	Dedicated Outlet
413	1	Dipslick	Dedicated Outlet
414	1	Air Curtain	JBox WM
501	1	Monitor	Pwr & Data
516	1	Soda Dispenser	JBox WM
517	1	Carbonator	Dedicated Outlet
C48	1	Duplex Convenience Outlet	Duplex Outlet
C48	1	Duplex Convenience Outlet	Duplex Outlet
C55	1	Duplex Convenience Outlet	Duplex Outlet
C55	1	Duplex Convenience Outlet	Duplex Outlet
POS	1	POS System	Pwr & Data
POS	1	POS System	Pwr & Data
POS	1	POS System	Pwr & Data
PS	1	Pull Station	JBox WM
PTR	1	Printer	Pwr & Data
PTR	1	Printer	Pwr & Data
PTR	1	Printer	Pwr & Data
PTR	1	Printer	Pwr & Data
PTR	1	Printer	Pwr & Data
QCO	1	Quad Convenience Outlet	Quadplex Outlet
WH	1	Water Heater	JBox WM

ELECTRICAL POWER PLAN SCALE 1/4"=1'-0" 2

- ELECTRICAL POWER PLAN GENERAL NOTES:**
- ALL BRANCH CIRCUITS HOMERUNS ASSIGN INDICATED ON THIS PLAN SHALL BE CIRCUITED TO THERE RESPECTIVE PANELS, CIRCUIT NUMBER INDICATED, U.O.N.
 - E.C. SHALL VERIFY ALL CONNECTION REQUIREMENT FOR ALL EQUIPMENT AND COORDINATE NEMA PLUG CONFIGURATION FOR EQUIPMENT.
 - ALL RECEPTACLE IN KITCHEN AND WITHIN 6' OF A SINK SHALL BE GFCI RATED.
 - ALL EXTERIOR DISCONNECTS AND ELECTRICAL EQUIPMENT SHALL BE NEMA 3R RATING.
 - E.C. PROVIDE GROUNDING IN ACCORDANCE WITH NEC 250. PROVIDE A #6 CU GROUND TO ANY NEW METAL GAS PIPING SYSTEM.
 - REFER TO DWG. E001 FOR ELECTRICAL GENERAL NOTES, SYMBOL LIST & ABBREVIATIONS.
 - REFER TO DWG. E002 & E003 FOR ADDITIONAL ELECTRICAL SPECIFICATIONS.
 - FINAL CONNECTION TO ALL HARD WIRED EQUIPMENT SHALL BE MADE WITH LIQUID TIGHT FLEXIBLE CONDUIT.
 - E.C. SHALL FURNISH AND INSTALL DISCONNECT SWITCHES, CONDUIT AND WIRE FOR EQUIPMENT. INSTALL UNDER SUPERVISION OF EQUIPMENT SUPPLIER.
 - CONTRACTOR TO VERIFY SCOPE OF WORK WITH OWNER. PRIOR TO BID.

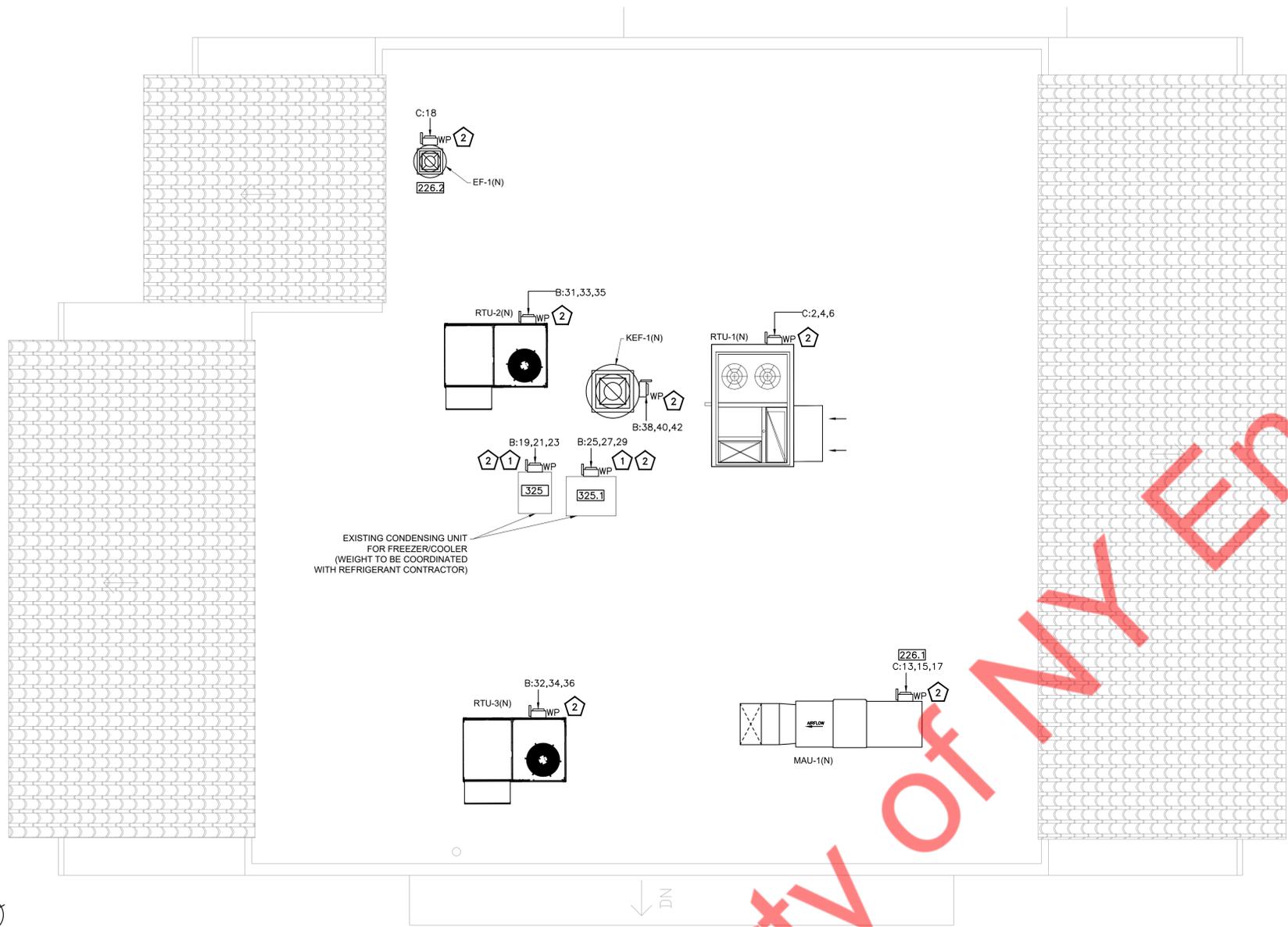
- POWER KEYED WORK NOTES:**
- KEEP 3 FEET CLEARANCE IN FRONT OF ELECTRICAL EQUIPMENT PER NEC CODE REQUIREMENTS.
 - PROVIDE JUNCTION BOX FOR WALK-IN FREEZER/COOLER EQUIPMENT. COORDINATE WITH MANUFACTURER FOR EXACT LOCATIONS.
 - PROVIDE BOX ROUGH-IN FOR MANUAL ACTIVATION OF ANSUL FIRE SUPPRESSION SYSTEM AND HOOD CONTROL PANEL. TIE INTO BUILDING FIRE ALARM SYSTEM. CONFIRM LOCATION WITH LOCAL AHJ. PULL STATION SHALL PROVIDE BY FIRE ALARM CONTRACTOR CONFIRM LOCATION AND REQUIREMENT.
 - PROVIDE JUNCTION BOX FOR WALK-IN BOX DOOR HEATER AND MISCELLANEOUS LOADS. EC SHALL COORDINATE WITH VENDOR FOR EXACT POWER REQUIREMENT.
 - E.C. SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR/DRAWINGS FOR THE EXACT LOCATION OF THE MECHANICAL UNITS IN THE FIELD. PROVIDE CIRCUIT AND CONTROL AS REQUIRED.
 - PROVIDE JUNCTION BOX TO RCP. EC SHALL COORDINATE WITH PLUMBING CONTRACTOR.
 - PROVIDE JUNCTION BOX TO EXISTING GAS WATER HEATER. EC SHALL COORDINATE WITH PLUMBING CONTRACTOR FOR EXACT LOCATION AND POWER REQUIREMENT. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
 - EC SHALL COORDINATE WITH OWNER/ARCHITECT FOR EXACT LOCATION OF PANEL IN THE FIELD.
 - PROVIDE JUNCTION BOX TO HOOD. EC SHALL COORDINATE WITH OWNER/ARCHITECT.
 - PROVIDE CEILING MOUNTED RECEPTACLE FOR SHOW WINDOW AS REQUIRED BY CODE. VERIFY WITH LOCAL ENERGY AGENCY. VERIFY EXACT LOCATION WITH ARCHITECT. RECEPTACLES SHALL BE CONTROLLED THROUGH LIGHTING CONTROL PANEL AND PHOTOCELL.
 - E.C. SHALL COORDINATE WITH THE ARCHITECT/UTILITY/OWNER FOR EXACT LOCATION OF THE CT CABINET, METER AND SERVICE DISCONNECT SWITCH IN THE FIELD.

ELECTRICAL LEGEND		
Plan	Elevation	Description
		120V Dedicated: Single, Duplex & Quadplex Outlet
		120V Duplex Drop Cord
		Outlet
		High Voltage Outlet 208-480V
		J-Box Fixture Mounted & Wall Mounted
		Duplex Outlet w/ Data Point
		Electrical Stub-Up
		Electrical Connection Point
		Fire Pull Station To Be Verified By Fire Inspector
		Light Switch
		Light Fixture
		Electrical Disconnect Point
		Thermostat
		Blower Fixture Mounted
		Alarm Connection Point
		Electrical Lines

SHEET TITLE: ELECTRICAL POWER PLAN

SHEET:

E-200



ELECTRICAL ROOF PLAN GENERAL NOTES:

- ALL ROOF PENETRATION MUST BE PATCHED IN BY DIVERSIFIED ROOFING. THERE SHALL BE NO SURFACE MOUNTING OF THE ELECTRICAL UNITS ON ROOF.
- E.C. SHALL VERIFY EXISTING ELECTRICAL CONNECTIONS, WIRE SIZES AND OPERABLE CONDITION OF THE ALL ELECTRICAL DEVICES OF THE EXISTING MECHANICAL UNITS THAT SHALL REMAIN.

ROOF POWER KEYED NOTES:

- E.C. SHALL VERIFY THE EXACT LOCATION AND OPERABLE CONDITION OF THE EXISTING MECHANICAL UNITS IN THE FIELD AND PROVIDE THE ELECTRICAL SUPPLY.
- ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. COORDINATE LOCATION OF DISCONNECT WITH OWNER AND MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.

ELECTRICAL ROOF PLAN SCALE
1/4"=1'-0" 3

Property of NY Engineering



PIPING MATERIALS	
CONDITION / LOCATION	MATERIAL TYPE
ABOVE GROUND WATER	TYPE "L" COPPER
BELOW GROUND WATER	TYPE "K" COPPER
WASTE	CAST IRON PIPE
WASTE ALTERNATIVE *	SCH. 40 PVC PLASTIC
VENT (UNDERGROUND)	CAST IRON
VENT (ABOVEGROUND)	CAST IRON
GAS PIPING	SCH. 40 BLACK STEEL
CONDENSATE PIPING	SCHED. 40 PVC PLASTIC

NOTE : PVC IS NOT PERMITTED IN PLENUMS, USE STEEL PIPE OR PVC FIRE WRAP.

* ALTERNATIVE PIPE MATERIAL REQUIRES OWNER'S APPROVAL PRIOR TO ORDERING.

PLUMBING PLAN NOTATIONS	
POINT TO NEW CONNECTION	
POINT TO DEMOLITION	
EXISTING TO REMAIN	(E)
EQUIPMENT MARK AND NUMBER, SEE SCHEDULE	WH-1

PIPING FITTINGS & VALVES SYMBOLS	
DROP	
RISE	
TEE	
CAP	
FLOW ARROW	
PUMP	
GLOBE VALVE	
PLUG VALVE	
SOLENOID VALVE	
GAS PRESSURE REGULATOR	
PRESSURE REDUCING VALVE	
GAS SHUTOFF VALVE	
REDUCED PRESSURE BACKFLOW PREVENTER	
BALL VALVE	
CHECK VALVE	
BALANCE VALVE	
STRAINER	
UNION	
TEMPERATURE & PRESSURE RELIEF VALVE	
METER	
PIPE SLEEVE	
WATER HAMMER ARRESTOR	
PRESSURE/TEMPERATURE TEST PLUG	
AQUASTAT	
WALL HYDRANT OR HOSE BIBB	
CLEANOUT	
CLEANOUT AT FLOOR OR AT GRADE	
FLOOR OR AREA DRAIN	

PLUMBING SYMBOL LIST	
DOMESTIC HOT WATER	
DOMESTIC COLD WATER	
DOMESTIC HOT WATER RETURN	
SANITARY	
GREASE WASTE	
VENT	
NATURAL GAS	

