

HVAC REPLACEMENT HUMBOLDT COUNTY REGIONAL FACILITY

EUREKA, CALIFORNIA

CONSTRUCTION DOCUMENTS

September 20, 2024

SCOPE OF WORK

THE MECHANICAL SCOPE OF WORK FOR THE PROJECT CONSISTS OF THE REPLACEMENT OF ONE ROOFTOP AC UNIT WITH A NEW HIGH EFFICIENCY SPLIT SYSTEM WITH A ROOF MOUNTED CONDESING UNIT. ADDITIONALLY THREE ROOFTOP GAS-FIRED MAKE-UP AIR UNITS WILL BE REPLACED IN KIND WITH NEW GAS-FIRED MAKE-UP AIR UNITS.

THE ELECTRICAL SCOPE OF WORK INCLUDES THE CONNECTION OF THE NEW EQUIPMENT TO EXISTING ELECTRICAL INFRASTRUCTURE, ADDING A NEW CIRCUIT FOR THE NEW SPLIT SYSTEM AIR HANDLING UNIT, AND CONNECTION OF NEW EQUIPMENT INTO EXISTING FACILITY CONTROL AND FIRE ALARM SYSTEMS.

THE STRUCTURAL SCOPE OF WORK INCLUDES CURB MODIFICATIONS FOR NEW ROOFTOP EQUIPMENT AND SUPPORTS FOR NEW AIR HANDLING UNIT.

PROJECT NOTICE

THE FINAL DESIGN DOCUMENTS ARE INTENDED TO BE USED AS A COMPLETE PACKAGE. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO FURNISH ANY SUBCONTRACTORS, MATERIAL OR EQUIPMENT SUPPLIERS ACCESS TO THE TOTAL BID PACKAGE OF FINAL DESIGN DOCUMENTS. ALL OF THE DOCUMENTS APPLY TO ALL MEMBERS OF THE GENERAL CONTRACTOR CONSTRUCTION TEAM.

THE ARCHITECT AND ENGINEERS HAVE SHOWN VARIOUS PORTIONS OF THE WORK ON SEPARATE SHEETS OF DRAWINGS OR IN SEPARATE PROJECT SPECIFICATION SECTIONS FOR CLARITY. SUCH SEPARATION SHALL NOT BE CONSIDERED AS THE LIMITS OF THE WORK REQUIRED OF ANY SEPARATE TRADE. THE TERMS AND CONDITIONS OF SUCH LIMITATIONS ARE WHOLLY BETWEEN THE CONTRACTOR AND HIS SUB- CONTRACTORS.

THE FINAL PROJECT SHALL REFLECT ALL THE WORK SHOWN ON ALL DOCUMENTS WITHOUT REGARD TO WHO SHALL PROVIDE THE WORK. FOR PURPOSES OF THIS PROJECT THE ARCHITECT / ENGINEER / OWNER SHALL CONSIDER THE GENERAL CONTRACTOR AS THE SOLE PROVIDER OF ALL ITEMS NECESSARY TO COMPLETE THE PROJECT.

ITEMS SHOWN ON ONE DRAWING OR SPECIFICATION SECTION BUT NOT OTHERS SHALL BE FURNISHED IN THEIR ENTIRETY AS IF SHOWN ON ALL DOCUMENTS. - THE USE OF THESE DOCUMENTS WITHOUT THE BENEFIT OF REVIEWING THE ENTIRE PACKAGE WILL BE AT THE RISK OF THE USER.

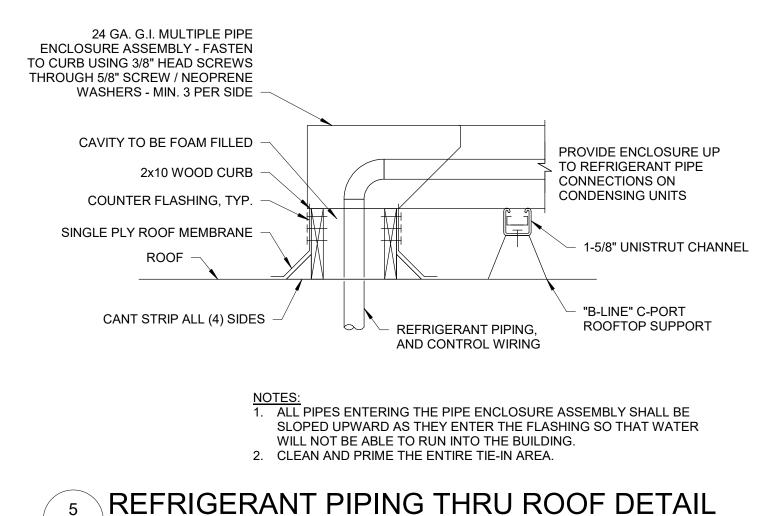
SHEET INDEX

Sheet Number	Sheet Name
GENERAL	
G100	TITLE SHEET
MECHANICAL	
M100	MECHANICAL LEGEND, SCHEDULES, AND DETAILS
M101	MECHANICAL SPECIFICATIONS
M102	TAB SPECIFICATIONS
M103	CONTROL SPECIFICATIONS
M200	MECHANICAL DEMOLITION PLAN
M210	MECHANICAL DEMOLITION ROOF PLAN
M220	MECHANICAL FLOOR PLAN
M240	MECHANICAL ROOF PLAN
M400	TITLE 24 COMPLIANCE
ELECTRICAL	
E100	ELECTRICAL LEGENDS AND SCHEDULES
E101	ELECTRICAL SPECIFICATIONS
E210	ELECTRICAL FLOOR PLAN
E240	ELECTRICAL ROOF PLAN
PLUMBING	
P100	PLUMBING LEGENDS AND DETAILS
P210	PLUMBING DEMOLITION ROOF PLAN
P220	PLUMBING FLOOR PLAN
P240	PLUMBING ROOF PLAN
TOTAL SHEETS 18	

TOTAL SHEETS: 18

+ -	
	FRONTIER CONSULTING ENGINEERS
	2727 Bechelli Lane - Redding, CA 96002 Ph: (530) 232-6160 - www.frontierce.com
	ALL IDEAS, DESIGNS, AND PLANS REPRESENTED BY THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF FRONTIER CONSULTING ENGINEERS, INC. AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION. ANY UNAUTHORIZED REUSE OF THIS DRAWING SHEET OTHER THAN FOR THE PROJECT AND LOCATION SHOWN IS PROHIBITED.
-	LICENSE STAMP
	EPROFESSION P
	LED XEXT. 05-31-2026 0 5 STATE OF CALIFORNIA
-	
1	KEY PLAN
-	PROJECT NAME
	HVAC REPLACEMENT
	FOR
	HUMBOLDT COUNTY REGIONAL FACILITY
	2004 HARRISON AVENUE EUREKA, CA 95501
	NO. REVISIONS DATE
-	
	TITLE SHEET
	ISSUED FOR: CONSTRUCTION DOCUMENTS
	DATE: 9/20/2024 DRAWN BY: WG
	REVIEWED BY:NWSCALE:As indicatedPROJECT NO:22007
	G100

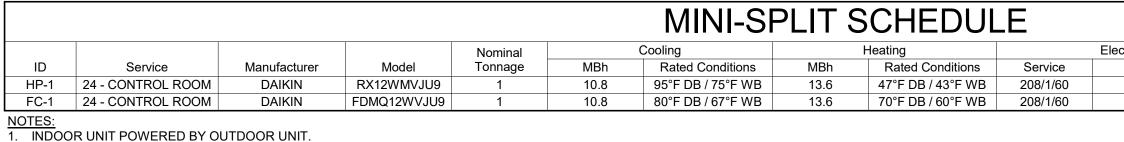
N	IECHAN	NICAL LEGEND
SYMBOLS	ABBREVIATIONS	
	ABC	ABOVE CEILING
	AFF	ABOVE FINISHED FLOOR
AD	AD	ACCESS DOOR
	AL	ACOUSTIC LINED DUCT (DIM IS INTERNAL)
	AC	AIR CONDITIONING
	BHP	BRAKE HORSE POWER
	CFM	CUBIC FEET PER MINUTE
A123		DIFFUSER TAG
	D	DEMO
	DB	DRY BULB
2 12/8 2		DUCT (RECTANGULAR DUCT, DIMENSIONS IN INCHES)
		DUCT (ROUND DUCT, DIAMETER IN INCHES)
		DUCT DROP IN DIRECTION OF ARROW
		DUCT RISE IN DIRECTION OF ARROW
	EER	ENERGY EFFICIENCY RATIO
	EAT	ENTERING AIR TEMPERATURE
T EA T	EA	EXHAUST AIR DUCT
	EF	EXHAUST FAN
		EXHAUST GRILLE
	(E), EX	EXISTING
	ESP	EXTERNAL STATIC PRESSURE
	FPM	FEET PER MINUTE
		FLEXIBLE DUCT
	FLA	FULL LOAD AMPS
	LAT	LEAVING AIR TEMPERATURE
— L — N, — —		LOUVERED DOOR
	МОСР	MAXIMUM OVER CURRENT PROTECTION
	MCA	MINIMUM CIRCUIT AMPACITY
 [M]		MOTORIZED DAMPER
	(N)	NEW
$\mathbf{\Theta}$		NEW CONNECTION TO EXISTING
	OA	OUTSIDE AIR
		REGISTER/GRILLE TAG
	(R), R	RELOCATE
		REMOVE TO THIS POINT
	RA	RETURN AIR DUCT
		RETURN GRILLE
	RL/RS	REFRIGERANT LINE SET
	SEER	SEASONAL ENERGY EFFICIENCY RATIO
SD	SD	SMOKE DETECTOR
Z SA Z	SA	SUPPLY AIR DUCT
		SUPPLY DIFFUSER
Ō	T'STAT	THERMOSTAT (48" AFF TOP OF BOX)
	TSP	TOTAL STATIC PRESSURE
		TURNING VANES
N	TYP	TYPICAL
-UC		UNDERCUT DOOR
	UG	UNDERGROUND
	VIF	VERIFY IN FIELD
		VOLUME DAMPER - MANUAL OPERATION
	WB	WET BULB



M100 NOT TO SCALE

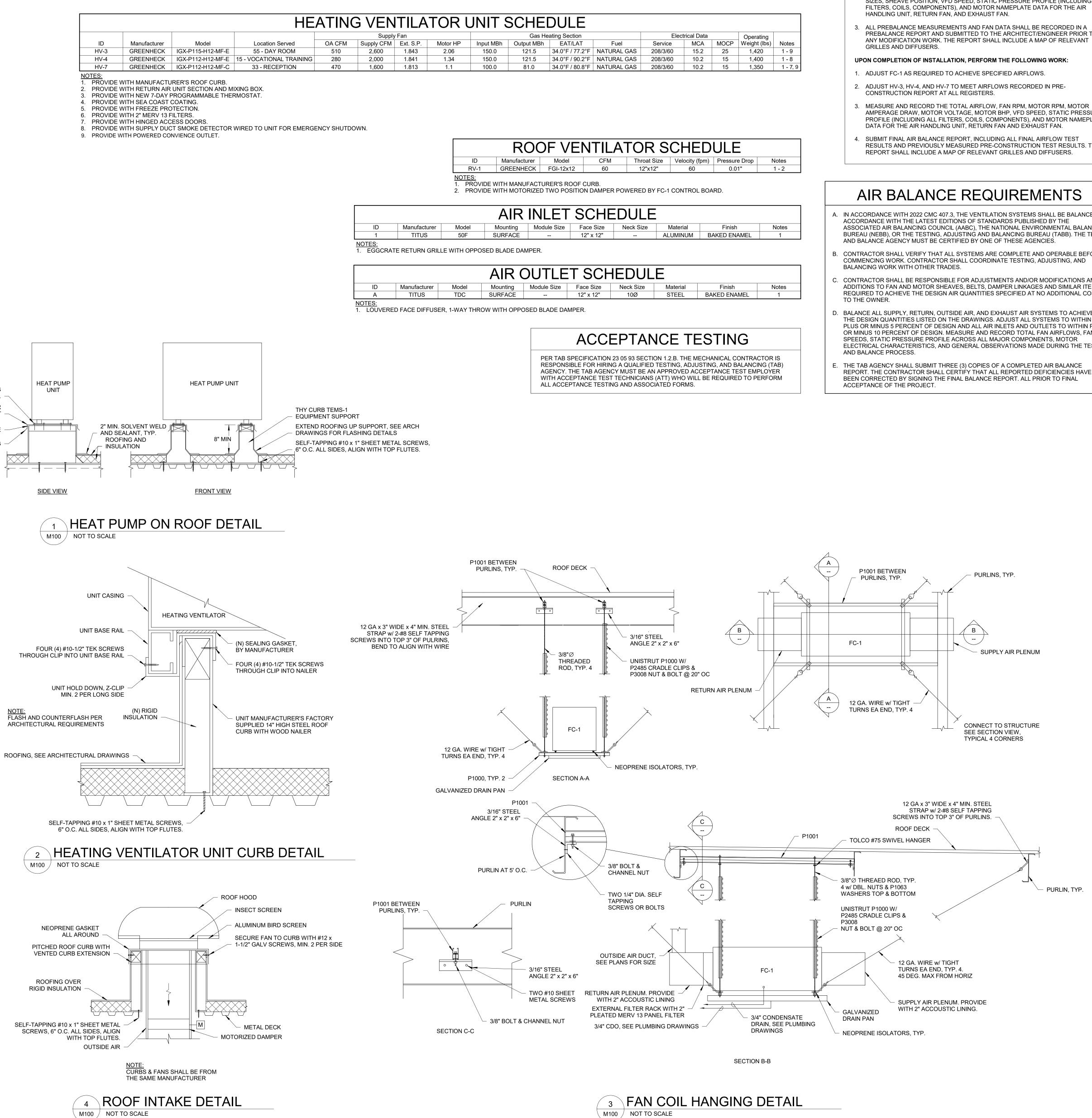
WITH 3" MIN EMBED, TYP. 24 GA G.I. FLASHING CAP SOLDER ALL JOINTS WATER TIGHT BONDING ADHESIVE COUNTER FLASHING

(2) - 3/8"ø LAG SCREWS



. PROVIDE WITH DACA-CP3-1 CONDENSATE PUMP. 3. DIVERSITECH CONDENSATE CS-2 SWITCH WIRED TO UNIT FOR OVERFLOW PROTECTION.

4. PROVIDE 7-DAY PROGRAMMABLE THERMOSTAT. 5. PROVIDE ALL NECESSARY REFRIGERATION PIPING AND APPURTENANCES.



ectrical Data				
MCA	MOCP	Dimensions	Weight (lbs)	Notes
7.7	15	21-5/8"H x 26-9/16"W x 11-3/16"D	75	
		9-5/8"H x 27-9/16"W x 31-1/2"D	75	1 - 5

=[DULE						
He	ating Section		Elect	rical Data		Operating	
٦	EAT/LAT	Fuel	Service	MCA	MOCP	Weight (lbs)	Notes
	34.0°F / 77.2°F	NATURAL GAS	208/3/60	15.2	25	1,420	1 - 9
	34.0°F / 90.2°F	NATURAL GAS	208/3/60	10.2	15	1,400	1 - 8
	34.0°F / 80.8°F	NATURAL GAS	208/3/60	10.2	15	1,350	1 - 7, 9

OF VENTILATOR SCHEDULE	
------------------------	--

_ET	SC	HE	Dl	JLI	

dule Size	Face Size	Neck Size	Material	Finish	Notes
	12" x 12"		ALUMINUM	BAKED ENAMEL	1

ule Size	Face Size	Neck Size	Material	Finish	Notes
	12" x 12"	10Ø	STEEL	BAKED ENAMEL	1
	MDED				

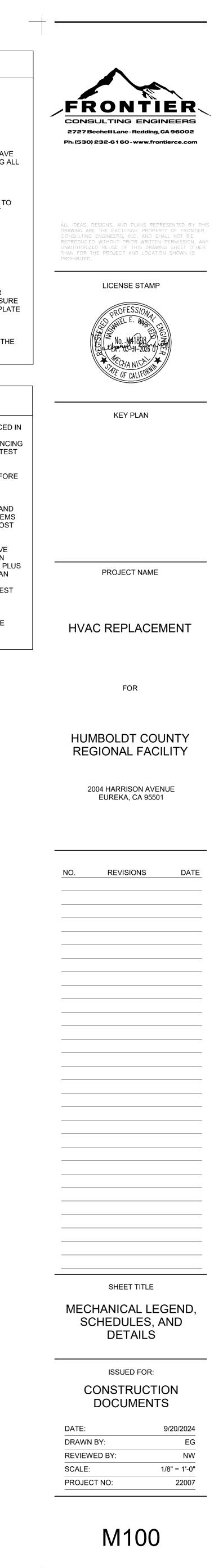
AIR BALANCE PROCEDURES

THIS PROJECT INCLUDES BALANCING FOR SYSTEMS: FC-1, HV-3, HV-4, AND HV-7 PRIOR TO COMMENCING WORK, PERFORM THESE MEASUREMENTS:

- MEASURE AIRFLOW AT ALL EXISTING CEILING SUPPLY DIFFUSERS, RETURN GRILLES, AND EXHAUST GRILLES.
- MEASURE AND RECORD THE TOTAL AIRFLOW, OUTSIDE AIRFLOW, FAN RPM, MOTOR RPM, MOTOR AMPERAGE DRAW, MOTOR VOLTAGE, MOTOR BHP, SHEAVE SIZES, SHEAVE POSITION, VFD SPEED, STATIC PRESSURE PROFILE (INCLUDING ALL FILTERS, COILS, COMPONENTS), AND MOTOR NAMEPLATE DATA FOR THE AIR
- ALL PREBALANCE MEASUREMENTS AND FAN DATA SHALL BE RECORDED IN A PREBALANCE REPORT AND SUBMITTED TO THE ARCHITECT/ENGINEER PRIOR TO ANY MODIFICATION WORK. THE REPORT SHALL INCLUDE A MAP OF RELEVANT

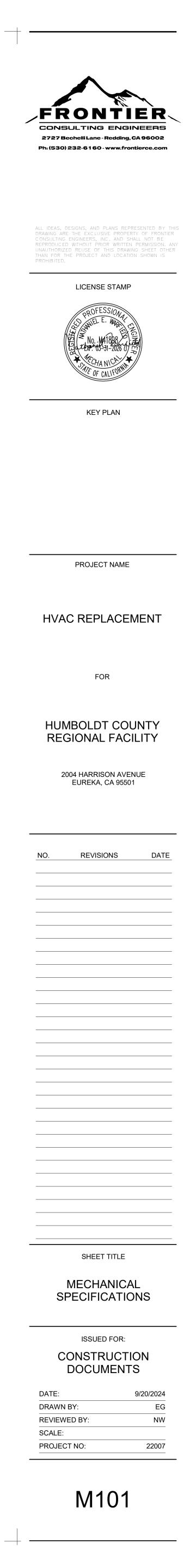
- AMPERAGE DRAW, MOTOR VOLTAGE, MOTOR BHP, VFD SPEED, STATIC PRESSURE PROFILE (INCLUDING ALL FILTERS, COILS, COMPONENTS), AND MOTOR NAMEPLATE
- RESULTS AND PREVIOUSLY MEASURED PRE-CONSTRUCTION TEST RESULTS. THE

- . IN ACCORDANCE WITH 2022 CMC 407.3, THE VENTILATION SYSTEMS SHALL BE BALANCED IN ASSOCIATED AIR BALANCING COUNCIL (AABC), THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB), OR THE TESTING, ADJUSTING AND BALANCING BUREAU (TABB). THE TEST
- . CONTRACTOR SHALL VERIFY THAT ALL SYSTEMS ARE COMPLETE AND OPERABLE BEFORE COMMENCING WORK. CONTRACTOR SHALL COORDINATE TESTING, ADJUSTING, AND
- CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTMENTS AND/OR MODIFICATIONS AND ADDITIONS TO FAN AND MOTOR SHEAVES, BELTS, DAMPER LINKAGES AND SIMILAR ITEMS REQUIRED TO ACHIEVE THE DESIGN AIR QUANTITIES SPECIFIED AT NO ADDITIONAL COST
- BALANCE ALL SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST AIR SYSTEMS TO ACHIEVE THE DESIGN QUANTITIES LISTED ON THE DRAWINGS. ADJUST ALL SYSTEMS TO WITHIN PLUS OR MINUS 5 PERCENT OF DESIGN AND ALL AIR INLETS AND OUTLETS TO WITHIN PLUS OR MINUS 10 PERCENT OF DESIGN. MEASURE AND RECORD TOTAL FAN AIRFLOWS, FAN SPEEDS, STATIC PRESSURE PROFILE ACROSS ALL MAJOR COMPONENTS, MOTOR ELECTRICAL CHARACTERISTICS, AND GENERAL OBSERVATIONS MADE DURING THE TEST
- THE TAB AGENCY SHALL SUBMIT THREE (3) COPIES OF A COMPLETED AIR BALANCE REPORT. THE CONTRACTOR SHALL CERTIFY THAT ALL REPORTED DEFICIENCIES HAVE BEEN CORRECTED BY SIGNING THE FINAL BALANCE REPORT. ALL PRIOR TO FINAL