SEISMIC NOTES	
1.	CONTRACTOR SHALL PROVIDE COMPLETE SEISMIC ANCHORAGE AND BRACING FOR ALL REQUIRED EQUIPMENT.
2.	CONTRACTOR SHALL COMPLY WITH THE SUPPORT AND ANCHORAGE OF EQUIPMENT AS SHOWN ON DRAWINGS. IF THERE IS NO ANCHORAGE DETAIL SHOWN ON THE DRAWINGS, SUBMIT SHOP DRAWINGS IF THE FOLLOWING APPLY:
2.1.	EQUIPMENT WITH AN OPERATING WEIGHT OVER 40 POUNDS AND IS MOUNTED DIRECTLY ON THE FLOOR OR ROOF.
2.2.	EQUIPMENT WITH AN OPERATING WEIGHT OVER 20 POUNDS AND IS SUSPENDED FROM THE CEILING, STRUCTURE, ROOF, FLOOR, OR WALL OR IS SUPPORTED BY SPRING ISOLATION DEVICES.
2.3.	THE CONTRACTOR SHALL SUBMIT THE ANCHORAGE DETAILS AND CALCULATIONS FOR ITEMS NOT SHOWN ON THE DRAWINGS AND FOR ALL SUBSTITUTED EQUIPMENT THAT IS GREATER IN WEIGHT OR VARIES MORE THAN 10% IN LENGTH.
3.	THE CALCULATIONS AND DETAIL SUBMITTALS SHALL BE SEALED AND SIGNED BY A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA. THE CALCULATIONS SHALL DEMONSTRATE THE FOLLOWING:
3.1.	THE ADEQUACY OF ANCHORAGE UNDER ALL APPLICABLE LOAD CONDITIONS PRESCRIBED BY THE UNIFORM BUILDING CODE.
3.2.	THE STRUCTURAL ELEMENTS, WHICH ARE RESISTING THE ANCHORAGE LOADS; SUCH AS CONCRETE FILL ON METAL DECK AND/OR STEEL BEAMS, ARE NOT STRESSED BEYOND ITS ACCEPTABLE VALUE.
4.	FOR ALL VIBRATION ISOLATORS AND THEIR ANCHORAGES, THE CONTRACTOR SHALL PROVIDE CALCULATIONS, DETAILS AND TEST DATA TO SUBSTANTIATE THE ISOLATOR'S CAPACITY FOR VERTICAL AND LATERAL LOADS. CALCULATIONS MUST ALSO BE SUBMITTED TO SUBSTANTIATE THE SIZE, QUANTITY, LOCATION AND CONNECTION TO STRUCTURE. THE DRAWINGS MUST BE MADE CONSISTENT WITH THE CALCULATIONS. THE MANUFACTURER, EQUIPMENT AND STRUCTURAL ATTACHMENT PROCEDURE MUST BE CLEARLY SPECIFIED. ISOLATORS WHICH SUPPORT A COMPONENT INSIDE THE ACTUAL UNIT WILL NOT BE REVIEWED.
5.	WHERE CONCRETE AND MASONRY EXPANSION OR ADHESIVE TYPE ANCHORS ARE USED, THE ANCHORAGE DETAILS AND CALCULATIONS SHALL INDICATE THE MANUFACTURER, ICBO REPORT NO., TYPE, DIAMETER, MINIMUM EMBEDMENT, CONCRETE TYPE AND STRENGTH.
6.	WHEN INSTALLING DRILLED-IN ANCHORS IN EXISTING NON-PRESTRESSED REINFORCED CONCRETE, USE CARE AND CAUTION TO AVOID CUTTING OR DAMAGING THE EXISTING REINFORCING BARS. LOCATE REINFORCEMENT BY USING A NON-DESTRUCTIVE METHOD PRIOR TO INSTALLATION. MAINTAIN A MINIMUM CLEARANCE OF ONE INCH BETWEEN THE REINFORCEMENT AND THE DRILLED-IN ANCHOR AND/OR PIN.
7.	NO POWER DRIVEN FASTENERS AND/OR SHOT PINS ARE ALLOWED FOR HANGING EQUIPMENT, DUCTWORK AND PIPING SYSTEMS.
8.	ALL EXPANSION ANCHORS SHALL HAVE 50% OF THE BOLTS TESTED. IF ANY ANCHOR FAILS TESTING, TEST ALL ANCHORS OF THE CATEGORY NOT PREVIOUSLY TESTED UNTIL 20 CONSEQUENT PASS, THEN RESUME THE MINIMAL TESTING FREQUENCY. TESTING SHALL OCCUR 24 HOURS MINIMUM AFTER INSTALLATION OF THE SUBJECT ANCHORS, IN ACCORDANCE WITH IR19-1.
9.	FOR ANCHORAGE USE RED HEAD THRU BOLTS ICC ESR-2427 OR HILTI KWIK BOLT 3 WEDGE ANCHORS ICC ESR-1985.
10.	THE SEISMIC ANCHORAGE OF PLUMBING EQUIPMENT SHALL CONFORM TO 2022 CBC SECTIONS 1615A.1.21 AND 1616A.1.22.

ABBREVIATIONS	
ABV- ABOVE	H.B. - HOSE BIBB
ACC- ACCESSIBLE	HW - HOT WATER
AFF- ABOVE FINISH FLOOR	HWR - HOT WATER RETURN
AFG- ABOVE FINISHED GRADE	(N) - NEW
AHU- AIR HANDLING UNIT	NEC- NATIONAL ELECTRICAL CODE.
AP - ACCESS PANEL	NG - NATURAL GAS
CD - CONDENSATE DRAIN	NIC - NOT IN CONTRACT
C.I. - CAST IRON	NTS - NOT TO SCALE.
CLG- CEILING	SAN - SANITARY
C.O. - CONDUIT ONLY.	TYP - TYPICAL.
CON- CONNECT/CONNECTION	VTR- VENT THROUGH ROOF
CONT- CONTINUATION	FLR - FLOOR
CW - COLD WATER	FD - FLOOR DRAIN
DF - DRINKING FOUNTAIN	FU - FIXTURE UNIT
DN - DOWN	FV - FLUSH VALVE
DOAS- DEDICATED OUTDOOR AIR SYSTEM	GRD- GRADE
(E) - EXISTING.	GPM- GALLONS PER MINUTE

PLUMBING SHEET LIST	
P-000 - GENERAL NOTES AND ABBREVIATIONS	
P-001 - SPECIFICATIONS - PLUMBING	
P-100 - FLOOR PLAN - SANITARY WASTE & VENT	
P-101 - FLOOR PLAN - DOMESTIC WATER & GAS	
P-200 - DETAILS(1 OF 2)	
P-201 - DETAILS(2 OF 2)	
P-300 - PLUMBING SCHEDULE	
P-400 - ISOMETRIC - PLUMBING RISER	

PLUMBING NOTES	
1.	PROVIDE NEW DOMESTIC WATER, SANITARY WASTE/VENT AND NATURAL GAS AS INDICATED ON DRAWINGS. PROVIDE ALL NECESSARY COMPONENTS FOR FULLY OPERATIONAL SYSTEM. INSTALL SYSTEMS IN ACCORDANCE WITH STATE REQUIREMENTS AND LOCAL AUTHORITY HAVING JURISDICTION. COORDINATE THE LOCATION OF ALL UTILITY CONNECTION POINTS, FLOOR DRAINS AND HUB DRAINS FOR EQUIPMENT WITH OTHER TRADES.
2.	ALL ABOVE FLOOR PENETRATIONS TO BE SEALED WATER TIGHT AND COMPLETELY PACKED WITH FIRE STOP MATERIAL BY TRADE CONTRACTORS.
3.	THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE NOT INTENDED TO SHOW THE EXACT LOCATIONS OF COMPONENTS. NOR SHOW ALL SYSTEM COMPONENTS. CONTRACTOR SHALL PROVIDE ADDITIONAL OFFSETS OR FITTINGS REQUIRED FOR PROPER INSTALLATION, COORDINATION WITH OTHER TRADES, AND/OR TO MAINTAIN PROPER CLEARANCES.
4.	DRAWINGS ARE NOT TO BE SCALED, DIMENSIONS SHALL GOVERN. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE JOB SITE CONCERNING EXISTING AND NEW WORK BEFORE PROCEEDING WITH EITHER FABRICATION OR INSTALLATION IN MECHANICAL AREAS WITH NUMEROUS OBSTRUCTIONS INCLUDING DUCTWORK, EQUIPMENT AND PIPING. THIS WILL REQUIRE ON SITE CUTTING AND VERIFICATION.
5.	ANY INFORMATION CONFLICTS BETWEEN THE SPECIFICATIONS AND DRAWINGS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION. THE CONTRACTOR(S) SHALL NOT PROCEED WITH ANY WORK EXCEPT AT THEIR OWN RISK UNTIL CLARIFICATIONS OF THE CONFLICTS ARE ISSUED TO THE CONTRACTOR(S) BY THE ENGINEER.
6.	THE TERM "PROVIDE" SHALL MEAN THE CONTRACTOR SHALL FURNISH, INSTALL AND CONNECT FOR A COMPLETE AND OPERATIONAL SYSTEM.
7.	ALL MATERIAL AND LABOR SHALL BE UNDER WARRANTY FOR ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER. ANY NEW DEVICES OR EQUIPMENT FOUND FAULTY SHALL BE REPLACED AS PART OF THE WARRANTY.
8.	A SET OF APPROVED DRAWINGS SHALL BE MAINTAINED ON SITE AND ALL FIELD CHANGES SHALL BE RED LINED ON THE DRAWINGS. CONTRACTOR SHALL PREPARE "AS-BUILT" DRAWINGS IN ELECTRONIC (AUTOCAD) FORMAT, REFLECTING ACCURATE FIELD CONDITIONS.
9.	ALL PENETRATIONS THROUGH FIRE RESISTANCE RATED CONSTRUCTION SHALL BE PROVIDED A UL LISTED THROUGH PENETRATION FIRESTOP ASSEMBLY. THE RATINGS OF ALL FIRESTOP ASSEMBLIES SHALL BE GREATER THAN OR EQUAL TO THE RATING OF THE PENETRATED BARRIER.
10.	CORE DRILL PENETRATIONS IN CONCRETE FLOORS OR WALLS 1-2 INCHES LARGER THAN THE PIPE DIAMETER OF THE PENETRATING PIPE.
11.	DUCTWORK, PIPING, MECHANICAL EQUIPMENT AND CEILINGS SHALL NOT BE UTILIZED AS LADDERS, SCAFFOLDING OR WORK PLATFORMS.
12.	NO STRUCTURAL MEMBERS SHALL BE CUT, DRILLED, OR BURNED WITHOUT THE KNOWLEDGE AND WRITTEN APPROVAL OF THE OWNER/ ARCHITECT.
13.	EQUIPMENT, MATERIALS, INSTALLATION WORKMANSHIP, EXAMINATION AND TESTING SHALL BE IN ACCORDANCE WITH CURRENT PLUMBING CODE. INSTALL PIPING STRAIGHT AND TRUE TO BEAR EVENLY ON HANGARS AND SUPPORTS. PIPE SHALL NOT INTERFERE WITH OTHER EQUIPMENT AND CONSTRUCTION.
14.	CONTRACTOR SHALL BE RESPONSIBLE FOR AVOIDING ALL CONFLICTS WITH LIGHTING FIXTURES, DIFFUSERS, GRILLS, DUCTS, STRUCTURAL MEMBERS, MECHANICAL EQUIPMENT AND PIPES.
15.	CONTRACTOR SHALL SUBMIT SYSTEM CATALOG PRODUCT DATA SHEETS OF ALL COMPONENTS PROPOSED FOR USE PRIOR TO INSTALLATION FOR APPROVAL. SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL.
16.	ALL MATERIALS AND EQUIPMENT SHALL BE NEW UNLESS MENTIONED IN DRAWING/SCHEDULE.
17.	PIPING SHALL NOT SHARE SUPPORTS WITH OTHER BUILDING SYSTEMS. IN MECHANICAL AREAS, PIPING SHALL NOT BE ATTACHED TO THE DUCT WORK. STATIONS SHALL BE USED WHERE PIPING IS UNABLE TO BE HUNG FROM ABOVE.
18.	PIPING IN AREAS WITH FINISHED CEILINGS SHALL BE INSTALLED ABOVE FINISHED CEILINGS.
19.	CONTRACTOR SHALL PROVIDE LABELS (WITH FLOW ARROWS) FOR ALL PIPING.
20.	PIPING SHALL NOT PASS THROUGH ELECTRICAL ROOMS OR OVER ELECTRICAL PANELS / EQUIPMENT WHICH SERVES OTHER AREAS. COORDINATE THE LOCATION OF ALL PIPING WITH ELECTRICAL EQUIPMENT AND OTHER TRADES AND ADJUST AS NECESSARY.
21.	MAKE REASONABLE AND NECESSARY MODIFICATIONS IN LAYOUTS AND COMPONENTS NEEDED TO PREVENT CONFLICTS WITH WORK OF OTHER TRADES AND TO COORDINATE IN ACCORDANCE WITH SPECIFICATIONS.
22.	MAINTAIN MAXIMUM HEADROOM AT ALL LOCATIONS. ALL PIPING TO BE AS TIGHT TO THE UNDERSIDE OF DECK AS POSSIBLE. ALL EXPOSED PIPING SHALL BE APPROVED BY ARCHITECT AND SHALL MAINTAIN REQUIRED CLEARANCES.
23.	ALL SANITARY AND VENT PIPE SHALL BE IN SLOPE AS PER CODE REQUIREMENTS.
24.	PLUMBING CONTRACTOR SHALL COORDINATE WITH ARCHITECTURAL FOR PAINTING ON EXPOSED PIPING/INSULATION.
25.	SLOPE WASTE LINES AT 2%, 1% SLOPE IS ONLY ALLOWED WITH PRIOR APPROVAL BY LOCAL JURISDICTION.

CALIFORNIA CODES AND STANDARDS	
TITLE 24 C.C.R., PART1	2022 CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE.
TITLE 24 C.C.R., PART2	2022 CALIFORNIA BUILDING CODE (CBC)
TITLE 24 C.C.R., PART3	2022 CALIFORNIA ELECTRICAL CODE (CEC)
TITLE 24 C.C.R., PART4	2022 CALIFORNIA MECHANICAL CODE (CMC)
TITLE 24 C.C.R., PART5	2022 CALIFORNIA PLUMBING CODE (CPC)
TITLE 24 C.C.R., PART6	2022 CALIFORNIA ENERGY CODE
TITLE 24 C.C.R., PART7	(NO LONGER PUBLISHED IN TITLE 24. SEE TITLE 8, CCR)
TITLE 24 C.C.R., PART8	2022 CALIFORNIA HISTORICAL BUILDING CODE
TITLE 24 C.C.R., PART9	2022 CALIFORNIA FIRE CODE (CFC)
TITLE 24 C.C.R., PART10	2022 CALIFORNIA EXISTING BUILDING CODE
TITLE 24 C.C.R., PART11	2022 CALIFORNIA GREEN BUILDING STANDARDS CODE
TITLE 24 C.C.R., PART12	2022 CALIFORNIA REFERENCED STANDARDS CODE
TITLE 19, C.C.R.,	PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.