	MECHANICAL S	SPECIFICATION	
 1.1 INCLUDED A. THIS SECTION COVERS MECHANICAL WORK, COMPLETE. WORK INCLUDES FURNISHING, INSTALLING, CALIBRATING, ADJUSTING, TESTING, DOCUMENTING, AND STARTING UP EQUIPMENT 	 OPERATING AND MAINTENANCE INSTRUCTIONS FURNISH THREE SETS OF TYPEWRITTEN INSTRUCTIONS COVERING MAINTENANCE, ADJUSTMENT, AND OPERATION OF EACH PIECE OF APPARATUS, BOUND IN A HARD COVER LOOSE-LEAF BINDER. NEATLY OBSCURE OR CROSS OUT INAPPLICABLE DATA FROM MANUFACTURER'S LITERATURE. SUBMIT DATA TO THE ARCHITECT. 	D. SUPPORTS – SUPPORTS FOR HORIZONTAL DUCTS AND PLENUMS SHALL BE FABRICATED PER FIGURES 5-5 AND 5-6 AND TABLES 5-1, 5-2, AND 5-3. THE MAXIMUM DISTANCE BETWEEN HANGERS SHALL BE EIGHT FEET FOR RECTANGULAR DUCTS AND TWELVE FEET FOR ROUND DUCTS. ATTACHMENTS TO THE STRUCTURE SHALL BE MADE WITH ADEQUATELY SIZED LAG BOLTS FOR STRAPHANGERS AND ADEQUATELY SIZED MACHINE BOLTS AND SIDE BEAM BRACKETS FOR ROD HANGERS. SUPPORTS FOR VERTICAL DUCTS SHALL BE BAND IRON STRAP OR ANGLE BRACKET	 D. CONCRETE AND TILED SURFACES: INRYCO/MILCOR, STYLE M, PRIME COATED STEEL, EXCEPT ACCESS PANELS INSTALLED IN TILED SURFACES SHALL BE STAIN FINISH STAINLESS STEEL. MINIMUM SIZE SHALL BE 12" X 12". PROVIDE LARGER SIZES WHERE REQUIRED. LOCKS SHALL BE FLUSH SCREWDRIVER OPERATED. E. PLASTERED SURFACES: INRYCO/MILCOR, STYLE K, PRIME COATED STEEL. MINIMUM SIZE SHALL
 IN ACCORDANCE WITH THESE SPECIFICATIONS, THE ACCOMPANYING PLANS, AND THE DIRECTIONS OF THE ENGINEER. 1.2 CODES AND STANDARDS 	B. OPERATING INSTRUCTIONS SHALL SHOW SEQUENCE OF OPERATIONS, LUBRICATION, CARE, AND MAINTENANCE REQUIREMENTS OF ALL EQUIPMENT. FINAL ACCEPTANCE OF THE WORK WILL NOT BE MADE UNTIL A SATISFACTORY SUBMISSION OF THIS MATERIAL IS RECEIVED AND APPROVED BY THE ARCHITECT.	 TYPE PER FIGURE 5-8 AND 5-9. E. DUCT ACCESS DOORS: INCLUDING THOSE FOR REMOVING FILTERS, DUCT ACCESS DOORS SHALL BE AS DETAILED IN FIGURE 7-2 WITH SASH LOCKS, PIANO HINGES, AND GASKETS. ACCESS DOORS SHALL HAVE AN UNOBSTRUCTED FULL SWING. 	BE 12" X 12". PROVIDE LARGER SIZES WHERE REQUIRED. LOCKS SHALL BE FLUSH SCREWDRIVER OPERATED. PART 3 – EXECUTION
 A. ALL WORK SHALL BE DONE IN COMPLIANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL BUILDING SAFETY CODES, ORDINANCES, AND REGULATIONS. ADDITIONALLY, ALL WORK SHALL CONFORM TO THE LATEST EDITIONS OF THE FOLLOWING STANDARDS: 1. NATIONAL FIRE PROTECTION ASSOCIATION. 	 C. THE OWNER'S AUTHORIZED REPRESENTATIVE SHALL BE INSTRUCTED IN THE OPERATION AND SERVICING OF ALL HVAC & PLUMBING SYSTEMS. 1.11 ACCURACY OF DATA 	2.4 IDENTIFICATION FOR MECHANICAL SYSTEMS A. LABELS	 INSTALLATION, GENERAL A. PROVIDE ALL NECESSARY CUTTING IN CONNECTION WITH THE WORK OF THE SECTION. NO CUTTING SHALL BE DONE WITHOUT THE APPROVAL OF THE ARCHITECT. COMPLY WITH REQUIREMENTS SPECIFIED IN CUTTING AND PATCHING SECTION.
 CALIFORNIA MECHANICAL CODE. CALIFORNIA PLUMBING CODE. UNDERWRITERS LABORATORIES. TITLES 8, 17, 19, 21, 24 OF THE CALIFORNIA CODE OF REGULATIONS. CALIFORNIA ELECTRIC CODE. SMACNA STANDARDS. 	 ACCORDINGTION DATA A. THE DATA GIVEN HEREIN AND ON THE DRAWINGS ARE AS EXACT AS COULD BE REASONABLY SECURED, BUT ABSOLUTE ACCURACY IS NOT GUARANTEED. EXACT LOCATIONS, DISTANCES, ELEVATIONS, ETC. WILL BE GOVERNED BY SHOP DRAWINGS, THE BUILDING ITSELF, AND ACTUAL FIELD CONDITIONS. 1.12 DAMAGE BY LEAKS 	 VINYL WRAPAROUND LABELS: PREPRINTED, FLEXIBLE LABELS LAMINATED WITH A CLEAR, WEATHER- AND CHEMICAL-RESISTANT COATING AND MATCHING WRAPAROUND CLEAR ADHESIVE TAPE FOR SECURING LABEL ENDS. SNAP-AROUND LABELS: SLIT, PRE-TENSIONED, FLEXIBLE, PREPRINTED, COLOR-CODED ACRYLIC SLEEVES, WITH DIAMETERS SIZED TO SUIT DIAMETERS AND THAT STAY IN PLACE BY GRIPPING ACTION. SELF-ADHESIVE WRAPAROUND LABELS: 3-MIL-THICK, POLYESTER FLEXIBLE LABEL WITH 	 B. NO STRUCTURAL MEMBERS SHALL BE DRILLED, BORED, OR NOTCHED IN A MANNER THAT WILL IMPAIR THEIR STRUCTURAL CAPACITY. C. ALL PENETRATIONS OF CONCRETE OR MASONRY SHALL BE MADE WITH CORE DRILLS. 3.2 EQUIPMENT STARTUP
B. WHEN THE CONTRACT DOCUMENTS CALL FOR MATERIALS OR CONSTRUCTION OF A HIGHER STANDARD THAN IS REQUIRED BY THE ABOVE, THE CONTRACT DOCUMENT REQUIREMENTS SHALL TAKE PRECEDENCE OVER THE REQUIREMENTS OF THE APPLICABLE LAWS, ORDINANCES, RULES, OR REGULATIONS. NOTHING IN THE CONTRACT DOCUMENTS SHALL BE INTERPRETED AS PERMITTING WORK IN VIOLATION OF SAID LAWS, RULES, AND/OR REGULATIONS.	 A. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO WORK OF OTHER CONTRACTORS THAT IS CAUSED BY LEAKS IN ANY TEMPORARY OR PERMANENT PIPING SYSTEMS DUE TO PIPE RUPTURE, DISCONNECTED PIPES OR FITTINGS, OR BY OVERFLOW OF EQUIPMENT. 1.13 SEISMIC FORCE RESISTANCE: MECHANICAL, PLUMBING, FIRE PROTECTION SYSTEMS 	 ACRYLIC PRESSURE-SENSITIVE ADHESIVE. a. SELF-LAMINATION: CLEAR; UV-, WEATHER- AND CHEMICAL-RESISTANT; SELF- LAMINATING, PROTECTIVE SHIELD OVER THE LEGEND. LABELS SIZED SUCH THAT THE CLEAR SHIELD OVERLAPS THE ENTIRE PRINTED LEGEND. b. MARKER FOR LABELS: MACHINE-PRINTED, PERMANENT, WATERPROOF, BLACK INK 	 A. NOTIFY THE OWNER'S REPRESENTATIVE A MINIMUM OF TWO WEEKS PRIOR TO EQUIPMENT STARTUP DATE TO ALLOW FOR OWNER'S PERSONNEL TO BE PRESENT DURING STARTUP. B. MANUFACTURER MUST PROVIDE A SERVICE TECHNICIAN TO SUPERVISE RIGGING OF THE UNITS TO ENSURE PROPER FIT.
C. THE CONTRACTOR FOR THIS WORK SHALL FURNISH, WITHOUT EXTRA CHARGE, ANY ADDITIONAL MATERIALS AND/OR LABOR AS MAY BE REQUIRED FOR COMPLIANCE WITH THESE LAWS, RULES, AND/OR REGULATIONS THOUGH SUCH MATERIALS AND/OR LABOR ARE NOT SPECIALLY SET FORTH IN THE CONTRACT DOCUMENTS.	A. ALL MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS SHALL ADHERE TO THE SMACNA "SEISMIC RESTRAINT MANUAL: GUIDELINES FOR MECHANICAL SYSTEMS," THIRD EDITION DATED MARCH 2008.	RECOMMENDED BY PRINTER MANUFACTURER. 4. SELF-ADHESIVE LABELS: POLYESTER, THERMAL, TRANSFER-PRINTED, 3-MIL-THICK, MULTICOLOR, WEATHER- AND UV-RESISTANT, PRESSURE-SENSITIVE ADHESIVE LABELS, CONFIGURED FOR INTENDED USE AND LOCATION.	C. UNIT MUST BE CHECKED OUT, TESTED AND PLACED INTO OPERATION BY THE INSTALLING CONTRACTOR UNDER THE SUPERVISION OF AN AUTHORIZED REPRESENTATIVE OF THE FACTORY.
 1.3 LICENSING REQUIREMENTS A. ALL WORK OF DIVISION 22 AND 23 SHALL BE PERFORMED BY AN APPROPRIATELY LICENSED CONTRACTOR. THE LICENSES SHALL BE CURRENT, VALID THROUGH THE TERM OF THE CONTRACT AND IN THE NAME OF THE CONTRACTOR. 	 1.14 DELIVERY, STORAGE, AND HANDLING A. CONTRACTOR SHALL BE RESPONSIBLE FOR DELIVERY, STORAGE, PROTECTION, AND PLACING OF ALL EQUIPMENT AND MATERIALS. 1. CONTRACTOR SHALL PROTECT THE WORK AND MATERIALS FROM DAMAGE DURING 	 a. MINIMUM NOMINAL SIZE: 1. 3-1/2 BY 5 INCHES FOR EQUIPMENT. 2. AS REQUIRED BY AUTHORITIES HAVING JURISDICTION. 	 D. CONTROLS CONTRACTOR MUST BE PRESENT DURING STARTUP TO ENSURE THAT FACTORY- INSTALLED CONTROLS HAVE BEEN ADEQUATELY INSTALLED, WIRED, AND INTEGRATED INTO THE BUILDING MANAGEMENTS SYSTEM. E. PROVIDE MINIMUM EIGHT (8) HOURS OF TRAINING TIME WITH OWNER'S MAINTENANCE PERSONNEL TO THOROUGHLY REVIEW NEW EQUIPMENT, MAINTENANCE REQUIREMENTS, AND
 ALL HVAC WORK, WHICH INCLUDES WARM AIR HEATING SYSTEMS AND WATER HEATING PUMPS, VENTILATING SYSTEMS, AIR CONDITIONING SYSTEMS, AND DUCTWORK, REGISTERS, FLUES, HUMIDITY, AND THERMOSTATIC CONTROLS IN CONNECTION WITH THESE SYSTEMS, SHALL BE PERFORMED BY A C-20 – WARM-AIR HEATING, VENTILATING AND AIR-CONDITIONING 		 2.5 DUCTWORK ACCESSORIES A. FLEXIBLE DUCT CONNECTIONS 1. DURO-DYNE "METAL-FAB" WITH DUROION, VENTFABRICS "VENTGLASS," OR APPROVED 	 F. DURING STARTUP, THE FULL FUNCTIONALITY OF THE EQUIPMENT SHALL BE DEMONSTRATED TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE, INCLUDING HEATING, MECHANICAL COOLING, ECONOMIZER COOLING, ZONE MODULATION, AND ALL EMERGENCY SHUTDOWN
 CONTRACTOR. 2. ALL HYDRONIC PIPING SYSTEMS SHALL BE PERFORMED BY A C-4 – BOILER, HOT WATER HEATING AND STEAM FITTING CONTRACTOR. 3. ALL HYDRONIC PIPING INSULATION SHALL BE PERFORMED BY A C-2 – INSULATION AND ACOUSTICAL CONTRACTOR. 	 ANY ITEMS DAMAGED SHALL BE REPAIRED OR REPLACED, AT NO ADDITIONAL COST TO THE OWNER. B. CLEANLINESS OF PIPING AND EQUIPMENT SYSTEMS 	EQUAL. 2. INSTALL AT EACH POINT WHERE A BLOWER UNIT IS CONNECTED TO A DUCT. A MINIMUM CLEARANCE OF THREE INCHES BETWEEN THE DUCT AND THE SOURCE OF VIBRATION SHALL BE MAINTAINED. INSTALL PER FIGURE 2-17.	FEATURES.3.3 EQUIPMENT, GENERAL REQUIREMENTSA. EQUIPMENT SHALL OPERATE QUIETLY AND WITHOUT OBJECTIONABLE VIBRATION. SUCH