SECTION 22 11 16 - DOMESTIC WATER PIPING

- 1.1 PIPING
 - A. GENERAL: THE OUTSIDE OF ALL PIPING AND FITTINGS SHALL BEAR THE MANUFACTURER'S STANDARD MARKING FOR TYPE, PRESSURE, ETC. THE A/E DOES NOT GUARANTEE THE ACCURACY OF THE FIGURE NUMBERS AS LISTED.
 - B. PIPE - GENERAL: ALL CARBON STEEL PIPE SHALL BE FABRICATED FROM OPEN HEARTH OR ELECTRICAL FINISHED PIPE. NO BESSEMER PIPE SHALL BE INSTALLED. ALL PIPE AND FITTINGS SHALL BE FULLY TO BE INSTALLED AS CLOSE TO THE BUILDING AS POSSIBLE. ALL OVERHEAD CAST IRON DRAINS SHALL BE SUPPORTED AT EACH JOINT, EACH CHANGE OF DIRECTIONS, EACH CAST IRON TRAP, AND ALL NECESSARY INTERMEDIATE POINTS TO MAINTAIN A UNIFORM PITCH WITHOUT SAGGING OR POCKETING OF THE LINE.
 - C. WALL SUPPORT FOR PIPE SIZES 2 TO 3 INCHES: CAST IRON HOOK.
 - D. VERTICAL SUPPORT: STEEL RISER CLAMP.
 - E. FLOOR SUPPORT FOR PIPE SIZES 2 TO 8 INCHES: CAST IRON ADJUSTABLE PIPE SADDLE, LOCKNUT NIPPLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.
 - F. SHIELD FOR INSULATED PIPING 2 INCHES AND SMALLER: 18 GAGE GALVANIZED STEEL SHIELD OVER INSULATION IN 180 DEGREE SEGMENTS, MINIMUM 12 INCHES LONG AT PIPE SUPPORT.
 - G. ACCEPTABLE MANUFACTURERS: PIPE HANGERS: ELCEN METAL PRODUCTS CO., B-LINE SYSTEMS INC., CARPENTER AND PATERSON INC., ANVIL.
- 1.2 PIPING AUXILIARIES/SPECIALTIES
 - A. GENERAL: ALL AUXILIARIES AND SPECIALTIES SHALL BE GUARANTEED BY THE MANUFACTURER FOR THE PRESSURE, TEMPERATURE AND MATERIALS BEING HANDLED. ALL AUXILIARIES AND SPECIALTIES SHALL BE SUITABLE FOR THE PIPING TO WHICH THEY ARE ATTACHED.
 - B. STRAINERS: MANUFACTURERS: SARCO, ANDERSON, ARMSTRONG, CRANE, OR WATTS. SARCO TYPE BT OR BF, 150, BRONZE BODY WITH STAINLESS STEEL SCREEN. PROVIDE DRAIN VALVE ON STRAINER.
 - C. WATER HAMMER ARRESTERS: MANUFACTURERS: JOSAM, MIFAB, WADE, J.R. SMITH, WATTS, OR ZURN. JOSAM TYPE "ABSORBATRON". MEET THE REQUIREMENTS OF FDI STANDARD 201 FOR SIZE AND LOCATION. SIZE OF UNIT SHALL BE CLEARLY INDICATED ON UNIT.
 - D. GAUGE COCKS: POWELL FIG. 757, OR EQUAL BY ANVIL, WALTTEC, VICTAULIC, WHITE ROGERS.
 - E. TEMPERATURE AND PRESSURE RELIEF VALVES: ASME-CODED, ALL-BRONZE CONSTRUCTION WITH SEAT TO DISC ALIGNMENT THAT WILL NOT STICK OR FREEZE. SHALL START TO OPEN AT 230 DEG F AND SHALL BE FULLY OPEN AT 240 DEG F. SHALL HAVE SNAP ACTION THERMOSTAT AND SENSING BULB SIZED TO WATER HEATER MANUFACTURER'S RECOMMENDATIONS. MANUFACTURERS: WATTS, MCDONNELL, WILKINS, CONBRACO.

- INSULATE AND VAPOR SEAL HANGERS, SUPPORTS, AND ANCHORS THAT ARE SECURED DIRECTLY TO COLD SURFACES TO PREVENT CONDENSATION.
- F. CONTINUE INSULATION THROUGH SLEEVES AND WALL AND CEILING OPENINGS EXCEPT INSULATION SHALL NOT CONTINUE THROUGH FIRE-RATED (2-HOUR OR GREATER) PARTITIONS, WALLS, FLOOR-CEILING SYSTEMS.
- G. INSULATE ALL FITTINGS, VALVE BODIES, FLANGES AND OTHER PIPELINE ACCESSORIES.
- 1.9 PIPE HANGERS AND SUPPORTS
 - A. HANGERS FOR PIPE SIZES 1/2 TO 1 1/2 INCH: CADMIUM PLATED CARBON STEEL, ADJUSTABLE SWIVEL SPLIT RING. USE PVC COATED OR COPPER PLATED FOR COPPER PIPING.
 - B. HANGERS FOR PIPING THAT GETS INSULATED SHALL BE SIZED TO ALLOW INSULATION TO BE CONTINUOUS THROUGH HANGERS.
 - C. WALL SUPPORT FOR PIPE SIZES 2 TO 3 INCHES: CAST IRON HOOK.
 - D. VERTICAL SUPPORT: STEEL RISER CLAMP.
 - E. FLOOR SUPPORT FOR PIPE SIZES 2 TO 8 INCHES: CAST IRON ADJUSTABLE PIPE SADDLE, LOCKNUT NIPPLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.
 - F. SHIELD FOR INSULATED PIPING 2 INCHES AND SMALLER: 18 GAGE GALVANIZED STEEL SHIELD OVER INSULATION IN 180 DEGREE SEGMENTS, MINIMUM 12 INCHES LONG AT PIPE SUPPORT.
 - G. ACCEPTABLE MANUFACTURERS: PIPE HANGERS: ELCEN METAL PRODUCTS CO., B-LINE SYSTEMS INC., CARPENTER AND PATERSON INC., ANVIL.
- 1.10 HANGER RODS AND ATTACHMENTS
 - A. HANGER RODS OR CHAINS: THREADED BOTH ENDS, THREADED ONE END, OR CONTINUOUS THREADED. USE CADMIUM PLATED RODS WHERE UNCONCEALED OR EXPOSED TO THE ELEMENTS.
 - B. BEAM CLAMPS (UP TO 8-INCH DIAMETER PIPE): TOP BEAM CLAMP, STEEL JAW, HOOK ROD WITH NUT AND SPRING WASHER STEEL EYE-BOLT. C-CLAMPS BY THEMSELVES ARE EXPRESSLY PROHIBITED UNLESS OTHERWISE APPROVED BY STRUCTURAL ENGINEER.
- 1.11 PIPE SLEEVES AND SEALANTS
 - A. SLEEVES - GENERAL: SLEEVE ALL PIPING PASSING THROUGH WALLS, FLOORS, ROOFS, FOUNDATIONS, FOOTINGS AND GRADE BEAMS SUFFICIENT TO ALLOW FREE MOVEMENT OF PIPING.
 - B. SLEEVE SIZES: LENGTH: ENDS FLUSH WITH FINISHED SURFACES. DIAMETER: MINIMUM 3 INCH, MINIMUM 1 INCH LARGER THAN PIPE AND PIPE INSULATION. DIAMETER SUITABLE FOR CONSTRUCTION TOLERANCES AND TO RECEIVE SEALANT, WHEN INDICATED.
 - C. SEALANTS: SEAL ANNUAL SPACE AROUND PIPING: FOR FIRE- AND SMOKE-RATED FLOORS, WALLS AND PARTITIONS: USE UL-LISTED FIRESTOPPING MATERIAL THAT MAINTAINS FIRE-RATED WALL AND FLOOR INTEGRITY. PROVIDE PROPER MATERIAL FOR EACH TYPICAL APPLICATION AS DESCRIBED BY MANUFACTURER. ACCEPTABLE MANUFACTURERS: DOW CORNING "FIRE STOP", NELSON "FLAMESEAL", 3M "FIRE BARRIER", PIPE SHIELDS INC., MODEL WFB, DFB, OR DDFB SERIES, PROSET SYSTEMS. FOR NON-RATED WALLS AND PARTITIONS: USE MINERAL OR GLASS FIBER INSULATION. FOR EXTERIOR AND FOUNDATION WALLS: USE SYNTHETIC RUBBER SEALS, "LINK-SEAL" WATERPROOF MATERIAL OR SYSTEM.

- ON, EXTENDING TO TOP OF PIPE AND TURNED DOWN 2-INCH INSIDE.
- 1.5 BUILDING DRAINAGE SYSTEM - INSTALLATION
 - A. GENERAL: ALL SANITARY LINES SHALL BE OF THE SIZES NOTED AND ROUTED AS INDICATED. UNLESS OTHERWISE INDICATED OR REQUIRED BY CODES, ALL BUILDING DRAINS SHALL BE INSTALLED WITH A MINIMUM UNIFORM GRADE OF ONE PERCENT (1%). NO UNDERGROUND DRAINS SHALL BE INSTALLED IN WATER TRENCHES SHALL BE DRY AND ACCEPTABLE BEFORE LAYING OF PIPE. ALL OVERHEAD LINES SHALL BE SUPPORTED AS CLOSE TO THE BUILDING AS POSSIBLE. ALL OVERHEAD CAST IRON DRAINS SHALL BE SUPPORTED AT EACH JOINT, EACH CHANGE OF DIRECTIONS, EACH CAST IRON TRAP, AND ALL NECESSARY INTERMEDIATE POINTS TO MAINTAIN A UNIFORM PITCH WITHOUT SAGGING OR POCKETING OF THE LINE.
 - B. TRAPS AND OR CLEAN-OUTS: DISCHARGE CONNECTIONS, AND WHERE INDICATED, LOCATE FOR EASE OF SERVICE. ANY OTHER TRAPS REQUIRED BY OFFICIAL BODIES HAVING JURISDICTION SHALL BE INSTALLED AT NO ADDITIONAL COST TO THE OWNER. WHERE TRAPS ON PLUMBING FIXTURES ARE INSTALLED BELOW GRADE OR OTHERWISE CONCEALED, A CLEAN-OUT SHALL BE INSTALLED IN THE ADJACENT FINISHED SURFACE AS INDICATED.
- 1.6 PIPE HANGERS AND SUPPORTS
 - A. HANGERS FOR PIPE SIZES 1/2 TO 1 1/2 INCH: CADMIUM PLATED CARBON STEEL, ADJUSTABLE SWIVEL SPLIT RING. USE PVC COATED OR COPPER PLATED FOR COPPER PIPING.
 - B. HANGERS FOR PIPE SIZES 2 AND OVER: CARBON STEEL, ADJUSTABLE, CLEVIS TYPE.
 - C. WALL SUPPORT FOR PIPE SIZES 2 TO 3 INCHES: CAST IRON HOOK.
 - D. WALL SUPPORT FOR PIPE SIZES 4 INCHES AND OVER: WELDED STEEL BRACKET AND WROUGHT STEEL CLAMP.
 - E. VERTICAL SUPPORT: STEEL RISER CLAMP.
 - F. FLOOR SUPPORT FOR PIPE SIZES 2 TO 8 INCHES: CAST IRON ADJUSTABLE PIPE SADDLE, LOCKNUT NIPPLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.
 - G. ACCEPTABLE MANUFACTURERS: PIPE HANGERS: ELCEN METAL PRODUCTS CO., B-LINE SYSTEMS INC., CARPENTER AND PATERSON INC., ANVIL.
- 1.7 HANGER RODS AND ATTACHMENTS
 - A. STEEL HANGER RODS: THREADED BOTH ENDS, THREADED ONE END, OR CONTINUOUS THREADED. USE CADMIUM PLATED RODS WHERE UNCONCEALED OR EXPOSED TO THE ELEMENTS.
 - B. BEAM CLAMPS (UP TO 8-INCH DIAMETER PIPE): TOP BEAM CLAMP, STEEL JAW, HOOK ROD WITH NUT AND SPRING WASHER STEEL EYE-BOLT. C-CLAMPS BY THEMSELVES ARE EXPRESSLY PROHIBITED UNLESS OTHERWISE APPROVED BY STRUCTURAL ENGINEER.
- 1.8 PIPE SLEEVES AND SEALANTS
 - A. SLEEVES - GENERAL: SLEEVE ALL PIPING PASSING THROUGH WALLS, FLOORS, ROOFS, FOUNDATIONS, FOOTINGS AND GRADE BEAMS SUFFICIENT TO ALLOW FREE MOVEMENT OF PIPING.
 - B. SLEEVE SIZES: LENGTH: ENDS FLUSH WITH FINISHED SURFACES. DIAMETER: MINIMUM 3 INCH, MINIMUM 1 INCH LARGER THAN PIPE AND PIPE INSULATION. DIAMETER SUITABLE FOR CONSTRUCTION TOLERANCES AND TO RECEIVE SEALANT, WHEN INDICATED.
 - C. SEALANTS: SEAL ANNUAL SPACE AROUND PIPING: FOR FIRE- AND SMOKE-RATED FLOORS, WALLS AND PARTITIONS: USE UL-LISTED FIRESTOPPING MATERIAL THAT MAINTAINS FIRE-RATED WALL AND FLOOR INTEGRITY. PROVIDE PROPER MATERIAL FOR EACH TYPICAL APPLICATION AS DESCRIBED BY MANUFACTURER. ACCEPTABLE MANUFACTURERS: DOW CORNING "FIRE STOP", NELSON "FLAMESEAL", 3M "FIRE BARRIER", PIPE SHIELDS INC., MODEL WFB, DFB, OR DDFB SERIES, PROSET SYSTEMS. FOR NON-RATED WALLS AND PARTITIONS: USE MINERAL OR GLASS FIBER INSULATION. FOR EXTERIOR AND FOUNDATION WALLS: USE SYNTHETIC RUBBER SEALS, "LINK-SEAL" WATERPROOF MATERIAL OR SYSTEM.

- E. USE FITTINGS FOR ALL CHANGES IN DIRECTION AND ALL BRANCH CONNECTIONS.
- F. INSTALL EXPOSED PIPING AT RIGHT ANGLES OR PARALLEL TO BUILDING WALLS. DIAGONAL RUNS ARE NOT PERMITTED, UNLESS EXPRESSLY INDICATED.
- G. INSTALL PIPING FREE OF SAGS OR BENDS AND WITH AMPLE SPACE BETWEEN INDICATED. UNLESS OTHERWISE INDICATED OR REQUIRED BY CODES, ALL CONCEAL ALL PIPE INSTALLATIONS IN WALLS, PIPE CHASES, UTILITY SPACES, ABOVE CEILINGS, BELOW GRADE OR FLOORS, UNLESS INDICATED TO BE EXPOSED TO VIEW.
- I. INSULATE PIPING TIGHT TO SLABS, BEAMS, JOISTS, COLUMNS, WALLS, AND OTHER PERMANENT ELEMENTS OF THE BUILDING. PROVIDE SPACE TO PERMIT INSULATION APPLICATIONS, WITH 1-INCH CLEARANCE OUTSIDE THE INSULATION, ALLOW SUFFICIENT SPACE ABOVE REMOVABLE CEILING PANELS TO ALLOW FOR PANEL REMOVAL.
- J. INSULATION OF PIPES PARALLEL TO EACH OTHER, SPACED TO PERMIT APPLYING INSULATION AND SERVICING OF VALVES.
- K. INSTALL GAS PIPING AT A UNIFORM GRADE OF 1/4 INCH IN 15 FEET, UPWARD TO RISERS, AND FROM THE RISERS TO THE METER, OR SERVICE REGULATOR WHEN BELOW GRADE OR OTHERWISE CONCEALED. A CLEAN-OUT SHALL BE INSTALLED IN THE ADJACENT FINISHED SURFACE AS INDICATED.
- L. MAKE REDUCTIONS IN PIPE SIZES USING ECCENTRIC REDUCER FITTINGS INSTALLED WITH THE LEVEL SIDE DOWN.
- M. CONNECT BRANCH OUTLET PIPES FROM THE TOP OR SIDES OF HORIZONTAL LINES, NOT FROM THE BOTTOM.
- N. INSTALL UNIONS IN THREADED PIPES, ADJACENT TO EACH VALVE. AT FINAL CONNECTIONS TO EACH PIECE OF EQUIPMENT, AND ELSEWHERE AS INDICATED UNIONS ARE NOT REQUIRED ON FLANGED DEVICES.
- O. INSTALL DIELECTRIC UNIONS WHERE PIPING OF DISSIMILAR METALS ARE JOINED.
- P. INSULATION OPERATIONS: THAT PORTION OF PIPE SHALL NOT BE USED.
- Q. INSTALL STRAINERS ON THE SUPPLY SIDE OF EACH CONTROL VALVE, PRESSURE REDUCING VALVE, SPRING REGULATING VALVE, SOLENOID VALVE, AND ELSEWHERE AS INDICATED.