 1.4 SUBMITTALS A. SUBMITTAL LISTS AND DRAWINGS SHALL INCLUDE IDENTIFYING MARKS ASSIGNED BY THE DRAWINGS AND SPECIFICATIONS. 	 EXERCISE CARE IN STORAGE AND HANDLING OF EQUIPMENT AND PIPING MATERIAL TO BE INCORPORATED IN THE WORK. REMOVE DEBRIS ARISING FROM CUTTING, THREADING, AND WELDING OF PIPING. PIPING SYSTEMS SHALL BE FLUSHED, BLOWN, OR PIGGED AS NECESSARY TO DELIVER CLEAN SYSTEMS. 	B. SCREENS – INSTALL REMOVABLE BIRD SCREENS AT ALL OUTSIDE INTAKES AND EXHAUST AIR DISCHARGES. SCREENS SHALL BE FABRICATED FROM ½" X 14 GAUGE MESH SECURED IN FULL FRAMES. SCREENS AND FRAMES SHALL BE CONSTRUCTED OF THE SAME MATERIAL AS THE DUCT, HOOD, OR EQUIPMENT TO WHICH ATTACHED.	 PROBLEMS, OTHER THAN FROM EQUIPMENT OPERATING AT OPTIMUM CONDITIONS, SHALL BE THE CONTRACTOR'S RESPONSIBILITY AND SHALL BE ELIMINATED AT THE DIRECTION OF THE ARCHITECT. B. INSTALL EQUIPMENT TO PROVIDE GOOD APPEARANCE, EASY ACCESS, AND ADEQUATE SPACE
QUALITY AND UTILITY. THIS REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF THE	 CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ALL COSTS, DAMAGE, AND DELAY ARISING FROM FAILURE TO PROVIDE CLEAN SYSTEMS. 1.15 WARRANTIES A FOURMENT WARRANTIES SHALL BE PROVIDED FOR ALL FOURMENT, WITH ALL NECESSARY. 	 C. JOINTS – TAPE ALL JOINTS AIRTIGHT USING HARDCAST TYPE "DT" PRESSURELESS TAPE AND "HD-20" ADHESIVE, PER MANUFACTURER'S DIRECTIONS. D. DAMPERS – PROVIDE BUTTERFLY OR MULTI-BLADE DAMPERS WHERE INDICATED ON THE DRAWINGS OR AS REQUIRED FOR BALANCING AIR QUANTITIES TO VALUES SHOWN WITHOUT CONFRATING EXCERNICE DEDVICE DEDVICE DAMPERS WHERE INDICATED ON THE DRAWINGS OR AS REQUIRED FOR BALANCING AIR QUANTITIES TO VALUES SHOWN WITHOUT CONFRATING EXCERNICE DEDVICE DEDVICE DAMPERS IN OR ADDRDOVED FOUND AND THE DRAWINGS OR AS REQUIRED FOR BALANCING AIR QUANTITIES TO VALUES SHOWN WITHOUT 	 TO ALLOW REPLACEMENT AND MAINTENANCE. PROVIDE BASES, SUPPORTS, ANCHOR BOLTS, AND OTHER ITEMS REQUIRED TO ACHIEVE THIS. INSTALLATION SHALL BE LEVEL, ABOVE MOISTURE LEVEL, AND ADEQUATELY BRACED. C. THOROUGHLY LUBRICATE EQUIPMENT BEFORE OPERATING. REPAIR OF DAMAGE RESULTING FROM FAILURE TO COMPLY WITH THIS REQUIREMENT SHALL BE THE CONTRACTORIO.
 RESPONSIBILITY TO FIT THE PROPOSED MATERIALS TO THE SPACES PROVIDED, AND TO EFFECT NECESSARY REARRANGEMENTS OR CONSTRUCTION OF OTHER WORK. C. ALL FIXTURES, MATERIALS, AND EQUIPMENT EQUAL IN QUALITY AND UTILITY TO THESE HEREIN MENTIONED WILL BE ACCEPTED. WHEN SPECIFIC NAMES ARE USED IN DESCRIBING FIXTURES, MATERIALS, AND EQUIPMENT THEY ARE MENTIONED AS STANDARDS ONLY. BUT THIS IMPLIES NO 	 A. EQUIPMENT WARRANTIES SHALL BE PROVIDED FOR ALL EQUIPMENT, WITH ALL NECESSARY INFORMATION FILLED IN, EXCEPT PURCHASE DATE, IN FAVOR OF THE OWNER. B. THE CONTRACTOR SHALL GUARANTEE THAT ALL WORK UNDER THIS SECTION IS FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FILING THE NOTICE OF COMPLETION. REPLACEMENT OF DEFECTIVE WORK AND DAMAGE 	GENERATING EXCESSIVE NOISE. PROVIDE DURO-DYNE "KS-385," OR APPROVED EQUAL, LOCKING QUADRANTS ON EACH MANUAL DAMPER. LOCATE DAMPERS IN FURRED CEILINGS NEAR ACCESS PANELS WHERE POSSIBLE. 1. BUTTERFLY DAMPERS SHALL BE CONSTRUCTED AS PER FIGURE 7-4, FIGURE A, B, AND C IN THE DUCT MANUAL	 FROM FAILURE TO COMPLY WITH THIS REQUIREMENT SHALL BE THE CONTRACTOR'S RESPONSIBILITY. D. CONNECTIONS TO PIPING SHALL BE SECURED AND PROPERLY ALIGNED AND ALL UTILITY AND CONTROL CONNECTIONS SHALL BE PROPERLY ISOLATED FROM THE BUILDING STRUCTURE BY MEANS OF VIBRATION ISOLATOPS AND ELEXIBLE CONNECTIONS. ANY FOURIEMENT NOT MEETING.
MATERIALS, AND EQUIPMENT THEY ARE MENTIONED AS STANDARDS ONLY, BUT THIS IMPLIES NO RIGHT ON THE PART OF THE CONTRACTOR TO USE OTHER FIXTURES, MATERIAL, AND EQUIPMENT OR METHODS, UNLESS APPROVED AS EQUAL IN QUALITY AND UTILITY BY THE ARCHITECT. D. BEFORE ANY FIXTURES, MATERIALS, OR EQUIPMENT ARE PURCHASED. THE CONTRACTOR SHALL	CAUSED TO WORK OF OTHER TRADES AS A RESULT OF SUCH DEFECTIVE WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AND SHALL BE MADE AT NO COST TO THE OWNER.	 THE DUCT MANUAL. 2. MULTI-BLADE DAMPERS SHALL CONFORM TO FIGURE 7-5. 3. BACK-DRAFT DAMPERS SHALL BE AIR BALANCE "AIR DYNAMIC" MODEL DY-1002-V, OR EQUAL. 2.6 INSULATION 	 MEANS OF VIBRATION ISOLATORS AND FLEXIBLE CONNECTIONS. ANY EQUIPMENT NOT MEETING THIS REQUIREMENT WILL BE MODIFIED AND REINSTALLED AT NO EXPENSE TO THE OWNER. E. MOVE EQUIPMENT INTO BUILDING THROUGH AVAILABLE OPENINGS. DISMANTLE EQUIPMENT WHERE NECESSARY TO ACCOMPLISH THIS. AFTER REASSEMBLY, TEST EQUIPMENT TO VERIFY ITS SATISFACTORY OPERATING CONDITION.
 BEFORE ANT FIXTORES, MATERIALS, OR EQUINMENT ARE FOROHADED, THE CONTRACTOR GIALE SUBMIT TO THE ENGINEER FOR APPROVAL, A COMPLETE LIST OF MATERIALS, FIXTURES, AND EQUIPMENT, GIVING THE MANUFACTURER'S NAMES, CATALOG NUMBER, CAPACITY, SIZE, POWER REQUIREMENTS, ETC. E. THE CONTRACTOR SHALL SUBMIT FOR THE APPROVAL OF THE ENGINEER. SHOP DRAWINGS OF 	A. THESE PLANS AND SPECIFICATIONS DESCRIBE THE GENERAL SCOPE OF THE MECHANICAL SYSTEMS. THESE PLANS AND SPECIFICATIONS DO NOT PRECLUDE THE SUBMITTAL OF ALTERNATIVE METHODS OR MATERIALS. MANUFACTURER'S NAMES AND CATALOG NUMBERS ARE STATED TO IDENTIFY THE TYPE AND QUALITY OF THE EQUIPMENT OR MATERIALS REQUIRED FOR THE PROJECT.	 A. EXTERIOR OF DUCTWORK: 1. UNLESS SPECIFIED TO BE LINED, ALL SHEET METAL SUPPLY AND RETURN DUCTS IN INDIRECTLY CONDITIONED SPACES SHALL BE INSULATED ON THE OUTSIDE WITH JOHNS MANVILLE "MICROLITE XG" FLEXIBLE FIBERGLASS BLANKET-TYPE DUCT WRAP, WITH 	 3.4 DUCTWORK A. ALL DUCTWORK SHALL BE INSTALLED WITHIN SPACES PROVIDED WHERE POSSIBLE. DUCTS SHALL BE INSTALLED TRUE TO LINE AND GRADE. FULLY SECURED TO STRUCTURAL FAMING WITH
 PROPOSED MATERIAL AND EQUIPMENT THAT DIFFER FROM THE SPECIFIED MATERIALS AND EQUIPMENT, AND OF ANY SPECIFIED MATERIALS AND EQUIPMENT WITH SPECIAL CONDITIONS AND/OR ARRANGEMENTS. THESE DRAWINGS SHALL SHOW NECESSARY MODIFICATIONS OF OWNER, PLUMBING, ELECTRICAL, AND MECHANICAL WORK REQUIRED BY THE PROPOSED MATERIALS AND EQUIPMENT. 1.5 COOPERATION WITH OTHER TRADES 	B. THE CONTRACTOR MAY SUBMIT SHOP DRAWINGS AND/OR TECHNICAL INFORMATION ON ALTERNATIVE EQUIPMENT, MATERIALS OR INSTALLATION DETAILS TO ACCOMPLISH THE INTENT OF THE PLANS AND SPECIFICATIONS. APPROVAL OF THE ALTERNATIVE EQUIPMENT, MATERIALS OR INSTALLATION DETAILS SHALL NOT RELIEVE THE CONTRACTOR OF ANY RESPONSIBILITY FOR COMPLYING WITH THE INTENT OF THE PLANS AND SPECIFICATIONS. SUBMIT THE MANUFACTURERS' TECHNICAL INFORMATION, SHOP DRAWINGS, AND/OR WRITTEN DESCRIPTION OF ALTERNATIVE METHODS FOR EACH ITEM DESCRIBED BY MANUFACTURER'S NAME AND	 FACTORY APPLIED FSK ALUMINUM FOIL FACING, WITH A COMPOSITE UL RATING OF 25/50, MINIMUM R-6 INSTALLED. 2. UNLESS SPECIFIED TO BE LINED, ALL SHEET METAL SUPPLY AND RETURN DUCTS IN UNCONDITIONED SPACES SHALL BE INSULATED ON THE OUTSIDE WITH JOHNS MANVILLE "MICROLITE XG" FLEXIBLE FIBERGLASS BLANKET-TYPE DUCT WRAP, WITH FACTORY APPLIED FSK ALUMINUM FOIL FACING, WITH A COMPOSITE UL RATING OF 25/50, MINIMUM R-8 INSTALLED. 3. ALL OUTSIDE AIR DUCTWORK BETWEEN BUILDING OUTSIDE AIR INLET AND HVAC UNIT OR 	 SPECIFIED HANGERS AND SUPPORTS, INSULATED, AND VIBRATION ISOLATED, WHERE REQUIRED B. EACH SECTION OF SUPPLY AIR DUCTWORK SHALL BE CLEANED AT THE SHOP, DUST AND OIL FREE, USING A DEGREASING AGENT AND DETERGENT AND SEALED AIRTIGHT AT BOTH ENDS WITH VISQUEEN AND TAPE. SUPPLY DUCTS SHALL BE ADDITIONALLY CLEANED WITH A DISINFECTING SOLUTION. ENDS OF ALL SUPPLY AND INTERNALLY INSULATED EXHAUST DUSTS SHALL BE KEPT SEALED UNTIL THE TIME THEY ARE JOINTED. WHEN DUCT SECTIONS ARE JOINED WIPE DOWN ALL INTERIOR SURFACES WITH A CLEAN TACK CLOTH. IF TACK CLOTH SHOWS ANY
 A. COOPERATE FULLY WITH OTHER TRADES DOING WORK ON THE PROJECT AS MAY BE NECESSARY FOR THE PROPER COMPLETION OF THE PROJECT. REFER TO THE STRUCTURAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR DETAILS OF THE BUILDING STRUCTURE AND EQUIPMENT INSTALLATION THAT WILL TEND TO OVERLAP, CONFLICT WITH OR REQUIRE COORDINATION WITH THE WORK OF THIS SECTION, AND SCHEDULE THIS WORK ACCORDINGLY. B. ANY WORK DONE WITHOUT REGARD FOR OTHER TRADES SHALL BE MOVED, REPLACED, OR 	 CATALOG NUMBER AND FOR EACH COMPONENT, EQUIPMENT, MATERIAL, OR INSTALLATION DETAIL REQUIRED. 1.17 SITE EXAMINATION A. THOROUGHLY EXAMINE THE SITE AND VERIFY THE ACTUAL WORK CONDITIONS. NO EXTRA COMPENSATION WILL BE ALLOWED FOR EXPENSES DUE TO FAILURE TO DISCOVER SITE 	 HEAT/ENERGY RECOVERY VENTILATOR SHALL BE INSULATED ON THE OUTSIDE WITH JOHNS MANVILLE "MICROLITE XG" FLEXIBLE FIBERGLASS BLANKET-TYPE DUCT WRAP, WITH FACTORY APPLIED FSK ALUMINUM FOIL FACING, WITH A COMPOSITE UL RATING OF 25/50, MINIMUM R-4 INSTALLED. 4. EXHAUST DUCTWORK WITHIN 10 FEET OF TERMINATION POINT AND BETWEEN ANY HEAT/ENERGY RECOVERY VENTILATOR AND EXHAUST TERMINATION SHALL BE INSULATED ON THE OUTSIDE WITH JOHNS MANVILLE "MICROLITE XG" FLEXIBLE FIBERGLASS BLANKET- 	 DUST, THEN RE-CLEAN DUCT AS DESCRIBED ABOVE. THE INTENT IS THAT NO FOREIGN MATTER BE ALLOWED TO ENTER THE DUCTWORK AT ANY TIME AFTER FACTORY CLEANING AND DURING CONSTRUCTION. 3.5 CONTROLS A. THIS CONTRACTOR SHALL PROVIDE ALL REQUIRED CONTROL COMPONENTS. INCLUDING BUT