- 1.3 PIPING INSTALLATION - GENERAL
 - A. GENERAL: PIPING SHALL BE INSTALLED IN A MANNER WHICH PERMITS EASY REMOVAL OF VALVES AND CONNECTIONS OF EQUIPMENT. UNIONS OR FLANGED JOINTS SHALL BE INSTALLED FOR THIS PURPOSE. CONNECTIONS TO EQUIPMENT SHALL BE ARRANGED TO FACILITATE EASE OF REMOVAL AND SERVICE WITHOUT DISMANTLING OF THE RUN-OUTS OF MAIN PIPING, AND SHALL BE INSTALLED BY THE USE OF MULTIPLE ELBOWS OR OTHER SIMILAR METHODS TO MINIMIZE STRAIN ON THE EQUIPMENT CONNECTIONS. DIELECTRIC SEPARATION: PROVIDE DIELECTRIC SEPARATION AT ALL COPPER PIPING AND VALVES CONNECTED TO FERROUS PIPING. BRASS OR BRONZE VALVES INSTALLED IN FERROUS PIPING SHALL NOT REQUIRE DIELECTRIC SEPARATION. CONNECTIONS BETWEEN COPPER PIPING AND FERROUS FLANGED PIPING AND EQUIPMENT CONNECTIONS SHALL BE WITH A BRONZE COPPER COMPANION FLANGE WITH DIELECTRIC SEPARATION FOR FLANGES AND BOLTS. CONNECTIONS BETWEEN COPPER PIPING AND SCREWED FERROUS PIPING SHALL BE CLEARFLOW DIELECTRIC WATERWAY FITTINGS. PROVIDE ALL ROUGH, IN AND FINAL CONNECTIONS TO EQUIPMENT AND SERVICES INDICATED IN THE CONTRACT DOCUMENTS FOR EQUIPMENT AND SERVICES TO BE FUNCTIONAL.
- 1.4 BUILDING PIPING SYSTEM - INSTALLATION
 - A. DOMESTIC WATER: COLD, HOT, TEMPERED, RECIRCULATING: ALL PIPING SHALL BE INSTALLED AND PITCHED TO PROVIDE PROPER DRAINAGE. INSTALL DRAIN VALVES AT ALL LOW POINTS AND AS REQUIRED TO PROVIDE DRAINAGE FACILITIES FOR THE PIPING. WHEREVER SYSTEM IS SECTIONALIZED, INSTALL DRAIN VALVES BETWEEN EACH SECTIONAL SHUT-OFF VALVE. ALL HOT WATER PIPING SHALL BE PITCHED TO PROVIDE NATURAL GRAVITY DRAINAGE. PROVIDE DRAINAGE TO A RECIRCULATION PUMP. INSTALL PRESSURE GAUGE IN DOMESTIC COLD WATER MAIN AT WATER ENTRANCES TO BUILDING.
 - B. SHOCK ELIMINATION: ALL PIPING SHALL BE PROTECTED AGAINST WATER SHOCK. INSTALL A WATER HAMMER ARRESTOR OF THE PROPER SIZE AT THE END OF THE MAIN, AT THE END OF ALL BRANCH LINES, AND AT THE END OF LINES SERVING GROUPS OF FIXTURES. WATER HAMMER ARRESTORS SHALL BE SIZED AND INSTALLED AS RECOMMENDED BY THE PLUMBING AND DRAINAGE INSTITUTE, AND SHALL ELIMINATE WATER HAMMER. ALL WATER HAMMER ARRESTORS SHALL BE INSTALLED IN LOCATIONS WHERE THEY ARE READILY ACCESSIBLE FOR SERVICE, WHERE REQUIRED, PROVIDE SUITABLE ACCESS DOORS.

- 1.2 CLEANING AND PREPARATION FOR SERVICE
 - A. FLUSHING MAINS: IMMEDIATELY UPON COMPLETION OF THE WATER DISTRIBUTION SYSTEM, TEST VALVES TO ENSURE THEIR FULL OPENING. FLUSH THE SYSTEM AS FOLLOWS: OPEN VALVE AND PERMIT THE FLOW TO CONTINUE UNTIL THE WATER RUNS CLEAR. REPEAT THE OPERATION AT THE NEXT VALVE AND PROCEED IN ORDER TO THE VALVE FARTHEST FROM THE SOURCE OF SUPPLY. USE OUTLETS IN BUILDING TO FLUSH THE UPPER ENDS OF MAINS AND SERVICE LINES. DURING SUCH FLUSHING OPERATION, THE A/E MAY TEST THE FLOWS FROM VALVES AND, BEFORE FINAL ACCEPTANCE OF THE WORK, MAKE FURTHER TESTS OF FLOWS TO ASCERTAIN THAT LINES ARE CLEAR.
 - B. INTERIOR AND EXTERIOR STERILIZATION OF WATER DISTRIBUTION SYSTEM: AFTER THE WATER DISTRIBUTION SYSTEM HAS BEEN FLUSHED, STERILIZE THE SYSTEM BY THE FOLLOWING OR OTHER, MORE RIGID METHODS SATISFACTORY TO THE A/E AND THE STATE AND LOCAL PLUMBING AUTHORITIES. INTRODUCE CHLORINE OR A SOLUTION OF CALCIUM OR SODIUM HYPOCHLORITE, FILLING THE LINES TO 25 PPM AND APPLYING THE STERILIZING AGENT AT A RATE OF 10 PARTS PER MILLION OF CHLORINE, AS DETERMINED BY RESIDUAL CHLORINE TESTS AT THE ENDS OF THE LINES. OPEN AND CLOSE ALL VALVES AND HYDRANTS WHILE CHLORINATING THE SYSTEM. AFTER STERILIZATION AGENT HAS BEEN APPLIED FOR 24 HOURS, TEST FOR RESIDUAL CHLORINE AT THE ENDS OF THE LINES. IF LESS THAN 25 PPM IS INDICATED, REPEAT THE STERILIZATION PROCESS. WHEN TESTS SHOW AT LEAST 25 PPM OF RESIDUAL CHLORINE, FLUSH THE SYSTEM UNTIL ALL TRACES OF THE CHEMICAL ARE REMOVED.
 - C. THE OWNER RESERVES THE RIGHT TO REQUIRE TESTING OF THE WATER AGAIN AT ANY TIME PRIOR TO FINAL ACCEPTANCE OF THE WORK AND, IF FOUND BACTERIOLOGICALLY UNSAFE, TO REQUIRE THE CONTRACTOR TO RECHLORINATE THE SYSTEM UNTIL THE WATER IS PROVEN EQUAL TO THAT SUPPLIED BY THE PUBLIC SYSTEM.

- SECTION 22 20 00 - FACILITY NATURAL GAS SYSTEM
- 1.1 PIPING
 - A. BELOW-GROUND PIPE 5 FEET FROM THE BUILDING TO ABOVE-GROUND AT THE BUILDING SHALL BE SCHEDULE 40 WELDED JOINT STEEL PIPE WITH FACTORY-APPLIED PROTECTIVE COATING, SUCH AS X-TRU-COTE. JOINTS SHALL BE FIELD-COATED WITH THE SAME MATERIAL APPLIED AS RECOMMENDED BY THE MANUFACTURER. IF UNDERGROUND GAS DISTRIBUTION PIPE IS STEEL, PROVIDE A DIELECTRIC UNION AT POINT OF CONNECTION. INSTALL A 17-POUND ANODIZED BRACK BETWEEN THE BUILDING AND 5 FEET OUTSIDE THE BUILDING NEXT TO THE CONNECTION TO THE MAIN SERVICE PIPE. ATTACH THE ANODE LEAD WIRE TO THE PIPING BY MEANS OF AN EXOTHERMIC WELD, FOLLOWING THE INSTRUCTIONS OF THE MANUFACTURER.
 - B. ABOVE-GROUND GAS PIPING: STANDARD WEIGHT, SCHEDULE 40, WELDED OR SCREWED, BLACK CARBON STEEL PIPE, ANSIASTM A53.
 - 1. 1-1/2 INCHES AND SMALLER: 150 LB. SCREWED MALLEABLE BLACK IRON FITTINGS.
 - 2. 1-1/2 INCHES AND SMALLER IN CONCEALED SPACES: SCHEDULE 40 BLACK STEEL WITH SOCKET WELDED FITTINGS.
 - 3. 2 INCHES TO 2-1/2 INCHES: WELDED OR FORGED STEEL FITTING, SOCKET WELDED AND THREADED.
 - 4. 3 INCHES AND LARGER: FORGED STEEL BUTT WELDED, FLANGED, 150 SWP. PROVIDE GASKETS SUITABLE FOR NATURAL GAS.
 - C. ALL CONCEALED PIPING SHALL BE WELDED.
 - D. ALL GAS PIPING EXPOSED TO OUTSIDE WEATHER ENVIRONMENT SHALL BE PROTECTED FROM CORROSION BY APPLICATION OF A NON-METALLIC-BASED PAINTING SYSTEM SPECIFICALLY DESIGNED AND MANUFACTURED FOR PROTECTION OF STEEL STRUCTURES. COLOR AS SELECTED BY OWNER. THE UNION OF THE UNDERGROUND COATING AND ABOVE-GROUND PAINT SHALL BE AT LEAST 2 INCHES ABOVE FINISHED GRADE AND SHALL BE WELL-BONDED BY APPLICATION OF THE COATING MATERIALS.
 - E. GAS PIPING WITHIN THE BUILDING SHALL BE ELECTRICALLY CONTINUOUS AND BONDED TO A GROUNDING ELECTRODE.

- 1.5 VALVE APPLICATIONS
 - A. GENERAL: THE DRAWINGS INDICATE VALVE TYPES, LOCATIONS, AND SHUT-OFF DUTY. USE GAS COCKS SPECIFIED IN ABOVE.
- 1.6 VALVE INSTALLATIONS
 - A. INSTALL VALVES IN ACCESSIBLE LOCATIONS, PROTECTED FROM PHYSICAL DAMAGE. TAG VALVES WITH A METAL TAG ATTACHED WITH A METAL CHAIN INDICATING THE PIPING SYSTEMS SUPPLIED.
 - B. INSTALL A GAS COCK UPSTREAM OF EACH GAS PRESSURE REGULATOR. WHERE TWO GAS PRESSURE REGULATORS ARE INSTALLED IN SERIES IN A SINGLE GAS LINE, A SECOND REGULATOR SHALL BE INSTALLED UPSTREAM OF THE FIRST.
 - C. INSTALL PRESSURE RELIEF OR PRESSURE LIMITING DEVICES SO THEY CAN BE READILY OPERATED TO DETERMINE IF THE VALVE IS FREE; SO THEY CAN BE TESTED TO DETERMINE THE PRESSURE AT WHICH THEY WILL OPERATE; AND EXAMINED FOR LEAKAGE WHEN IN THE CLOSED POSITION.

- 1.5 DOMESTIC WATER VALVES
 - A. FOR SERVICE VALVES WITHIN COPPER PIPING OF 1/4 INCH THROUGH 2 INCH SIZE: TWO-PIECE BALL VALVE WITH BRONZE SOLDER ENDS, LEVER HANDLE, STAINLESS STEEL BALL AND STEM, CLASS 150 SWP-600 W.O.G.
 - B. FOR CHECK VALVES WITHIN HORIZONTAL STEEL OR COPPER LINES THROUGH 2 INCH SIZE: BRONZE CHECK VALVE WITH TEFLON DISC, THREADED ENDS, CLASS 150 SWP-300 W.O.G.
 - C. ACCEPTABLE MANUFACTURERS: CHECK & BALL VALVES: NIBCO, HAMMOND, CRANE, JENKINS, POWELL, MILWAUKEE, HOMESTEAD, APOLLO, MUELLER OR EQUIVALENT VALVES SHALL BE LEAD-FREE.
- 1.6 VALVE INSTALLATION
 - A. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS, AND ALL VALVES MUST BE SUITABLE FOR THE SERVICE INTENDED. PROVIDE SERVICE VALVE AT EVERY PIECE OF EQUIPMENT. SERVICE VALVES TO BE POSITIONED IN A MANNER TO ALLOW FOR EASE OF SERVICE AND REMOVAL OF EQUIPMENT WITH MINIMUM DISRUPTION OF THE PIPING SYSTEM.
 - C. ALL SHUT-OFF VALVES IN PLUMBING WATER SYSTEMS 2 INCH AND SMALLER SHALL BE BALL-TYPE.

- SECTION 22 13 13 - BUILDING SANITARY
- 1.1 PIPE MATERIALS
 - A. GENERAL: ALL PIPE SHALL BE CUT OFF EVEN AND REAMED FULL BORE. THREADS SHALL BE CUT SMOOTH, TRUE AND TO FULL STANDARD SIZE. PIPING SHALL BE INSTALLED CLEAN OF CHIPS, BURRS OR OIL. NO SALVAGED OR USED PIPE SHALL BE USED WITHOUT THE WRITTEN APPROVAL OF THE A/E OR OWNER. WHEREVER SUCH APPROVAL IS GIVEN, RECUT THE ENDS OF THE PIPE, SQUARE, CUT NEW THREADS ON SCREWED PIPE, AND THOROUGHLY CLEAN THE PIPE OF ALL RUST, DIRT, SCALE AND FOREIGN MATTER BEFORE INSTALLATION. HUBLESS CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 888 AND CISPI STANDARD 301. ALL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON PIPE INSTITUTE AND LISTED BY NSF INTERNATIONAL. HUB AND SPIGOT CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 74. ALL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON PIPE INSTITUTE AND LISTED BY NSF INTERNATIONAL.
 - B. BURIED SOIL, WASTE, AND VENT PIPING: ASTM A74 SERVICE WEIGHT CAST IRON PIPE, BITUMASTIC-COATED, BELL AND SPIGOT JOINTS, DRAINAGE FITTINGS WITH 304 STAINLESS STEEL MEETING ASTM A167-84. NEOPRENE GASKETS SHALL CONFORM TO ASTM C564. COUPLINGS SHALL HAVE A MINIMUM OF 2 SCREWDRIVER BANDS.
 - C. ABOVE-GROUND SOIL, WASTE AND VENT: CISPI 301 HUBLESS CAST IRON PIPE, BITUMASTIC-COATED, MECHANICAL JOINTS, DRAINAGE FITTINGS WITH 304 CORRUGATED STAINLESS STEEL COUPLINGS OR ASTM A74 SERVICE WEIGHT CAST IRON PIPE, BITUMASTIC-COATED, BELL AND SPIGOT JOINTS, DRAINAGE FITTINGS WITH ASTM C564 GASKETED JOINTS.