REDONE AS REQUIRED, WITHOUT EXTRA CHARGES TO OWNER.1.6DIVISION OF WORK BETWEEN DIVISIONS 23 AND 26	CONDITIONS WHICH AFFECT THE WORK. PART 2 – PRODUCTS 2.1 GENERAL	TYPE DUCT WRAP, WITH FACTORY APPLIED FSK ALUMINUM FOIL FACING, WITH A COMPOSITE UL RATING OF 25/50, MINIMUM R-4 INSTALLED. B. INTERIOR OF DUCTWORK:	NOT LIMITED TO THERMOSTATS, TEMPERATURE SENSORS, STATIC PRESSURE SENSORS, HUMIDITY SENSORS, DAMPER ACTUATORS, VALVE ACTUATORS, UNITARY CONTROLLERS, RELAYS, AND LOW-VOLTAGE WIRING, SUCH THAT THE OWNER IS PROVIDED WITH A FULLY FUNCTIONAL CONTROL SYSTEM.
 WORK THAT IS REQUIRED BY THIS CONTRACT. NO ALLOWANCE WILL BE MADE FOR OMISSIONS BASED ON INCORRECTLY ASSUMING ANOTHER TRADE WILL BE PERFORMING YOUR WORK. CONFIRM YOUR SCOPE OF WORK WITH THE GENERAL CONTRACTOR. B. THE DIVISION OF RESPONSIBILITIES BETWEEN TRADES SUPPLYING EQUIPMENT IN OTHER 	A. ALL MATERIALS, APPLIANCES, AND EQUIPMENT SHALL BE NEW AND BEST OF THEIR RESPECTIVE KINDS, FREE FROM DEFECTS, AND OF THE MAKE, BRAND, OR QUALITY SPECIFIED OR AS ACCEPTED BY THE ARCHITECT.	 DUCT LINING SHALL BE INSTALLED IN SUPPLY AND RETURN DUCTS AND PLENUMS WHERE NOTED ON THE DRAWINGS. LINING SHALL BE JOHNS MANVILLE "PERMACOTELINACOUSTIC R" RIGID FIBERGLASS BOARD FOR PLENUMS AND "PERMACOTELINACOUSTIC HP" FIBERGLASS DUCT LINER FOR DUCTS, 1" THICK, UNLESS OTHERWISE NOTED, WITH FIRE RESISTANT COATING. DUCT LINER SHALL MEET ASTM C 1071, WITH AIR SURFACE COATED WITH ACRYLIC 	B. WHERE WORK IS PERFORMED IN AN EXISTING BUILDING, THIS CONTRACTOR SHALL INTEGRATE ALL CONTROL MODIFICATIONS INTO THE EXISTING BUILDING CONTROL SYSTEM, IF APPLICABLE. SPECIFIC REQUIREMENTS SHALL BE COORDINATED WITH OWNER AND APPROVED BY ARCHITEC PRIOR TO INSTALLATION.
 DIVISIONS MAY BE DIFFERENT. FOR INSTANCE, DIVISION 26 CONTRACTOR MAY BE REQUIRED TO SUPPLY DISCONNECT SWITCHES AND STARTERS FOR NON-HVAC MECHANICAL EQUIPMENT SUPPLIED UNDER OTHER DIVISIONS. C. DIVISION 23 RESPONSIBILITIES 1. ASSUME RESPONSIBILITY FOR THE PROPER FUNCTIONING OF THE HVAC SYSTEMS IN THEIR ENTIRETY. 	 B. WHEN TWO OR MORE UNITS OF MATERIALS OR EQUIPMENT OF THE SAME TYPE OR CLASS ARE REQUIRED, THESE UNITS SHALL BE PRODUCTS OF ONE MANUFACTURER. C. APPLY AND INSTALL ALL ITEMS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS. REFER CONFLICTS BETWEEN MANUFACTURER'S INSTRUCTIONS AND THE CONTRACT DRAWINGS AND SPECIFICATIONS TO THE ARCHITECT FOR RESOLUTION. 2.2 THERMOSTATS 	 COATING TREATED WITH EPA REGISTERED ANTI-MICROBIAL AGENT PROVE TO RESIST MICROBIAL GROWTH AS DETERMINED BY ASTM G 21 AND G 22. INSULATION WITH TORN OR BROKEN COATING SHALL BE REMOVED AND REPLACED. LOOSE CORNERS, EDGES, AND BUTT JOINTS WILL NOT BE ACCEPTED. 2. ALL EXPOSED EXTERIOR SUPPLY AND RETURN DUCTWORK SHALL HAVE MINIMUM 2" INTERIOR INSULATION, AS SPECIFIED IN THIS SECTION. 3. MAXIMUM VELOCITY: 5,000 FT/MIN. 4. FASTENERS: DUCT LINER GALVANIZED STEEL PINS, WELDED OR MECHANICALLY FASTENED. 	 C. INSTALLATION OF THE SYSTEM SHALL BE MADE UNDER THE SUPERVISION OF THE MANUFACTURER OF THE EQUIPMENT, OR HIS FACTORY AUTHORIZED REPRESENTATIVE. D. ROOM THERMOSTATS SHALL BE INSTALLED IN THE LOCATIONS INDICATED ON THE CONTRACT DRAWINGS. FINAL LOCATIONS SHALL BE COORDINATED WITH OWNER'S MAINTENANCE PERSONNEL AND SHALL BE INSTALLED IN LOCATIONS WHICH SHALL PROVIDE REPRESENTATIVE TEMPERATURES FOR THE ADJACENT AREAS.
 FURNISH AND INSTALL ALL CONDUCTORS AND CONDUIT REQUIRED FOR CONTROL OF HVAC EQUIPMENT. MAKE ALL TERMINATIONS WITH THE EXCEPTION OF POWER CONDUCTORS. FURNISH AND INSTALL ALL CONTROL PANELS AND DEVICES TO PROVIDE A COMPLETE AND FUNCTIONAL CONTROLS SYSTEM, INCLUDING ALL CONTROLS TRANSFORMERS. 	 A. ELECTRIC, SOLID-STATE, MICROCOMPUTER-BASED ROOM THERMOSTAT WITH THE FOLLOWING FEATURES. 1. AUTOMATIC SWITCHING FROM HEATING TO COOLING. 	 DEVELOPED SMOKE DENSITY SHALL NOT EXCEED 50. FLAME SPREAD RATING SHALL NOT EXCEED 25. REFRIGERATION PIPING AND APPURTENANCES : 	 E. LOW VOLTAGE CONTROL WIRING AND CONDUIT SHALL BE INSTALLED IN ACCORDANCE WITH REQUIREMENTS OF DIVISION 26. 3.6 INSULATION
 FURNISH AND INSTALL MOTOR STARTERS FOR ALL EQUIPMENT SPECIFIED IN DIVISION 23. INSTALL DUCT SMOKE DETECTORS FURNISHED BY FIRE ALARM CONTRACTOR IN BUILDINGS WITH FIRE ALARM SYSTEMS. FURNISH AND INSTALL DUCT SMOKE DETECTORS IN BUILDINGS WITHOUT FIRE ALARM SYSTEMS. FURNISH AND INSTALL ALL CONTROL CONDUCTORS AND CONDUIT CONNECTING DUCT 	 PREFERENTIAL RATE CONTROL TO MINIMIZE OVERSHOOT AND DEVIATION FROM SET POINT. SET UP FOR FOUR SEPARATE TEMPERATURES PER DAY. INSTANT OVERRIDE OF SET POINT FOR CONTINUOUS OR TIMED PERIOD FROM 1 HOUR TO 31 DAYS. SHORT-CYCLE PROTECTION. PROGRAMMING BASED ON EVERY DAY OF WEEK. 	 A. REFRIGERANT PIPING SHALL BE TYPE "ACR" DE-OXIDIZED HARD TEMPER COPPER TUBE, ASTM B280. B. MECHANICAL JOINTS ON REFRIGERANT PIPING SYSTEMS ARE PROHIBITED. ALL REFRIGERANT PIPING JOINTS SHALL BE BRAZED. USE LEAD-FREE, SILVER SOLDER, MINIMUM 15% SILVER CONTENT. 	 A. EXTERIOR DUCTWORK: 1. THE INSULATION SHALL BE CUT LONGER THAN THE PERIMETER OF THE DUCT TO PROVIDE 2" STAPLE LAP AND MINIMUM COMPRESSION AT THE CORNERS. ALL JOINTS SHALL BE LAPPED 2 AND STAPLED WITH OUTWARD CLINCHING STAPLES 2" ON CENTER. THE INSULATION SHALL BE MECHANICALLY FASTENED TO THE UNDERSIDE OF ALL DUCTS 24" WIDE OR MORE USING
 SMOKE DETECTORS TO SMOKE DAMPERS AND FAN START CONTROLS. 9. ALL ELECTRICAL WORK PERFORMED UNDER DIVISION 23 SHALL CONFORM TO THE REQUIREMENTS OF DIVISION 26. D. DIVISION 26 RESPONSIBILITIES 1. FURNISH AND INSTALL ALL RACEWAYS, CONDUIT, DISCONNECT SWITCHES, AND CONDUCTORS AND FOR FURNISH POWER OF DIVISION FOR SUPPLY 	 SELECTION FEATURES INCLUDE DEGREE F OR DEGREE C DISPLAY, 12- OR 24-HOUR CLOCK, KEYBOARD DISABLE, REMOTE SENSOR, AND FAN ON-AUTO. BATTERY REPLACEMENT WITHOUT PROGRAM LOSS. THERMOSTAT DISPLAY FEATURES INCLUDE THE FOLLOWING: a. TIME OF DAY. b. ACTUAL ROOM TEMPERATURE. DECORDAMMED TEMPERATURE. 	 C. PIPE FITTINGS SHALL BE WROUGHT-COPPER WITH SOLDERED JOINTS, ASME B16.22. D. FLEXIBLE CONNECTIONS SHALL BE BRONZE, DOUBLE BRAIDED, SWEAT SOLDER ENDS. E. MOISTURE/LIQUID INDICATORS (SIGHT GLASSES) SHALL BE COLOR CHANGE MOISTURE INDICATION TYPE, REPLACEABLE ELEMENT, FILTER SCREEN AND PAD, SWEAT SOLDER ENDS; ODDI AN KOFF AND YOR FOLLAR. 	 CUP-HEAD PINS, WELD PINS, OR STICK PINS WITH SPEED CLIPS 18" ON CENTER. ALL JOINTS AND PENETRATIONS OF THE VAPOR BARRIER JACKET SHALL BE SEALED WITH A MINIMUM 3" WIDE MATCHING PRESSURE SENSITIVE TAPE. PRESSURE-SENSITIVE TAPE SHALL BE FIRMLY RUBBED IN PLACE IMMEDIATELY AFTER APPLICATION USING A "SQUEEGEE" TYPE TOOL. 2. WHEN A VAPOR SEAL IS REQUIRED, TWO COATS OF VAPOR RETARDER MASTIC REINFORCED WITH ONE LAYER OF 4" WIDE, OPEN WEAVE GLASS FABRIC MAY BE USED IN LIEU OF PRESSURE-SENSITIVE TAPE. MASTIC SHALL BE BRUSHED ONTO JOINT AND GLASS FABRIC UNTIL THE FAPILIE OF HERE MASTIC SHALL DE ADDUED IN LIEU OF DINTER AND THE FAPILIES IN A START OF THE FAPILIES OF TAPE. MASTIC SHALL DE ADDUED IN LIEU OF DINTENDED IN LOOD DINTENDED IN LIEU OF DINTENDED IN LOOD DINTENDED IN LOOD DINTENDED IN LIEU OF DINTENDED IN LOOD DINTENDED IN LIEU OF DINTENDED IN LOOD DINTENDED IN LIEU OF DINTENDED IN LOOD DINTENDED IN LOOD
 CONDUCTORS NECESSARY FOR ELECTRICAL POWER SUPPLY. 2. MAKE ALL POWER SUPPLY TERMINATIONS TO MOTORS, STARTERS, DISCONNECT SWITCHES, CONTROL TRANSFORMERS, AND OTHER MECHANICAL DEVICES. 3. FIRE ALARM CONTRACTOR TO FURNISH DUCT SMOKE DETECTORS IN BUILDINGS WITH FIRE ALARM SYSTEMS. 4. PROVIDE POWER TO ALL DUCT SMOKE DETECTORS AND SMOKE DAMPERS. 5. COORDINATE ALL WORK WITH MECHANICAL CONTRACTORS. 	 c. PROGRAMMED TEMPERATURE. d. PROGRAMMED TIME. e. DURATION OF TIMED OVERRIDE. f. DAY OF WEEK. g. SYSTEM MODE INDICATIONS INCLUDE "HEATING," "OFF," "FAN AUTO," AND "FAN ON." B. THERMOSTAT COVER CONSTRUCTION: HEAVY-DUTY, LOCKING THERMOSTAT GUARD, OF SOLID 	 SPORLAN "SEE-ALL", HENRY, OR EQUAL. F. CHARGING AND PURGE VALVES SHALL BE FORGED BRASS, DIAPHRAGM PACKLESS, GLOBE TYPE, ANGLE OR STRAIGHT THROUGH, ONE END SOLDER, ONE END FLARE; HENRY 623 AND 643 SERIES, SPORLAN OR EQUAL. G. SOLENOID VALVES SHALL BE FORGED BRASS, EXTENDED END CONNECTIONS, SOLDER ENDS. 	 UNTIL THE FABRIC IS FILLED. MASTICS SHALL BE APPLIED IN ACCORDANCE WITH APPLICATION INSTRUCTIONS ON THE CONTAINER. B. INTERIOR DUCT LINER 1. APPLY TO THE INSIDE FACE OF DUCTS, COATED SIDE FACING AIR STREAM, FASTEN USING FIRE RETARDANT ADHESIVE MEETING ASTM C 9169. AND SECURE WITH MECHANICAL LINER
 1.7 AS-BUILT DRAWINGS A. A COMPLETE SET OF CONTRACT DRAWINGS SHALL BE MAINTAINED AT THE WORK SITE, AND ALL CHANGES IN THE WORK SHALL BE RECORDED ON THIS SET, ON A DAILY BASIS. THE FINAL AS- BUILT DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT FOR APPROVAL. 	 METAL TAMPERPROOF CONSTRUCTION. C. ACCURACY: PLUS OR MINUS 0.5 DEG. F AT CALIBRATION POINT. D. WIRE: TWISTED, SHIELDED-PAIR CABLE. 	 MOLDED COIL; SPORLAN "E" SERIES OR EQUAL. COMPLY WITH ARI 760 & UL 429. H. FILTER DRIERS SHALL BE REPLACEABLE MEDIA, ANGLE TYPE; HENRY "DRI-COR" OR EQUAL; ARI 730. 	 FASTENERS AT 24" MAXIMUM O.C., BOTH DIRECTIONS. PIN LENGTH SHOULD BE SUCH AS TO LIMIT COMPRESSION OF LINER. 2. EXPOSED EDGES MUST BE FACTORY OR FIELD COATED. FOR SYSTEMS OPERATING AT 4000 FPM OR HIGHER, A METAL NOSING MUST BE INSTALLED ON ALL LINER LEADING EDGES. INSULATION WITH TORN OR BROKEN COATINGS SHALL BE REMOVED OR REPLACED. LOOSE
 1.8 DESIGN DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT FOR APPROVAL. 1.8 DESIGN DRAWINGS A. THE DRAWINGS INDICATE DIAGRAMMATICALLY THE GENERAL LAYOUT OF THE MECHANICAL SYSTEMS AND OTHER RELATED WORK. FIELD VERIFICATION OF SCALED DIMENSIONS TAKEN 	 E. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS PRIOR TO ORDERING FAN AND CURB ADAPTOR. 2.3 DUCTWORK A. SHEET METAL DUCTWORK - RECTANGULAR 	 THERMSOTATIC EXPANSION VALVES SHALL HAVE FORGED BRASS BODY, STAINLESS STEEL SEATS AND PINS, ODF SOLDER CONNECTIONS, EXTERNAL EQUALIZER,; ARI 750. OUTDOOR CONDENSING UNITS SHALL HAVE A FLEXIBLE PIPING SECTION AT THE OUTDOOR UNIT. K. REFRIGERANT PIPING BETWEEN THE OUTDOOR UNIT AND THE INDIVIDUAL FAN COIL (SPLIT 	CORNERS, EDGES, AND BUTT JOINTS WILL NOT BE ACCEPTED. C. REFRIGERANT PIPING 1. THE INSULATION SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS, ALL JOINTS AND SEAMS SHALL BE SEALED WITH WATERPROOF VAPOR
 FROM THE DRAWINGS IS REQUIRED. B. THE CONTRACTOR SHALL REVIEW AND COMPARE THE ARCHITECTURAL, STRUCTURAL, PLUMBING, MECHANICAL, AND ELECTRICAL DRAWINGS AND ALL OWNER SUPPLIED EQUIPMENT DRAWINGS, AND ADJUST THEIR WORK TO BE IN CONFORMITY WITH THE CONDITIONS INDICATED 	 DUCTS AND PLENUMS SHALL BE FABRICATED AND INSTALLED IN CONFORMANCE WITH THE LATEST EDITIONS OF: NFPA PAMPHLET NO. 90A; CALIFORNIA BUILDING CODE; CALIFORNIA MECHANICAL CODE AND THE SMACNA HVAC DUCT CONSTRUCTION STANDARDS (METAL AND FLEXIBLE). DUCTS AND PLENUMS SHALL BE CONSTRUCTED OF HOT DIPPED GALVANIZED 	SYSTEM) OR BRANCH SELECTOR BOX (VRF SYSTEM) SHALL BE TYPE "ACR" DE-OXIDIŻED HARD TEMPER COPPER TUBE, ASTM B280. L. REFRIGERANT PIPING (EXPOSED) BETWEEN THE INDOOR BRANCH SELECTOR BOXES AND THE INDIVIDUAL FAN COIL IN EXPOSED AREAS SHALL BE TYPE "ACR" DE-OXIDIZED HARD TEMPER	RETARDANT ADHESIVE. ALL PIPES EXPOSED TO THE WEATHER SHALL BE COATED WITH ALUMINUM JACKETING TO PROTECT THE INSULATION FROM ULTRA-VIOLET RADIATION IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTRUCTIONS. 3.7 TEST, INSPECTIONS
THEREON. DISCREPANCIES BETWEEN DRAWINGS, BETWEEN DRAWINGS AND ACTUAL FIELD CONDITIONS, OR BETWEEN DRAWINGS AND SPECIFICATIONS, SHALL PROMPTLY BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR A DETERMINATION OF THE MODIFICATIONS TO BE EFFECTED. IN THE EVENT THAT A MAJOR MODIFICATION IS REQUIRED, A CHANGE ORDER WILL BE PREPARED.	 MILD STEEL AND SHALL HAVE AIRTIGHT CLASS "B" SEALS AT ALL TRANSVERSE JOINTS AND LONGITUDINAL SEAMS. TABLES AND FIGURES HEREINAFTER REFERENCED ARE FROM THE 2005 EDITION OF THE SMACNA HVAC DUCT CONSTRUCTION STANDARDS (METAL AND FLEXIBLE). 2. RECTANGULAR DUCT CONSTRUCTION SHALL CONFORM TO TABLE 2-3. ALL TRANSVERSE JOINTS SHALL BE FLANGED PER TABLE 2-32. WITH CORNER CLOSURES OR "DUCT MATE" 	 COPPER TUBE, ASTM B280. M. REFRIGERANT PIPING SHALL BE INSULATED WITH 1" WALL THICKNESS "ARMACELL AP ARMAFLEX" BLACK FLEXIBLE CLOSED-CELL ELASTOMERIC THERMAL INSULATION IN TUBULAR FORM WITH SELF-SEAL SYSTEM REINFORCED WITH LAP SEAL TAPE. 	A. MAKE ALL NECESSARY CONTROL ADJUSTMENTS AND BALANCING OF AIR FLOWS. OPERATE THE ENTIRE SYSTEM FOR A PERIOD OF TIME NOT LESS THAN THREE (3) WORKING DAYS FOR THE PURPOSE OF PROVING SATISFACTORY PERFORMANCE. DURING THIS PERIOD, INSTRUCT SUCH PERSONS AS THE OWNER AND/OR ARCHITECT MAY DESIGNATE IN THE PROPER OPERATION OF THE SYSTEMS. SHOULD FURTHER ADJUSTMENT PROVE NECESSARY, OPERATING TESTS SHALL
 1.9 VERIFICATION OF EXISTING CONDITIONS AND DEMOLITION A. BEFORE INSTALLATION OF ANY NEW WORK, VERIFY THE LOCATION, SIZE, AND OTHER CONDITIONS AT ALL POINTS OF CONNECTION TO SERVICES OR OTHER EXISTING PIPING, AND AT ALL LOCATIONS WHERE NEW WORK WILL CROSS OR PASS NEAR EXISTING PIPING, ELECTRICAL, OR OTHER FACILITIES. 	 FLANGED CONNECTIONS WITH CORNER CLOSURES PER FIGURE 2-17. ELBOWS SHALL BE STANDARD RADIUS (TYPE RE 1) OR SQUARE THROAT WITH VANES (TYPE RE 2) PER FIGURE 4-2, WITH DOUBLE THICKNESS TURNING VANES PER FIGURES 4-3 AND 4-4. OFFSETS AND TRANSITIONS SHALL BE PER FIGURE 4-7. SUPPLY, RETURN, AND EXHAUST BRANCH CONNECTIONS SHALL BE PER FIGURE 4-5 OR 4-6. SPLITTERS SHALL NOT BE USED. LINED DUCTS SHALL BE FABRICATED SUCH THAT THE NET INSIDE DIMENSIONS EQUALS THE DUCT SIZES SHOWN ON THE DRAWINGS. 	 N. REFRIGERANT PIPING (CONCEALED) BETWEEN THE INDOOR BRANCH SELECTOR BOXES AND THE INDIVIDUAL AIR HANDLING UNITS MAY BE PRE-INSULATED LINE SETS, ISOCLIMA OR EQUAL. PRE- INSULATED WITH EXPANDED POLYETHYLENE SHEATH, CLOSED CELL WITH EXTERNAL LDPE FOIL. PIPING SHALL BE CRIMPED CLOSED FOR SAFETY. TESTED IN ACCORDANCE WITH UL94 FOR SURFACE BURNING CHARACTERISTICS, UL723A FOR FLAME/SMOKE INDEX AND UL746A FOR IGNITION RESISTANCE. COPPER SHALL BE ASTM B280 APPROVED. 	 BE REPEATED UNTIL A SATISFACTORY TEST IS OBTAINED. B. THIS CONTRACTOR SHALL NOT ALLOW OR CAUSE ANY WORK OF THIS SECTION TO BE COVERED OR ENCLOSED UNTIL IT HAS BEEN INSPECTED, TESTED, AND APPROVED BY THE ARCHITECT AND THE AUTHORITIES HAVING JURISDICTION OVER THE WORK. SHOULD ANY OF THIS WORK BE ENCLOSED OR COVERED UP BEFORE SUCH INSPECTION, TESTING, AND APPROVAL, THIS CONTRACTOR SHALL UNCOVER THE WORK, HAVE THE NECESSARY INSPECTIONS, TESTS, AND
 B. REMOVE DUCTWORK, PIPING, CONTROLS, FIXTURES, AND EQUIPMENT THAT IS NOT TO REMAIN IN SERVICE AS SHOWN ON THE DRAWINGS OR AS REQUIRED. THIS INCLUDED THE REMOVAL OF ASSOCIATED APPURTENANCES AND SUPPORTS. C. PATCH, CAP, OR REPAIR EXISTING WORKS AFFECTED BY THIS DEMOLITION IN CONCEALED SPACES WITHIN SIX (6) INCHES OF A LIVE MAIN OR BRANCH. 	B. SHEET METAL DUCTWORK – ROUND DUCTS SHALL BE SPIRAL, UNITED MCGILL OR EQUAL. ALL TRANSVERSE JOINTS AND LONGITUDINAL SEAMS SHALL HAVE CLASS "B" SEALS. ALL BRANCHES IN ROUND DUCT SYSTEMS SHALL BE MADE WITH FACTORY FABRICATED REDUCING WYE BRANCHES. DUCT TURNS SHALL BE MADE WITH STANDARD, FACTORY FABRICATED, THREE-		APPROVALS MADE AND, AT NO EXPENSE TO THE OWNER, MAKE ALL REPAIRS NECESSARY TO RESTORE BOTH HIS WORK AND THAT OF OTHER CONTRACTORS WHICH MAY HAVE BEEN DAMAGED TO BE IN CONFORMITY WITH THE CONTRACT DOCUMENTS. 3.8 CLEANUP
 SPACES WITHIN SIX (6) INCHES OF A LIVE MAIN OR BRANCH. D. DELIVER REMOVED MATERIAL TO THE OWNER AS DIRECTED BY THE ARCHITECT. DISPOSE OF ALL OTHER REMOVED MATERIAL OFFSITE. E. INFORMATION SHOWN RELATIVE TO EXISTING SERVICES IS BASED UPON AVAILABLE RECORDS 	PIECE ELBOWS. C. FLEXIBLE DUCTWORK – FLEXIBLE DUCTS SHALL BE FLEXMASTER "8M" OR APPROVED EQUAL. FLEXIBLE DUCTS SHALL BE USED ONLY WHERE SHOWN ON THE DRAWINGS, AND MAXIMUM LENGTH OF ANY GIVEN FLEXIBLE DUCT SHALL NOT EXCEED 5 FT. GALVANIZED SHEET METAL ELBOWS SHALL BE USED FOR TURNS GREATER THE 45° ON FLEXIBLE DUCTS 10" AND LARGER.	INSTALLATION. B. FIRE RATED: INRYCO/MILCOR, U.L. LISTED, "B" LABEL, 1 ½ HOUR RATING. MINIMUM SIZE SHALL BE 12" X 12". PROVIDE LARGER SIZES WHERE REQUIRED. LOCKS SHALL BE FLUSH SCREWDRIVER OPERATED.	A. UPON COMPLETION OF THE WORK OF THIS SECTION, REMOVE ALL MATERIAL, DEBRIS, AND EQUIPMENT ASSOCIATED WITH OR USED IN THE PERFORMANCE OF THIS WORK. END OF SECTION
E. INFORMATION SHOWN RELATIVE TO EXISTING SERVICES IS BASED UPON AVAILABLE RECORDS AND DATA DURING PREPARATION OF THE DRAWINGS, BUT SHALL BE VERIFIED. MAKE REASONABLE DEVIATIONS FOUND NECESSARY TO CONFORM TO ACTUAL LOCATIONS AND CONDITIONS, WITHOUT EXTRA CHARGE.	CONNECTIONS TO RECTANGULAR DUCTS SHALL BE MADE WITH "SPIN-IN" FITTINGS WITH AIR SCOOPS. THE INSTALLATION OF FLEXIBLE DUCTS SHALL CONFORM TO FIGURE 3-10, WITH THE EXCEPTIONS NOTED HEREIN.	C. DRYWALLED SURFACES: INRYCO/MILCOR, STYLE DW, PRIME COATED STEEL. MINIMUM SIZE SHALL BE 12" X 12". PROVIDE LARGER SIZES WHERE REQUIRED. LOCKS SHALL BE FLUSH SCREWDRIVER OPERATED.	