- 1.2 ACCESSORIES
 - A. GAS COCKS SHALL BE ROCKWELL NORDSTROM LUBRICATED PLUG, FIG. 114 OR 115 (REGULAR PATTERN), OR FIG. 142 OR 143 (SHORT PATTERN).
 - B. GAS PRESSURE REGULATORS SHALL BE AS MANUFACTURED BY EQUIUMETER, SPENCE OR FISHER. REGULATOR SHALL HAVE CAST IRON BODY, DIE-CAST ALUMINUM ALLOY DIAPHRAGM CASE AND ALUMINUM OR BRASS ORIFICES. SPRING SHALL BE ADJUSTABLE AND SELECTED FOR AN OUTLET PRESSURE OF 7.0 INCH TO 14-INCH. PROVIDE VENT GAS PRESSURE REGULATORS TO THE OUTDOOR ATMOSPHERE WITH SCREENED VENT CAPS.
 - C. PROVIDE GRINNELL FIGURE 13 OR FIGURE 2, FEE AND MASON OR CRANE NICKEL PLATED STEEL PLATES ON EXPOSED PIPES PASSING THROUGH WALLS, CEILINGS, FLOORS, AND PARTITIONS.
- 1.3 INSTALLATION
 - A. GAS PIPING SYSTEM INSTALLATION SHALL CONFORM TO THE STANDARD FOR THE INSTALLATION OF GAS APPLIANCES AND GAS PIPING USA Z21 ANSI Z106.1, NFPA NO. 54 AND NO. 58, THE RULES OF LOCAL AND STATE REGULATORY AGENCIES GOVERNING THE INSTALLATION OF GAS PIPING, THE GAS UTILITY ENERGY CODE FOR INDIRECT GAS SERVICE, AND LOCAL GAS UTILITY COMPANY.
 - B. LOCATIONS AND ARRANGEMENTS: DRAWINGS (PLANS, SCHEMATICS, AND DIAGRAMS) INDICATE THE GENERAL LOCATION AND ARRANGEMENT OF PIPING SYSTEMS. DESIGN LOCATIONS AND ARRANGEMENTS OF PIPING TAKE INTO CONSIDERATION PIPE SIZING, FLOW DIRECTION, SLOPE OF PIPE, EXPANSION, AND OTHER DESIGN CONSIDERATIONS, SO FAR AS PRACTICAL, INSTALL PIPING AS INDICATED.
 - C. CONCEALED LOCATIONS: EXCEPT AS SPECIFIED BELOW, INSTALL GAS PIPING (IN MASONRY WALLS) IN AN AIRTIGHT CONDUIT CONSTRUCTED OF SCHEDULE 40 SEAMLESS BLACK STEEL WITH WELDED JOINTS. VENT CONDUIT TO THE OUTSIDE AND TERMINATE WITH A SCREENED VENT CAP.
 - 1. ABOVE-CEILING LOCATIONS: GAS PIPING MAY BE INSTALLED IN ACCESSIBLE ABOVE-CEILING SPACES (SUBJECT TO THE APPROVAL OF THE AUTHORITY HAVING JURISDICTION), WHETHER OR NOT SUCH SPACES ARE USED AS A PLENUM. VALVES SHALL NOT BE LOCATED IN SUCH SPACES. PIPING IN PLENUMS SHALL BE WELDED.
 - 2. IN FLOORS: PIPING INSTALLED IN FLOORS SHALL HAVE PROTECTIVE WRAPPING SPECIFIED IN PART 2 ABOVE. PIPING CAST IN CONCRETE SLABS SHALL BE SURROUNDED WITH A MINIMUM OF 1-1/2 INCHES OF CONCRETE AND SHALL NOT BE IN PHYSICAL CONTACT WITH OTHER METALLIC STRUCTURES SUCH AS REINFORCING RODS OR ELECTRICAL NEUTRAL CONDUCTORS. PIPING SHALL NOT BE EMBEDDED IN CONCRETE SLABS CONTAINING QUICK-SET ADDITIVES OR CINDER AGGREGATE. PIPING SHALL BE WELDED.
 - 3. PIPING IN PARTITIONS: CONCEALED PIPING SHALL NOT BE LOCATED IN SOLID PARTITIONS.
 - 4. PROHIBITED LOCATIONS: DO NOT INSTALL GAS PIPING IN OR THROUGH A CIRCULATING AIR DUCT, CLOTHES CHUTE, CHIMNEY OR GAS VENT, VENTILATING DUCT, DUMBWATER OR ELEVATOR SHAFT. THIS DOES NOT APPLY TO ACCESSIBLE ABOVE-CEILING SPACES SPECIFIED ABOVE.
 - D. DRIPS AND SEDIMENT TRAPS: INSTALL A DRIP LEG AT POINTS WHERE CONDENSATE MAY COLLECT, AT THE OUTLET OF THE GAS METER, AND IN A LOCATION READILY ACCESSIBLE TO PERMIT CLEANING AND EMPTYING. DO NOT INSTALL DRIPS WHERE CONDENSATE IS LIKELY TO FREEZE. CONSTRUCT DRIPS AND SEDIMENT TRAPS USING A TEE FITTING WITH THE BOTTOM OUTLET PLUGGED OR CAPPED. USE A MINIMUM OF 3 PIPE DIAMETERS IN LENGTH FOR THE DRIP LEG. USE SAME SIZE PIPE FOR DRIP LEG AS THE CONNECTED PIPE. DRIP LEGS AT EQUIPMENT CONNECTIONS SHALL BE DOWN STREAM OF VALVE.

- 1.7 ELECTRICAL BONDING AND GROUNDING
 - A. INSTALL ABOVE-GROUND PORTIONS OF GAS PIPING SYSTEMS, UPSTREAM FROM EQUIPMENT SHUT-OFF VALVES ELECTRICALLY CONTINUOUS AND BONDED TO A GROUNDING ELECTRODE IN ACCORDANCE WITH NFPA 70 - "NATIONAL ELECTRICAL CODE".
 - B. DO NOT USE GAS PIPING AS A GROUNDING ELECTRODE.
 - C. CONFORM TO NFPA 70, NATIONAL ELECTRICAL CODE, FOR ELECTRICAL CONNECTIONS BETWEEN WIRING AND ELECTRICALLY-OPERATED CONTROL DEVICES.
- 1.8 FIELD QUALITY CONTROL
 - A. PIPING TESTS: INSPECT, TEST, AND PURGE NATURAL GAS SYSTEMS IN ACCORDANCE WITH NFPA 54 AND LOCAL UTILITY REQUIREMENTS.

- 1.7 PIPE INSULATION
 - A. NON-FLEXIBLE: O-C FIBERGLAS AS/JSS/II-PIPE INSULATION WITH ALL SERVICE JACKET (AS.J). THERMAL CONDUCTIVITY (K VALUE): NOT GREATER THAN 0.23 AT MEAN TEMPERATURE OF 75 DEG F. APPLY TO THE FOLLOWING PIPING IN THICKNESS INDICATED: 2 INCH AND SMALLER: 1/2 INCH.
 - B. ACCEPTABLE MANUFACTURERS: GLASS FIBER PIPE COVERING, CALCIUM SILICATE, AND THERMAL INSULATING WOOL: MANVILLE, OWENS-CORNING, MANSON, KNAUF.
- 1.8 INSULATION APPLICATION - GENERAL
 - A. DO NOT INSULATE PIPING UNTIL SATISFACTORY COMPLETION OF REQUIRED PRESSURE TESTS.
 - B. APPLY INSULATION TO CLEAN, DRY SURFACES WITH PIPE SURFACES AT ROOM TEMPERATURE.
 - C. BUTT INSULATION FIRMLY TOGETHER WITH LONGITUDINAL AND END JOINTS SEALED WITH COMPATIBLE JACKETS, FACINGS AND ADHESIVES AS SPECIFIED.
 - D. APPLY ADHESIVES, MASTICS AND COATINGS PER MANUFACTURER'S RECOMMENDATIONS AND AS SPECIFIED.
 - E. ON COLD SURFACES WHERE VAPOR BARRIER JACKETS ARE USED, APPLY INSULATION WITH A CONTINUOUS, UNBROKEN VAPOR SEAL.
 - F. INSULATION REQUIREMENT SHOULD COMPLY WITH CALIFORNIA STATE ENERGY CODE 2022, REFER BELOW TABLE FOR MINIMUM PIPE INSULATION THICKNESS ACC. TO CALIFORNIA PLUMBING CODE 2022 SECTION 609.12, 2022 CALIFORNIA ENERGY CODE 2022 SECTION 120.3

- 1.2 PIPING AUXILIARIES/SPECIALTIES
 - A. GENERAL: ALL AUXILIARIES AND SPECIALTIES SHALL BE GUARANTEED BY THE MANUFACTURER FOR THE PRESSURE, TEMPERATURE AND MATERIALS BEING HANDLED, AND SHALL BE SUITABLE FOR THE PIPING TO WHICH THEY ARE ATTACHED.
 - B. VENT FLASHINGS: FURNISH 6 LB. LEAD FLASHING FOR GENERAL CONTRACTOR INSTALLATION. FLASHING SHALL EXTEND 12 INCHES IN ALL DIRECTIONS, SEALED BETWEEN ROOFING PLIES, EXTENDED UP TO END OF VENT AND CLAMPED WITH VANDALPROOF VENT CAP.
 - C. HUBLESS CAST IRON COUPLINGS: SHIELD CONSTRUCTED OF TYPE 301 OR 304 STAINLESS STEEL MEETING ASTM A167-84. NEOPRENE GASKETS SHALL CONFORM TO ASTM C564. COUPLINGS SHALL HAVE A MINIMUM OF 2 SCREWDRIVER BANDS. THE USE OF SEALANT OR ADHESIVES ON COUPLINGS IS NOT PERMITTED UNLESS APPROVED BY THE MANUFACTURER. MANUFACTURERS: CLAMP-ALL, HUSKY, TYLER, MISSION, AND CHARLOTTE.
- 1.3 CLEANOUTS
 - A. GENERAL: CAPABLE OF ADJUSTMENT TO MATCH FINISH SURFACE. BE ROUND. ALL COVER PLATES/PLUGS SHALL BE PERMANENTLY LABELED TO MATCH THE DRAIN SERVICE. FINISHED FLOOR: CAST IRON FITTINGS, CAST IRON CLEAN-OUT MANUFACTURERS: JOSAM, J.R. SMITH, WADE, ZURN, WATTS OR EQUIVALENT. FINISHED FLOOR AND TILE FLOOR: J. R. SMITH FIG. 4020, DUOCO CAST IRON BODY AND FRAME WITH ROUND ADJUSTABLE SCORIATED NICKEL BRONZE TOP. TOP LABELLED CO. PROVIDE NICKEL BRONZE CARPET CLAMPING FRAME WITH VANDALPROOF SCREW IN CARPETED AREAS.
 - C. UNFINISHED FLOOR AND EQUIPMENT AREA FLOOR: J. R. SMITH FIG. 4240, DUOCO CAST IRON BODY AND FRAME WITH ROUND ADJUSTABLE SCORIATED CAST IRON TOP. TOP LABELLED CO.
 - D. WALL CLEANOUT: J. R. SMITH FIG. 4422, DUOCO CAST IRON CAULK FERRULE WITH VAST BRONZE TAPER THREAD PLUG AND PRIME-COATED STEEL SHALL COVER VANDALPROOF SCREWS.

- 1.4 FLASHINGS - INSTALLATION
 - A. GENERAL: ALL PENETRATIONS OF ROOFS AND SIMILAR AREAS REQUIRED FOR INSTALLATION OF VENTS, ROOF DRAINS, AND PIPING UNDER THIS DIVISION SHALL BE PROPERLY FLASHED AND MADE WATERTIGHT. COORDINATE WITH ALL NECESSARY GENERAL TRADES WORK SUFFICIENTLY IN ADVANCE AND INSTALL IN CONJUNCTION WITH ROOFING INSTALLATION.
 - B. FLASHING OF VENT AND SOIL PIPE EXTENSIONS: ALL VENT AND SOIL PIPE EXTENSIONS THROUGH ROOF SHALL BE MINIMUM 3-INCH SIZE AND FLASHED WITH 6 LB. SHEET LEAD OR 16 OZ COPPER, 24-INCH SQUARE, WITH SLEEVE SOLDERED

MINIMUM PIPE INSULATION THICKNESS				
FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)	
	CONDUCTIVITY BTU IN / (H·FT ² ·°F)	MEAN RATING TEMPERATURE	<1	1 to <4
141-200	0.25-0.29	125	1.5	1.5 2
105-140	0.22-0.28	100	1.0	1.5 1.5