+---



		GENERAL DPE
1.1	A.	PROVIDE ALL SUPEI OTHER MATERIALS DATA INCLUDING C/ AND AIR CONDITION DRAWINGS AND SPI
1.2	GEI	NERAL
	A.	MECHANICAL CONT AGENCY THAT IS CE ENVIRONMENTAL B BUREAU (TABB).
	B.	THE TAB AGENCY M ACCEPTANCE TEST REQUIRED ACCEPT
	C.	AND LOGGING THE ALL AIR DISTRIBUTION
	D. E.	EXISTING EQUIPMEN SCOPE OF THE TAB A COMPLETELY OPE TESTING AND BALA
	F.	THE TAB AGENCY S ASHRAE 111, SECTIO
	G.	THE MECHANICAL C SYSTEM, AS SCHED SHALL INCLUDE NO CERTIFICATION THA FULL LOAD PERFOR MECHANICAL CONT REPORT SHALL BE
	H.	THE MECHANICAL C RECERTIFY DISCRE COMPLIANCE WITH MECHANICAL CONT SO THAT BALANCIN
	I.	IF CONSTRUCTION I CONDITIONS, THE D REPRESENTATIVE. CONSTRUCTION AR INCLUDE IN THE BID THE DEFICIENCIES.
1.3	SEF	RVICES THE TAB AGENCY W
	Α.	OPTIMUM CONDITIC DEFICIENCIES ARE DEFICIENCIES WILL AGENCY IS ADVISED ENCOUNTERED DUI
	B.	DEEMED ADVISABLE THE REPORT SHALL ALL LOGS, DATA, AN BOUND. TRANSMIT DISTRIBUTED TO TH
	C.	THE REPORT SHALL
		1. PROJECT TITLE
		 PROJECT LOCA PROJECT ARCH PROJECT MECH TAB FIELD TEST TAB AGENCY (FI
		 INCLUSIVE DATE CALIBRATION CI NUMBERS (I.E., 5)
1.4	SU	BMITTALS
	A.	SUBMITTAL NO. 159 1. THE TAB CONTR
		THE TESTING M WITHIN THE SCO BALANCE REPO BE REPRESENT 2. THE TAB AGENE
	B.	DEVICES AND A SUBMITTAL NO 1595
1.5	AIR	1. PROVIDE TEST / SYSTEMS REQUIRE
	A.	IN ADDITION TO THE REPORT SHALL INC
		 HEATED VENTIL a. MANUFACTU b. SIZE.
		c. MOTOR HP, d. LOCATION A e. IDENTIFICAT f. SUPPLY AIR
		g. FAN RPM. h. MOTOR CUF i. INLET AND C
		APPLICABLE j. STATIC PRE k. ENTERING A I. OUTDOOR A
		m. OUTDOOR A n. OUTDOOR A
		 DUCTED FAN CO a. MANUFACTU b. SIZE.
		c. MOTOR HP, d. LOCATION A e. IDENTIFICAT f. SUPPLY AIR
		g. FAN RPM. h. MOTOR CUF i. INLET AND C
		INTERINGS S j. STATIC PRE k. ENTERING A I. ENTERING A
		m. OUTDOOR A n. OUTDOOR A o. OUTDOOR A
PA	RT 2	– PRODUCTS (NOT
		- EXECUTION
0.1	А.	DURING THE BALAN RELATIONSHIP BET
		OF THE FINAL SETT SUCCESSIVE 8-HOU AFTER TENANT MOV PRESET MEDIUM TE
3.2	AIR	DONE ONLY ON SYS
	A.	THE TAB AGENCY S ACCORDANCE WITH
		 TEST AND ADJU TEST AND RECO MAKE PITOT TUI TEST AND RECO
		 TEST AND ADJU TEST AND RECO AND COOLING CO
		 TEST AND RECO COILS. ADJUST ALL MA SUPPLY AIRFLO
		BALANCED TO V 9. ADJUST ALL ZOI 10. TEST AND ADJU
		REQUIREMENT. 11. EACH GRILLE, D

TAB SPECIFICATION

UPERVISION, PERSONNEL, INSTRUMENTS, CALIBRATION, EQUIPMENT, AND ALL ALS NECESSARY TO PERFORM BALANCING AND TESTING, AND COMPILE TEST NG CALCULATIONS AND SERVICES NECESSARY FOR THE HEATING, VENTILATING, TIONING SYSTEMS FOR THIS PROJECT, ALL IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND AS SPECIFIED HEREIN.

ONTRACTOR WILL EMPLOY A TESTING, ADJUSTING, AND BALANCING (TAB) IS CERTIFIED BY ASSOCIATED AIR BALANCING COUNCIL (AABC), NATIONAL TAL BALANCING BUREAU (NEBB), OR TESTING, ADJUSTING, AND BALANCING

NCY MUST ALSO BE AN APPROVED ACCEPTANCE TEST EMPLOYER WITH TEST TECHNICIANS (ATT). THE ATT WILL BE RESPONSIBLE FOR PERFORMING ALL CEPTANCE TESTING AND ASSOCIATED FORMS.