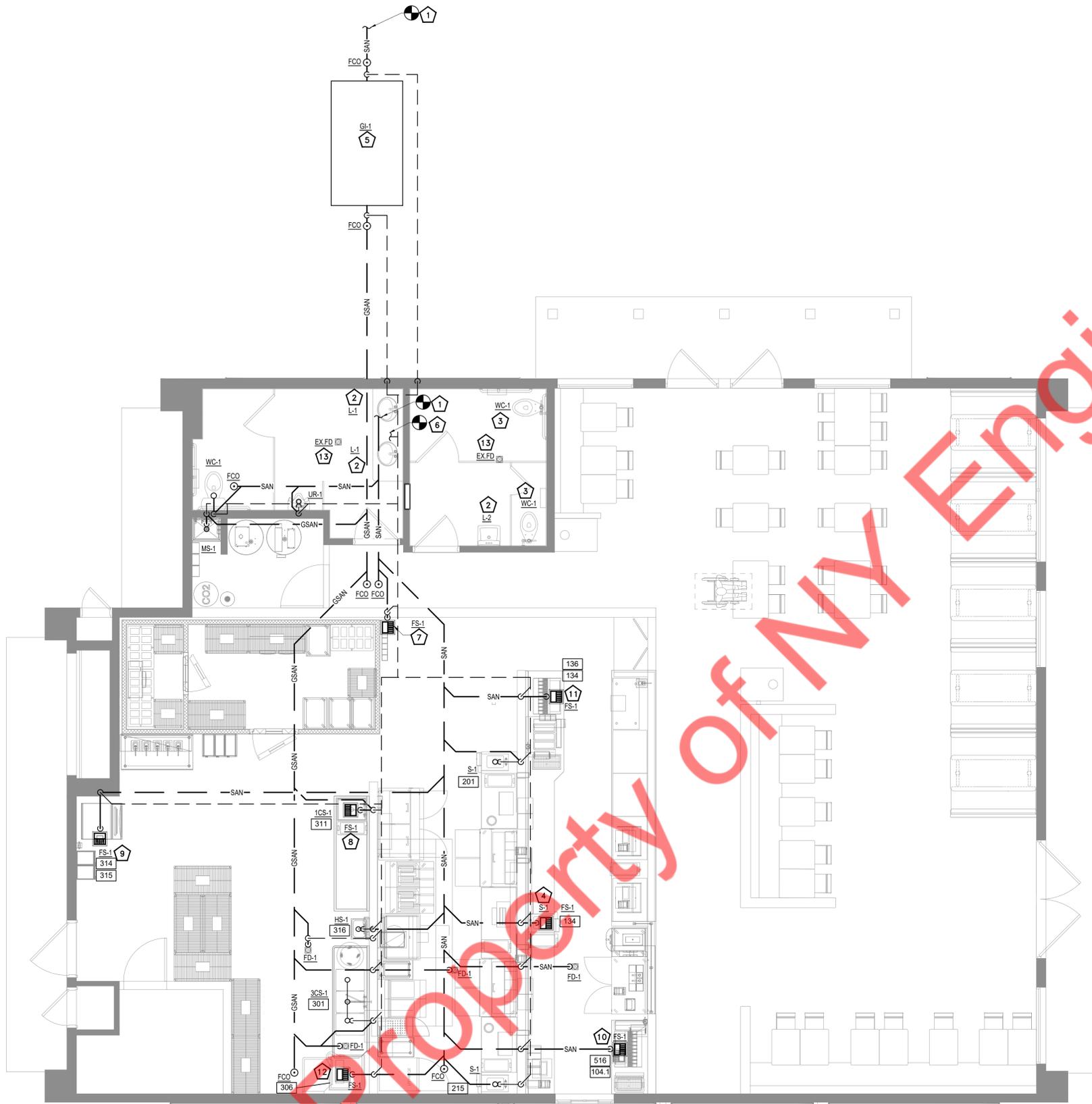


GENERAL NOTES

1. PLUMBING CONTRACTOR TO VERIFY AND COORDINATE EXACT STREET PRESSURE, LOCATION OF METER AND PIPE ROUTING FROM METER TO PROJECT AREA TO ENSURE MINIMUM SUPPLY GPM AND PRESSURE FOR PROPER OPERATION ARE MET. NOTIFY ARCHITECT IN WRITING FOR CLARIFICATION PRIOR TO SUBMISSION OF BIDS.
2. EXACT LOCATION OF PLUMBING FIXTURES SHALL BE DETERMINED FROM ARCHITECTURAL DRAWINGS.
3. BEFORE SUBMITTING BID, THE PLUMBING CONTRACTOR SHALL REVIEW THE ARCHITECTURAL DRAWINGS AND INCLUDE IN HIS BID AN AMOUNT TO FURNISH AND INSTALL ANY FIXTURES WHICH ARE SHOWN IN ADDITION TO FIXTURES SHOWN ON THE PLUMBING DRAWINGS.
4. CONTRACTOR SHALL VERIFY AND COORDINATE LOCATION OF ALL PLUMBING LINES WITH DUCTWORK AND ELECTRICAL SERVICES.
5. THE INSTALLATION OF ALL VALVES, UNIONS, THERMOMETERS, GAUGES, OR OTHER INDICATING OR RECORDING EQUIPMENT, OR SPECIALTIES REQUIRING FREQUENT READING, REPAIRS, ADJUSTMENT, INSPECTION, REMOVAL OR REPLACEMENT SHALL BE CONVENIENTLY AND ACCESSIBLY LOCATED WITH REFERENCE TO THE FINISHED BUILDING.
6. CONTRACTOR SHALL NOT CUT HOLES IN STRUCTURAL MEMBERS WITHOUT FIRST SECURING WRITTEN APPROVAL FROM THE ARCHITECT.
7. CONTRACTOR SHALL INSTALL DIELECTRIC UNIONS AT CONNECTIONS OF DISSIMILAR METALS.
8. CONTRACTOR SHALL ROUGH-IN ALL WASTES AND SUPPLIES TO SPECIAL EQUIPMENT ACCORDING TO MANUFACTURERS SHOP DRAWINGS AND MAKE FINAL CONNECTIONS. ALL SUPPLIES SHALL BE VALVED.
9. CAP/REMOVE ALL UNUSED EXISTING WATER AND GAS PIPING. COORDINATE WITH THE ARCHITECT.
10. WATER SUPPLY TO CARBONATORS SHALL BE PROTECTED BY A REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION DEVICE THAT IS APPROVED FOR USE WITH CARBONATORS (STAINLESS STEEL, IS TESTABLE, AND LEAD FREE. ALL BACKFLOW DEVICES SHALL BE INSTALLED SO THAT THEY ARE ACCESSIBLE FOR REPAIR AND TESTING, IN COMPLIANCE WITH CALIFORNIA PLUMBING CODE STANDARDS.
11. POTABLE WATER SUPPLY TO BEVERAGE DISPENSERS CARBONATED BEVERAGE DISPENSERS, OR COFFEE MACHINES SHALL BE PROTECTED BY AN AIR GAP OR A VENTED BACKFLOW PREVENTER THAT COMPLIES WITH ASSE 1022. FOR CARBONATED BEVERAGE DISPENSERS, PIPING MATERIAL INSTALLED DOWNSTREAM OF THE BACKFLOW PREVENTER SHALL NOT BE AFFECTED BY CARBON DIOXIDE GAS. (CPC 603.5.12)
12. WATER SUPPLY AND DRAIN PIPES UNDER ACCESSIBLE LAVATORIES AND SINKS SHALL BE INSULATED OR OTHERWISE BE CONFIGURED TO PROTECT AGAINST CONTACT. PROTECTORS, INSULATORS OR BOTH SHALL COMPLY WITH ASME A112.18.9. CPC 403.3.
13. PRIOR TO UTILIZATION OF NEWLY CONSTRUCTED OR ALTERED POTABLE WATER PIPING SYSTEMS, ALL AFFECTED POTABLE WATER PIPING SHALL BE DISINFECTED USING PROCEDURES PRESCRIBED IN CALIFORNIA PLUMBING CODE SECTIONS 609.9(1) THROUGH 609.9(4).
14. REFER RISERS FOR PIPE SIZES

KEY NOTES

1. CONNECT NEW 4" SANITARY LINE TO EXISTING SANITARY LINE IN SPACE. CONTRACTOR TO FIELD VERIFY EXISTING SANITARY SIZE, ROUTING, CONDITION AND INVERT PRIOR TO BID.
2. EXISTING LAVATORY TO BE REPLACED WITH NEW LAVATORY. EXISTING SANITARY, VENT WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY CONDITION OF EXISTING PIPING, REPLACE IF REQUIRED.
3. EXISTING WATER CLOSET TO BE REPLACED WITH NEW WATER CLOSET. EXISTING SANITARY, VENT WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY CONDITION OF EXISTING PIPING, REPLACE IF REQUIRED.
4. INDIRECT WASTE FROM SINK TO FLOOR SINK WITH APPROVED AIR GAP.
5. NEW 1000 GALLONS GREASE INTERCEPTOR. CONTRACTOR TO INSTALL GREASE INTERCEPTOR AS PER MANUFACTURER RECOMMENDATION AND LOCAL GUIDELINES. CONTRACTOR TO COORDINATE GREASE INTERCEPTOR FINAL LOCATION WITH LANDLORD.
6. NEW 3" VENT LINE CONNECT TO EXISTING VENT LINE IN SPACE. CONTRACTOR VERIFY EXISTING VTR EXACT LOCATION AND SIZE.
7. CONDENSATE DRAIN PIPE FROM WALK IN COOLER EVAPORATOR DISCHARGE TO FLOOR SINK WITH APPROVED AIR GAP.
8. INDIRECT WASTE FROM 1 COMPARTMENT SINK TO FLOOR SINK WITH APPROVED AIR GAP.
9. INDIRECT WASTE FROM ICE BIN FOR ICE MACHINE AND NUGGET ICE MAKER TO FLOOR SINK WITH APPROVED AIR GAP.
10. INDIRECT WASTE FROM SODA DISPENSER TO FLOOR SINK WITH APPROVED AIR GAP.
11. INDIRECT WASTE FROM SODA DISPENSER WITH ICE BIN TO FLOOR SINK WITH APPROVED AIR GAP.
12. INDIRECT WASTE FROM DISHWASHER TO FLOOR SINK WITH APPROVED AIR GAP.
13. EXISTING FLOOR DRAIN WITH EXISTING SANITARY, VENT WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY CONDITION OF EXISTING PIPING AND FIXTURE, REPLACE IF REQUIRED.





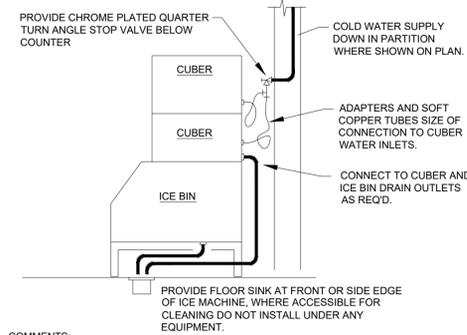
GENERAL NOTES

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5. THE INSTALLATION OF ALL VALVES, UNIONS, THERMOMETERS, GAUGES, OR OTHER INDICATING OR RECORDING EQUIPMENT, OR SPECIALTIES REQUIRING FREQUENT READING, REPAIRS, ADJUSTMENT, INSPECTION, REMOVAL OR REPLACEMENT SHALL BE CONVENIENTLY AND ACCESSIBLY LOCATED WITH REFERENCE TO THE FINISHED BUILDING.
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10. WATER SUPPLY TO CARBONATORS SHALL BE PROTECTED BY A REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION DEVICE THAT IS APPROVED FOR USE WITH CARBONATORS (STAINLESS STEEL), IS TESTABLE, AND LEAD FREE. ALL BACKFLOW DEVICES SHALL BE INSTALLED SO THAT THEY ARE ACCESSIBLE FOR REPAIR AND TESTING, IN COMPLIANCE WITH CALIFORNIA PLUMBING CODE STANDARDS.
11. POTABLE WATER SUPPLY TO BEVERAGE DISPENSERS CARBONATED BEVERAGE DISPENSERS, OR COFFEE MACHINES SHALL BE PROTECTED BY AN AIR GAP OR A VENTED BACKFLOW PREVENTER THAT COMPLIES WITH ASSE 1022. FOR CARBONATED BEVERAGE DISPENSERS, PIPING MATERIAL INSTALLED DOWNSTREAM OF THE BACKFLOW PREVENTER SHALL NOT BE AFFECTED BY CARBON DIOXIDE GAS. (CPC 603.5.12)
12. WATER SUPPLY AND DRAIN PIPES UNDER ACCESSIBLE LAVATORIES AND SINKS SHALL BE INSULATED OR OTHERWISE BE CONFIGURED TO PROTECT AGAINST CONTACT. PROTECTORS, INSULATORS OR BOTH SHALL COMPLY WITH ASME A112.18.9. CPC 403.3.
13. PRIOR TO UTILIZATION OF NEWLY CONSTRUCTED OR ALTERED POTABLE WATER PIPING SYSTEMS, ALL AFFECTED POTABLE WATER PIPING SHALL BE DISINFECTED USING PROCEDURES PRESCRIBED IN CALIFORNIA PLUMBING CODE SECTIONS 609.9(1) THROUGH 609.9(4).
14. ALL WATER SUPPLY LINES TO BE COPPER ABOVE GRADE.
15. REFER RISERS FOR PIPE SIZES

KEY NOTES

- 1 EXISTING MOP SINK TO BE REPLACED WITH NEW MOP SINK. EXISTING WATER PIPING WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF PIPING. REPLACE IF REQUIRED.
- 2 EXISTING LAVATORY TO BE REPLACED WITH NEW LAVATORY. EXISTING WATER PIPING WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF PIPING. REPLACE IF REQUIRED. PROVIDE HWR RETURN LINE AS SHOWN IF NOT EXISTING.
- 3 EXISTING WATER CLOSET TO BE REPLACED WITH NEW WATER CLOSET. EXISTING WATER PIPING WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF PIPING. REPLACE IF REQUIRED.
- 4 EXISTING WATER HEATER WITH EXISTING WATER PIPING WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF WATER HEATER AND PIPING. REPLACE IF REQUIRED.
- 5 PROVIDE ASSE. 1070 APPROVED TEMPERING VALVE FOR HAND SINK. SET TEMPERATURE TO A MAXIMUM OF 110° F.
- 6 CONNECT NEW 2" CW TO EXISTING WATER METER AND BFP. CONTRACTOR TO FIELD VERIFY WATER LINE SIZE, LOCATION.
- 7 CONNECT NEW 2" GAS LINE TO EXISTING GAS METER. CONTRACTOR TO FIELD VERIFY EXISTING GAS METER CAPACITY IS EQUAL TO OR GRATER THAN 940 CFH. UPGRADE GAS METER IF REQUIRED. COORDINATE ALL WORK WITH UTILITY COMPANY AND LANDLORD.
- 8 CONTRACTOR TO FIELD VERIFY EXISTING AVAILABLE GAS PRESSURE AND MAKE SURE TO PROVIDE ADEQUATE INLET PRESSURE REQUIRED FOR GAS FIRED EQUIPMENT.
- 9 1/2" CW CONNECTION TO FILTER SYSTEM.
- 10 1" NATURAL GAS CONNECTION TO FRYER BATTERY.
- 11 3/4" NATURAL GAS CONNECTION TO GRIDDLE.
- 12 3/4" NATURAL GAS CONNECTION TO MULTIPLE FRYER SYSTEM
- 13 PROVIDE 1/2" CW TO WATER FILTER AND ICE MAKER. PROVIDE ASSE 1022 APPROVED BFP FOR CARBONATOR.
- 14 EXTEND AND CONNECT NEW 1/2" CW SUPPLY TO MAU-1(N).
- 15 CONTRACTOR TO TO FIELD VERIFY AVAILABILITY OF EXISTING EXPANSION TANK AND RECIRCULATION PUMP. PROVIDE NEW AS SHOWN, IF NOT EXISTING.
- 16 GAS PIPING RUNNING ON ROOF.
- 17 PROVIDE 1/2" CW TO WATER FILTER AND ICE MAKER. PROVIDE ASSE 1012 APPROVED WATTS LF9D BFP FOR ICE MAKER.

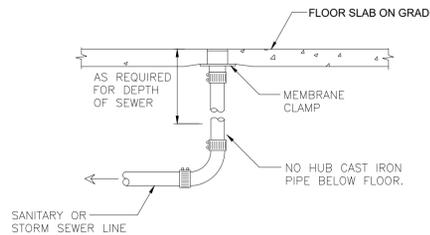




- COMMENTS:
1. PROVIDE COLD WATER ROUGH-IN AT FRONT OF ICE MACHINE. ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST AS REQUIRED TO SUIT CONDITIONS. VERIFY CONNECTIONS WITH MANUFACTURER.
 2. INSTALL WATER FILTERS PER MANUFACTURER'S INSTRUCTIONS.

ICE MACHINE PIPING SCHEMATIC

3



- NOTE:
1. PROVIDE ROUND SECURED NICKEL BRONZE ADJUSTABLE TOP WITH "CO" CAST IN COVER.
 2. PROVIDE CLEANOUT TOP WITH VARIATIONS SUITABLE FOR FLOOR COVERING (CARPET MARKER, RECESSED FOR TILE, SCORIFIED FOR UNFINISHED FLOORS).
 3. PROVIDE PLASTIC PLUG IN CAST IRON BODY.
 4. CLEAN THE TOP OF EXPOSED FCO AFTER INSTALLATION.

FLOOR CLEANOUT

2

INDIRECT WASTE PIPING AND WASTE RECEPTORS

CPC SECTION 803.0 EXCEPT AS HEREINAFTER PROVIDED, THE SIZE AND CONSTRUCTION OF INDIRECT WASTE PIPING SHALL BE IN ACCORDANCE WITH OTHER SECTIONS OF THIS CODE APPLICABLE TO DRAINAGE AND VENT PIPING.

NO VENT FROM INDIRECT WASTE PIPING SHALL COMBINE WITH ANY SEWER-CONNECTED VENT, BUT SHALL EXTEND SEPARATELY TO THE OUTSIDE AIR.

INDIRECT WASTE PIPES EXCEEDING FIVE (5) FEET BUT LESS THAN FIFTEEN (15) FEET IN LENGTH SHALL BE DIRECTLY TRAPPED, BUT SUCH TRAPS NEED NOT BE VENTED.

INDIRECT WASTE PIPES LESS THAN FIFTEEN (15) FEET IN LENGTH SHALL BE NOT LESS THAN THE DIAMETER OF THE DRAIN OUTLET OR TAILPIECE OF THE FIXTURE, APPLIANCE, OR EQUIPMENT SERVED, AND IN NO CASE LESS THAN ONE-HALF OF AN INCH.

ANGLES AND CHANGES OF DIRECTION IN SUCH INDIRECT WASTE PIPES SHALL BE PROVIDED WITH CLEANOUTS SO AS TO PERMIT FLUSHING AND CLEANING.

CPC SECTION 804.1 NO INDIRECT WASTE RECEPTOR SHALL BE INSTALLED IN ANY TOILET ROOM, CLOSET, CUPBOARD, OR STOREROOM, NOR IN ANY OTHER PORTION OF A BUILDING NOT IN GENERAL USE BY THE OCCUPANTS THEREOF, EXCEPT STANDPIPES FOR CLOTHES WASHERS SHALL BE PERMITTED TO BE INSTALLED IN TOILET AND BATHROOM AREAS WHEN THE CLOTHES WASHER IS INSTALLED IN THE SAME ROOM.

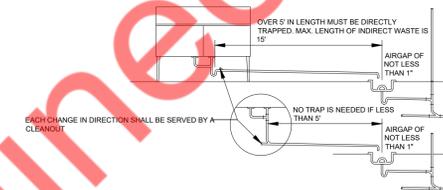
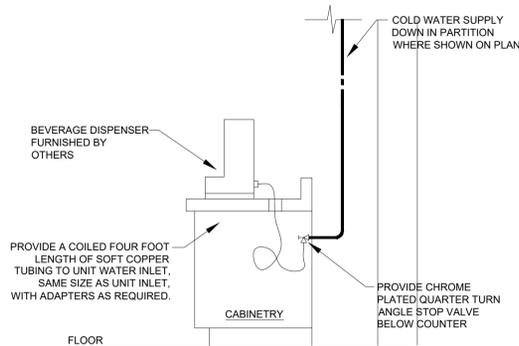
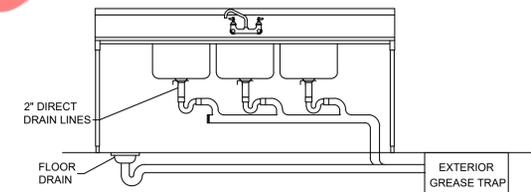


FIGURE 8-11: INDIRECT WASTE PIPING UPC ITM 8-7

INDIRECT WASTE PIPING HANDOUT

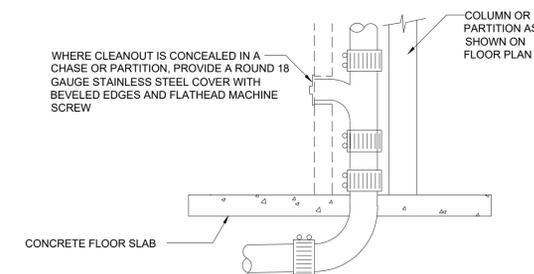
1



- COMMENTS:
1. ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST AS REQUIRED TO SUIT CONDITIONS. VERIFY CONNECTIONS WITH MANUFACTURER.

BEVERAGE WATER PIPING SCHEMATIC

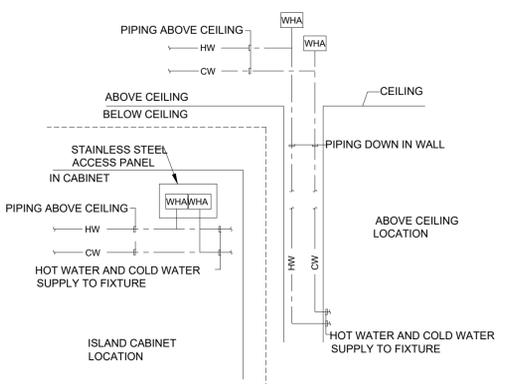
6



- NOTE:
1. PROVIDE WOO WHERE SHOWN ON PLAN.
 2. CLEANOUT FACE SHALL TERMINATE AT WALL SURFACE. PROVIDE PIPE EXTENSION IF REQUIRED.

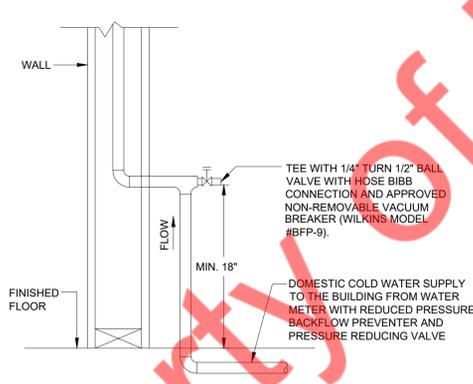
WALL CLEANOUT

5



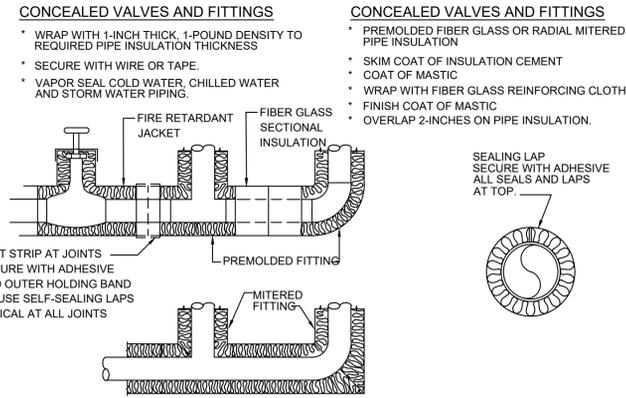
TYPICAL WATER HAMMER ARRESTOR DETAIL

9



DRAIN DOWN VALVE DETAIL

8



INSULATION OF PIPING, VALVES AND FITTING FOR EXPOSED AND CONCEALED LOCATIONS

7

801.3 FOOD AND BEVERAGE HANDLING ESTABLISHMENTS

ESTABLISHMENTS ENGAGED IN THE STORAGE, PREPARATION, SELLING, SERVING, PROCESSING, OR OTHER HANDLING OF FOOD AND BEVERAGE INVOLVING THE FOLLOWING EQUIPMENT THAT REQUIRES DRAINAGE SHALL PROVIDE INDIRECT WASTE PIPING FOR REFRIGERATORS, REFRIGERATION COILS, FREEZERS, WALK-IN COOLERS, ICEBOXES, ICE-MAKING MACHINES, STEAM TABLES, EGG BOILERS, COFFEE URNS AND BREWERS, HOT-AND-COLD DRINK DISPENSERS, AND SIMILAR EQUIPMENT.

801.3.1 SIZE OF INDIRECT WASTE PIPES

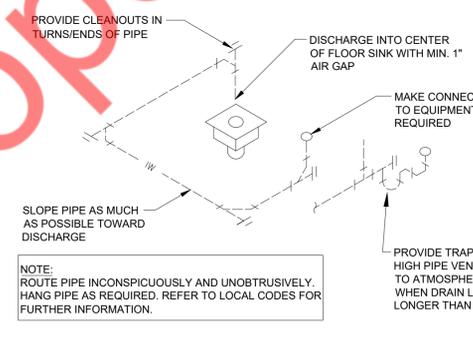
EXCEPT FOR REFRIGERATION COILS AND ICE-MAKING MACHINES, THE SIZE OF THE INDIRECT WASTE PIPE SHALL BE NOT SMALLER THAN THE DRAIN ON THE UNIT, BUT SHALL BE NOT SMALLER THAN 1 INCH (25 MM), AND THE MAXIMUM DEVELOPED LENGTH SHALL NOT EXCEED 15 FEET (4572 MM). INDIRECT WASTE PIPE FOR ICE-MAKING MACHINES SHALL BE NOT LESS THAN THE DRAIN ON THE UNIT AND IN NO CASE LESS THAN 3/4 OF AN INCH (20 MM).

801.3.2 WALK-IN COOLERS

FOR WALK-IN COOLERS, FLOOR DRAINS SHALL BE PERMITTED TO BE CONNECTED TO A SEPARATE DRAINAGE LINE DISCHARGING INTO AN OUTSIDE RECEPTOR. THE FLOOD-LEVEL RIM OF THE RECEPTOR SHALL BE NOT LESS THAN 6 INCHES (152 MM) LOWER THAN THE LOWEST FLOOR DRAIN. SUCH FLOOR DRAINS SHALL BE TRAPPED AND INDIVIDUALLY VENTED. CLEANOUTS SHALL BE PROVIDED AT 90 DEGREE (1.57 RAD) TURNS AND SHALL BE ACCESSIBLY LOCATED. SUCH WASTE SHALL DISCHARGE THROUGH AN AIR GAP OR AIR BREAK INTO A TRAPPED AND VENTED RECEPTOR, EXCEPT THAT A FULL-SIZE AIR GAP IS REQUIRED WHERE THE INDIRECT WASTE PIPE IS UNDER VACUUM.

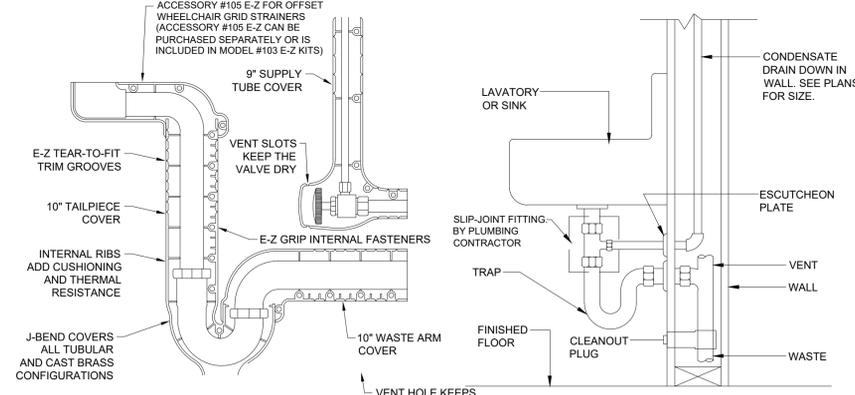
801.3.3 FOOD-HANDLING FIXTURES

FOOD-PREPARATION SINKS, STEAM KETTLES, POTATO PEELERS, ICE CREAM DIPPER WELLS, AND SIMILAR EQUIPMENT SHALL BE INDIRECTLY CONNECTED TO THE DRAINAGE SYSTEM BY MEANS OF AN AIR GAP. BINS, SINKS, AND OTHER EQUIPMENT HAVING DRAINAGE CONNECTIONS AND USED FOR THE STORAGE OF UNPACKAGED ICE USED FOR HUMAN INGESTION, OR USED IN DIRECT CONTACT WITH READY-TO-EAT FOOD, SHALL BE INDIRECTLY CONNECTED TO THE DRAINAGE SYSTEM BY MEANS OF AN AIR GAP. EACH INDIRECT WASTE PIPE FROM FOOD-HANDLING FIXTURES OR EQUIPMENT SHALL BE SEPARATELY PIPED TO THE INDIRECT WASTE RECEPTOR AND SHALL NOT COMBINE WITH OTHER INDIRECT WASTE PIPES. THE PIPING FROM THE EQUIPMENT TO THE RECEPTOR SHALL BE NOT LESS THAN THE DRAIN ON THE UNIT AND IN NO CASE LESS THAN 1/2 OF AN INCH (15 MM).



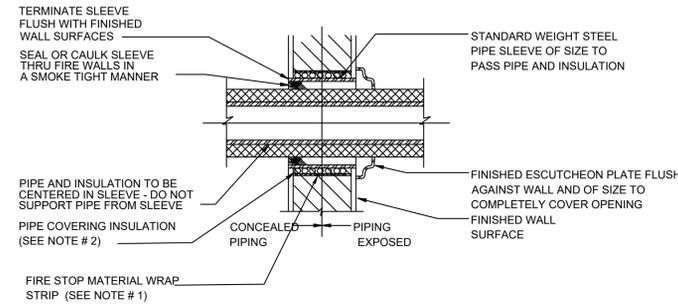
INDIRECT WASTE EQUIPMENT CONNECTION

11

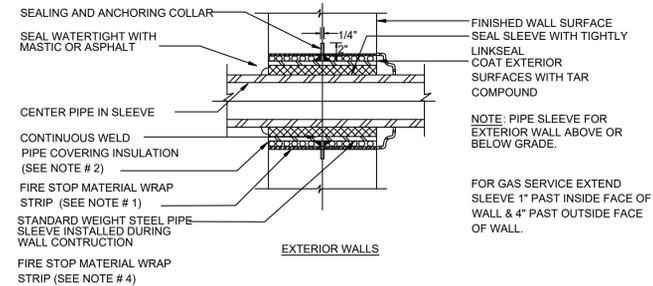


TYPICAL CONNECTION AT LAVATORY FIXTURE WITH UNDERSINK WRAP

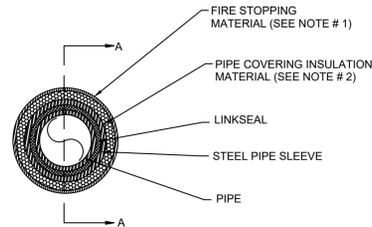
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INTERIOR WALLS



EXTERIOR WALLS



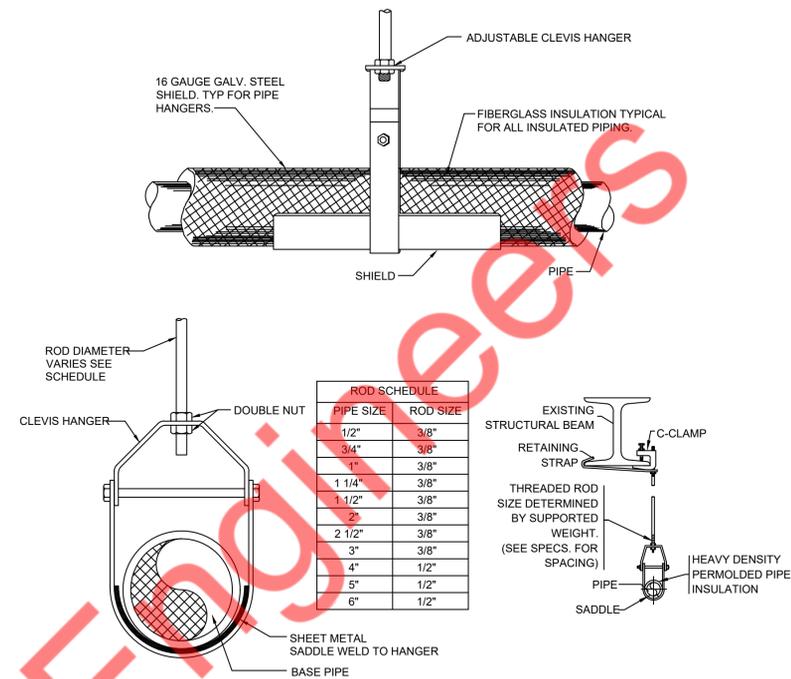
PIPE SLEEVE VIEW

NOTES:

1. FIRESTOP MATERIAL WRAP STRIP SHALL BE 1/2" THICK INTUMESCENT ELASTOMERIC MATERIAL FACED ON ONE SIDE WITH ALUMINUM FOIL SUPPLIED IN 2 IN. WIDE STRIPS AND WRAP AROUND THE PIPE AS PER UL MATERIAL LISTED 3M COMPANY FS-195+ OR FILL CAVITY WITH CAULK OR SEALANT MIN. 1/4" DIA. CONTINUOUS BEAD APPLIED TO THE WRAP STRIP/WALL INTERFACE AND TO THE EXPOSED OF THE WRAP STRIP LAYER APPROX. 3/4" FROM WALL SURFACE. AS PER UL LISTED 3M COMPANY CP25WB+, IC 15WB+, FIRE DAM 150+CAULK.
2. PIPE COVERING INSULATION SHALL BE 2" THICK HOLLOW CYLINDRICAL HEAVY DENSITY GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKETED. AS PER UL CLASSIFICATION AND MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.
3. DETAILS ARE ONLY DIAGRAMMATIC WITH RESPECT TO PENETRATION PROTECTION REQUIRED IN ACCORDANCE WITH SECTION 714 OF 2020 FLORIDA BUILDING CODE, 7TH EDITION. A LISTED PENETRATION FIRESTOP SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND THE LISTING CRITERIA.

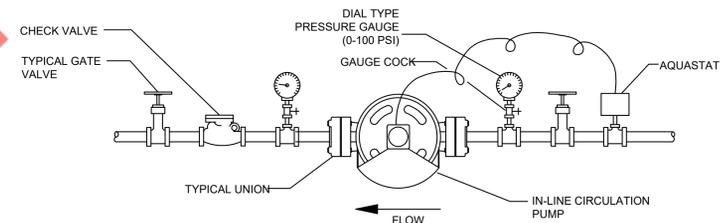
PIPE SLEEVE THRU WALL SECTION

2



PIPE HANGER

1



INLINE RECIRCULATING PUMP

3

Property of NYE



LOW PRESSURE GAS PIPE SIZING CHART

PIPE SIZE	LOAD (CFH)
1/2"	52
3/4"	110
1"	207
1-1/4"	424
1-1/2"	635
2"	1220
2-1/2"	1,950

OPERATING PRESSURE OF 7"-14" WC WITH A PRESSURE DROP OF 0.5" WC
 TOTAL DEVELOPED LENGTH = 87 FEET
 TOTAL CONNECTED LOAD = 937 CFH
 BASED ON 2019 CPC TABLE 1215.2(1)

TAG	FIXTURE	MANUFACTURER / MODEL	FINISH	PIPE SIZE				REMARKS
				CW	HW	SAN	VENT	
3CS-1	3-COMP SINK	JL STAINLESS	STAINLESS STEEL	3/4"	3/4"	3"	2"	--
1CS-1	1-COMP SINK	JL STAINLESS	STAINLESS STEEL	3/4"	3/4"	3"	1 1/2"	--
S-1	SINK	JL STAINLESS	STAINLESS STEEL	3/4"	3/4"	2"	1 1/2"	--
HS-1	WALL MOUNTED HAND SINK	JOHN BOOS PBHS-W-1410-P	STAINLESS STEEL	1/2"	1/2"	2"	1 1/2"	ENAMELED- CAST IRON WITH VACUUM BREAKER, SEE KITCHEN EQUIPMENT SCHEDULE
MS-1	MOP SINK	--	--	E	E	3"	2"	EXISTING TO REMAIN.
FS-1	FLOOR SINK	ZURN #Z1900-18	WHITE PORCELAIN ENAMEL	--	--	3"	2"	EXISTING TO REMAIN.
FD-1	FLOOR DRAIN	ZURN #Z415-B	CAST IRON W/ NICKEL BRONZE TOP	--	--	3"	2"	CAST IRON BODY WITH BOTTOM OUTLET, INVERTIBLE MEMBRANE CLAMP AND ADJUSTABLE COLLAR WITH 7" DIAMETER TYPE "B" NICKEL BRONZE ROUND STRAINER. PROVIDE WITH TRAP SEAL GUARD
WC-1	WATER CLOSET	AMERICAN STANDARD: TOILET:3043.001.020 FLUSH VALVE: 6065.121.002	WHITE VITREOUS CHINA	1"	--	4"	2"	FLOOR MOUNTED, VITREOUS CHINA, 1.28 GPF, TOP SPUD, ELONGATED WATER CLOSET WITH LITHIUM BATTERY POWERED FLUSH VALVE. PROVIDE WITH MANUFACTURERS RECOMMENDED ANGLE SUPPLY STOPS AND OTHER INSTALLATION MATERIALS.
L-1 & L-2	WALL MOUNTED LAVATORY	UNLIMITED 46 WALL MOUNTED / VESSEL SINK UNLIMITED 46.03	GLOSSY WHITE	E	E	E	E	WALL MOUNTED ADA COMPLIANT. PROVIDE OVERFLOW, ANGLE SUPPLIES, 1/2" TMV SET TO 110°F, P-TRAP, #103 E-Z PLUMBEREX4444 LAVGUARD. PROVIDE WITH MOEN 8559 BL ELECTRONIC BATTERY POWERED 0.5 GPM FAUCET.
UR-1	WALL MOUNTED URINAL	AMERICAN STANDARD 6036.051.002	WHITE VITREOUS CHINA	3/4"	--	2"	1 1/2"	WALL MOUNTED, VITREOUS CHINA, 0.125 GPF, TOP SPUD URINAL. PROVIDE WITH WATER HAMMER ARRESTER ON CW LINE.
EX.GWH	EXISTING TANK TYPE WATER HEATER	EXISTING TO REMAIN	--	E	E	--	--	EXISTING TO REMAIN.
RCP-1	RECIRCULATING PUMP	TACO	--	--	--	--	--	BRONZE FLANGE CONNECTIONS, BRONZE CASING, 120V-1/8 HP-1.76 AMPS. PROVIDE TACO "00" AQUASTAT & TIMER FOR PUMP OPERATION. AQUASTAT AND TIMER EACH REQUIRES A SEPERATE 115V-60-1 ELECTRICAL CONNECTION. (PROVIDE IF NOT EXISTING)
BV-1	CALIBRATED BALANCE VALVE	BELL & GOSSETT	--	--	--	--	--	FURNISH AND INSTALL AS SHOWN ON PLANS AND WITH MANUFACTURERS RECOMMENDATIONS MODEL CB CALIBRATED BALANCE VALVES.
MV-1	MIXING VALVE	LEONARD #SERIES 210	--	--	--	--	--	FURNISH AND INSTALL AS SHOWN ON PLANS AND WITH MANUFACTURERS RECOMMENDATIONS MODEL CB CALIBRATED BALANCE VALVES. SET MIXING VALVE TO 110°F.
ET-1	EXPANSION TANK	AMTROL THERM-X-TROL ST-8	--	--	--	--	--	FURNISH AND INSTALL AS SHOWN ON PLANS AND WITH MANUFACTURERS RECOMMENDATIONS. CAPACITY 3.2 GALLONS AND DIMENSION - 9" DIA X 15" HEIGHT, WEIGHT 7 LBS, CONNECTION 3/4" NPTM. MAXIMUM OPERATING TEMPRATURE IS 100°F (PROVIDE IF NOT EXISTING)
HB-1	HOSE BIB	ZURN Z1300	--	3/4"	--	--	--	--
TP	TRAP PRIMER	PPP INC. PR-500	--	1/2"	--	--	--	--
FCO	FLOOR CLEANOUT	ZURN Z-1400	--	--	--	--	--	--

PLUMBING CODE FIXTURE UNIT SCHEDULE (COLD WATER)

WATER CALCULATION (BASED ON 2022 CPC)	# OF FIXTURES	MIN. FIXTURE BRANCH PIPE SIZE	PRIVATE	PUBLIC	ASSEMBLY	TOTAL FIXTURE UNITS
LAVATORY	3	1/2"		1.0		3.0
KITCHEN (HANDSINK / HS-1)	2	1/2"		2.0		4.0
KITCHEN (PRE-RINSE SINK/S-1)	2	1/2"		1.5		3.0
KITCHEN (3-COMPARTMENT SINK / 3CS-1)	1	3/4"		1.5		1.5
KITCHEN (1-COMPARTMENT SINK / 1CS-1)	1	3/4"		1.5		1.5
SERVICE OR MOP BASIN(MS-1)	1	3/4"		3.0		3.0
URINAL, 1.0 GPF	1	3/4"		4.0		4.0
WATER CLOSET, 1.6 GPF FLUSHOMETER VALVE	3	1 1/4"		5.0		15.0
NUGGET ICE MAKER	1	1/2"		0.5		0.5
CARBONATOR	2	1/2"		0.5		1.0
TRAP PRIMER	0	1/2"		0.5		0.0
HOSE BIB	1	3/4"		2.5		2.5

TOTAL FIXTURE UNITS	39
GPM	45
INCOMING LINE SIZE	2"

NOTE: VELOCITY IN COLD WATER PIPE LIMITED TO 8 FT/SEC. VELOCITY IN HOT WATER PIPE LIMITED TO 5 FT/SEC.

SIZE (INCHES)	MINIMUM SLOPE (INCH / FOOT)
4 OR LESS	1/4
6	1/8
8 OR LARGER	1/16

CONDITION/LOCATION	MATERIAL TYPE
ABOVE GROUND WATER	TYPE "L" COPPER
BELOW GROUND WATER	TYPE "K" COPPER
WASTE (UNDER GROUND)	CAST IRON PIPE
WASTE (ABOVE GROUND)	CAST IRON PIPE
VENT (UNDER GROUND)	CAST IRON PIPE
VENT (ABOVE GROUND)	CAST IRON PIPE
GAS PIPING	SCH. 40 WROUGHT IRON
CONDENSATE PIPING	SCHED. 40 PVC PLASTIC

TOTAL CONNECTED NATURAL GAS LOAD

EQUIPMENT DESIGNATION	QTY.	DESCRIPTION	PRESSURE RANGE	CFH
KITCHEN EQUIPMENT				
225	1	FRYER BATTERY	7"-14" WC	244
231	1	GRIDDLE	7"-14" WC	85
234	1	MULTIPLE FRYER SYSTEM	7"-14" WC	150
TOTAL				479
MECHANICAL EQUIPMENT				
EX.GWH	1	EXISTING WATER HEATER		199
RTU-1(N)	1	ROOF TOP UNIT		125
RTU-2(N)	1	ROOF TOP UNIT		67
RTU-3(N)	1	ROOF TOP UNIT		67
TOTAL				458
TOTAL CONNECTED LOAD				937

NATURAL GAS SYSTEM OPERATING PRESSURE OF 7-14 INCHES WC
 NATURAL GAS SYSTEM SIZED WITH TOTAL DEVELOPED LENGTH FROM GAS METER TO MOST REMOTE PIECE OF EQUIPMENT OF 87' WITH A PRESSURE DROP OF 0.5 INCHES W.C.

PLUMBING CODE FIXTURE SCHEDULE (SANITARY WASTE)

WASTE WATER CALCULATION (BASED ON 2022 CPC)	# OF FIXTURES	PUBLIC	TOTAL FIXTURE UNITS
LAVATORY	3	1.0	3.0
URINAL, 1.0 GPF	1	2.0	2.0
WATER CLOSET, 1.6 GPF FLUSHOMETER VALVE	3	6.0	18.0
FLOOR SINK	2	2.0	4.0
FLOOR DRAIN	3	2.0	6.0
HAND SINK	2	2.0	4.0
TOTAL FIXTURE UNITS			37.0

GREASE INTERCEPTOR SIZING

FIXTURE	# OF FIXTURES	DFU PER FIXTURE	TOTAL DFU
KITCHEN (3-COMPARTMENT SINK / 3CS-1)	1	6	6
KITCHEN (1-COMPARTMENT SINK / 1CS-1)	1	3	3
MOP SINK / MS-1	1	6	6
FLOOR DRAIN	2	6	12
TOTAL LOAD			27

GREASE INTERCEPTOR : 1000 GALLONS
 REFER TO TABLE 1014.3.6 2022 CALIFORNIA PLUMBING CODE

GRAVITY GREASE INTERCEPTOR SIZING

DRAINAGE FIXTURE UNITS (DFUs)	INTERCEPTOR VOLUME (GALLONS)
8	500
21	700
35	1000
90	1250
172	1500
216	2000

WATER HAMMER ARRESTER SCHEDULE

PDI SIZE	FIXTURE UNITS	MODEL
A	1 - 11	SIOUX CHIEF 652-AS
B	12 - 32	SIOUX CHIEF 653-BS
C	35 - 60	SIOUX CHIEF 654-CS
D	61 - 115	SIOU X CHIEF 655-DS
E	114 -154	SIOUX CHIEF 656-ES
F	155 - 330	SIOUX CHIEF 657-FS

WATER HAMMER ARRESTERS SHALL BE SEAMLESS, PISTON-TYPE, SIZED AND INSTALLED IN ACCORDANCE PDI-WH201. INSTALL WATER HAMMER ARRESTER IN STANDARD TEE, SAME SIZE AS CONNECTED PIPING. AIR CHAMBERS ALL NOT BE PERMITTED.

WATER PRESSURE CALCULATION

AVAILABLE PRESSURE	APPROXIMATE -	40 PSI
PRESSURE ACROSS METER	LOSS -	4 PSI
STATIC PRESSURE (ELEVATION) (12' X 0.43)	LOSS -	5.16 PSI
MINIMUM PRESSURE TO BE MAINTAINED	LOSS -	15 PSI
BACKFLOW PREVENTER (2" RPZ)	LOSS -	12 PSI
TOTAL PRESSURE AVAILABLE		3.84 PSI
DISTANCE FROM METER TO LAST FIXTURE		
		88'
TOTAL DEVELOPED LENGTH OF SYSTEM (X 1.25)		
		110'
FRICTION LOSS / 100 FEET (AVAILABLE PRESSURE / TOTAL DEVELOPED LENGTH) X 100		
		3.5PSI
AVAILABLE PRESSURE		0.34 PSI