- CY SHALL BE RESPONSIBLE FOR INSPECTING, BALANCING, ADJUSTING, TESTING, THE DATA OF THE PERFORMANCE OF FANS, ALL DAMPERS IN THE DUCT SYSTEMS, BUTION DEVICES, AND THE FLOWS OF WATER THROUGH ALL COILS.
- PMENT, UNLESS SPECIFICALLY MENTIONED OTHERWISE, SHALL NOT IN THE TAB WORK. OPERABLE SYSTEM SHALL BE PLACED INTO OPERATION EACH DAY DURING
- BALANCING.
- ICY SHALL UTILIZE INSTRUMENTATION WHICH MEETS THE REQUIREMENTS OF ECTION 5, "INSTRUMENTATION".
- CAL CONTRACTOR SHALL BE RESPONSIBLE FOR CERTIFYING IN WRITING THAT THE HEDULED FOR BALANCING, IS OPERATIONAL AND COMPLETE. COMPLETENESS NOT ONLY THE PHYSICAL INSTALLATION. BUT THE MECHANICAL CONTRACTOR'S I THAT THE PRIME MOVERS ARE INSTALLED IN GOOD WORKING ORDER, AND THAT RFORMANCE HAS BEEN PRELIMINARY TESTED UNDER THE CERTIFICATION OF THE ONTRACTOR. BEFORE ANY TESTING AND BALANCING IS STARTED, A COMPLETE BE SENT TO THE TAB AGENCY BY THE MECHANICAL CONTRACTOR.
- AL CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ALL MODIFICATIONS TO CREPANCIES REPORTED BY THE TAB CONTRACTOR AS INDICATING NON-VITH THE CONTRACT DOCUMENTS. BY COMPLETING THE WORK ON TIME, THE ONTRACTOR SHALL PROVIDE SUFFICIENT TIME BEFORE THE COMPLETION DATE
- NCING CAN BE ACCOMPLISHED. ION DEFICIENCIES ARE ENCOUNTERED WHICH PRECLUDE OBTAINING OPTIMUM HE DEFICIENCIES WILL BE RECORDED AND GIVEN TO THE OWNER'S IVE. THE TAB AGENCY IS ADVISED THAT DEFICIENCIES IN THE HVAC N ARE OFTEN ENCOUNTERED DURING FINAL TAB SERVICES, AND SHOULD E BID AN AMOUNT DEEMED ADVISABLE TO COMPENSATE FOR TIME IN IDENTIFYING
- NCY WILL BALANCE, TEST, AND ADJUST THE SYSTEMIC COMPONENTS TO OBTAIN DITIONS IN EACH CONDITIONED SPACE IN THE BUILDING. IF CONSTRUCTION ARE ENCOUNTERED WHICH PRECLUDE OBTAINING OPTIMUM CONDITIONS, THE WILL BE RECORDED AND GIVEN TO THE OWNER'S REPRESENTATIVE. THE TAB
- /ISED THAT DEFICIENCIES IN THE HVAC CONSTRUCTION ARE OFTEN DURING FINAL TAB SERVICES, AND SHOULD INCLUDE IN THE BID AN AMOUNT ABLE TO COMPENSATE FOR TIME IN IDENTIFYING THE DEFICIENCIES. HALL BE COMPLETE WITH LOGS, DATA, AND RECORDS AS REQUIRED HEREIN AND 3.5 TEST AND BALANCE REPORT A. AND RECORDS SHALL BE TYPED, PRODUCED, ON WHITE BOND PAPER, AND
- MIT FOUR COPIES DIRECTLY TO THE OWNER'S REPRESENTATIVE TO BE TO THE MECHANICAL CONTRACTOR, CONTROLS CONTRACTOR, ENGINEER, AND HALL CONTAIN THE FOLLOWING GENERAL DATA IN A FORMAT SELECTED BY THE
- OR CLARITY AND EASE OF REFERENCE. TTLE. OCATION.
- ARCHITECT (FIRM NAME AND ADDRESS). AECHANICAL ENGINEER (NAME).
- TEST ENGINEER (NAME). CY (FIRM NAME AND ADDRESS).
- DATES TESTS WERE PERFORMED AND DATE OF REPORT. ON CERTIFICATES OF EACH INSTRUMENT USED ALONG WITH SPECIFIC ID I.E., SERIAL NUMBERS).
- 15950 (1) TAB AGENDA
- ONTRACTOR SHALL SUBMIT A COMPLETE AGENDA, WHICH SHALL OUTLINE IN FULL IG METHODS AND LOCATIONS FOR EACH HVAC SYSTEM AND/OR DEVICE THAT IS SCOPE OF THE TAB WORK. THE AGENDA SHALL REPRESENT THE TOTAL SYSTEM EPORT, LESS FIELD TEST DATA. AREAS OF INTENDED FIELD TEST INPUTS SHALL ENTED BY FULLY LABELED BLANK SPACES. SENDA SHALL ALSO INDICATE THE PROPOSED TEST METHODS, INSTRUMENTATION ND ALL APPLICABLE CALIBRATION CERTIFICATES.
- 15950 (2) TAB REPORT EST AND BALANCE REPORT AS INDICATED HEREIN.
- JIREMENTS
- THE ABOVE DATA IN ITS APPROPRIATE FORMAT, THE TEST AND BALANCE INCLUDE THE FOLLOWING DATA:
- NTILATORS (EXISTING AND NEW)
- ACTURER AND MODEL. R HP, VOLTAGE, PHASE, CYCLES, FULL LOAD AMPS.
- ION AND LOCAL IDENTIFICATION DATA. ICATION TAG LISTED IN SCHEDULES ON DRAWINGS AND SPECIFICATIONS. AIRFLOW (CFM) AND RETURN AIRFLOW (CFM), WHERE APPLICABLE.
- CURRENT READINGS AT EACH FAN. ND OUTLET STATIC PRESSURE FROM SUPPLY FAN AND RETURN FAN (IF ABLE). THESE READINGS SHALL BE RELATED TO THE FAN CURVE. PRESSURE DIFFERENTIAL ACROSS EACH FILTER SECTION. ING AIR AND LEAVING AIR TEMPERATURES (DB) IN 100% HEATING MODE.
- OR AIR PERCENTAGE SETTING. OR AIRFLOW IN ECONOMIZER MODE (IF APPLICABLE). DOR AIRFLOW IN DEMAND CONTROL VENTILATION MODE (IF APPLICABLE).
- N COILS ACTURER AND MODEL.
- R HP. VOLTAGE, PHASE, CYCLES, FULL LOAD AMPS.
- ION AND LOCAL IDENTIFICATION DATA. FICATION TAG LISTED IN SCHEDULES ON DRAWINGS AND SPECIFICATIONS. AIRFLOW (CFM) AND EXHAUST AIRFLOW (CFM), WHERE APPLICABLE.
- CURRENT READINGS AT EACH FAN. ND OUTLET STATIC PRESSURE FROM SUPPLY FAN (IF APPLICABLE). THESE IGS SHALL BE RELATED TO THE FAN CURVE. PRESSURE DIFFERENTIAL ACROSS EACH COIL AND FILTER SECTION. NG AIR AND LEAVING AIR TEMPERATURES (DB/WB) IN 100% COOLING MODE.
- NG AIR AND LEAVING AIR TEMPERATURES (DB) IN 100% HEATING MODE. OR AIR PERCENTAGE SETTING. OR AIRFLOW IN ECONOMIZER MODE (IF APPLICABLE).
- OR AIRFLOW IN DEMAND CONTROL VENTILATION MODE (IF APPLICABLE).
- NOT USED)
- URES
- ALANCING, THE TEMPERATURE REGULATION SHALL BE ADJUSTED FOR PROPER BETWEEN CONTROLLING INSTRUMENTS AND CALIBRATED. THE CORRECTNESS SETTING SHALL BE PROVED BY TAKING HOURLY READINGS FOR A PERIOD OF ONE HOUR DAY, IN A TYPICAL ROOM ON EACH SEPARATELY CONTROLLED ZONE. MOVES IN. THE TOTAL VARIATION SHALL NOT EXCEED 2 DEGREES FROM THE M TEMPERATURE DURING THE TEMPERATURE SURVEY PERIOD. (THIS WILL BE I SYSTEMS THAT ARE TOTALLY OPERATIONAL). CEDURES
- CY SHALL PERFORM THE FOLLOWING TESTS AND BALANCE THE AIR SYSTEMS IN WITH THE FOLLOWING REQUIREMENTS:
- ADJUST BLOWER AND MOTOR RPM TO DESIGN REQUIREMENTS. RECORD MOTOR FULL LOAD AMPERES AND CORRESPONDING VOLTAGE. TUBE TRAVERSE OF MAIN SUPPLY DUCTS AND OBTAIN DESIGN CFM AT FANS. RECORD SYSTEM STATIC PRESSURES. SUCTION AND DISCHARGE. ADJUST SYSTEM FOR DESIGN CFM OF OUTSIDE AIR. RECORD ENTERING AND LEAVING AIR DRY BULB TEMPERATURES OF ALL HEATING
- ING COILS. RECORD ENTERING AND LEAVING WET BULB TEMPERATURES OF ALL COOLING MAIN SUPPLY AND RETURN AIR DUCTS TO PROPER DESIGN CFM. SYSTEM
- RFLOW, SYSTEM RETURN AIRFLOW, AND SYSTEM OUTDOOR AIRFLOW SHALL BE TO WITHIN 5% OF THE DESIGN REQUIREMENT. L ZONES TO PROPER DESIGN CFM, SUPPLY AND RETURN. ADJUST EACH DIFFUSER, GRILLE, AND REGISTER TO WITHIN 10% OF DESIGN
- LLE, DIFFUSER, AND REGISTER SHALL BE IDENTIFIED AS TO LOCATION AND AREA.

- 12. SIZE, TYPE, AND MANUFACTURER OF DIFFUSERS, GRILLES, REGISTERS, AND ALL TESTED EQUIPMENT SHALL BE IDENTIFIED AND LISTED. MANUFACTURER'S RATINGS ON ALL EQUIPMENT SHALL BE USED TO MAKE REQUIRED CALCULATIONS. 13. READINGS AND TEST OF DIFFUSERS, GRILLES, AND REGISTERS SHALL INCLUDE REQUIRED FPM VELOCITY AND TEST RESULTANT VELOCITY, REQUIRED CFM AND TEST RESULTANT CFM AFTER ADJUSTMENTS.
- 14. TAB AGENCY SHALL CHECK ALL CONTROLS TO ENSURE THEY ARE OPERATING AS SPECIFIED. PROVIDE THE CONTROL CONTRACTOR WITH SPECIFIC SET POINTS. 3.3 TEMPERATURE CONTROL SYSTEM
- A. IN THE PROGRESS OF PERFORMING THE TAB WORK, THE TAB AGENCY SHALL:
- 1. WORK WITH THE CONTROLS CONTRACTOR TO ENSURE THE MOST EFFECTIVE TOTAL SYSTEM OPERATION WITHIN THE DESIGN LIMITATIONS, AND TO OBTAIN MUTUAL UNDERSTANDING OF INTENDED CONTROL PERFORMANCE.
- 2. VERIFY THAT ALL CONTROL DEVICES ARE PROPERLY CONNECTED. 3. VERIFY THAT ALL DAMPERS, VALVES, AND OTHER CONTROLLED DEVICES ARE OPERATED BY THE INTENDED CONTROLLER.
- 4. VERIFY THAT ALL DAMPERS AND VALVES ARE IN THE POSITION INDICATED BY THE CONTROLLER (OPEN, CLOSED, OR MODULATING). 5. VERIFY THAT THE INTEGRITY OF VALVES AND DAMPERS IN TERMS OF TIGHTNESS OF CLOSE-OFF AND FULL-OPEN POSITION. THIS INCLUDES DAMPERS IN MULTI-ZONE UNITS.
- 6. CHECK THAT ALL VALVES ARE PROPERLY INSTALLED IN THE PIPING SYSTEM IN RELATION TO DIRECTION OF FLOW AND LOCATION. 7. VERIFY THE CALIBRATION OF ALL CONTROLLERS. 8. VERIFY THE PROPER APPLICATION OF ALL NORMALLY OPEN AND NORMALLY CLOSED
- VALVES. 9. CHECK THE LOCATIONS OF ALL THERMOSTATS AND HUMIDISTATS FOR POTENTIAL ERRATIC OPERATION FROM OUTSIDE INFLUENCES SUCH AS SUNLIGHT, DRAFTS, OR COLD WALLS. 10. CHECK THE LOCATIONS OF ALL SENSORS TO DETERMINE WHETHER THEIR POSITION WILL ALLOW THEM TO SENSE ONLY THE INTENDED TEMPERATURES OR PRESSURES OF THE
- MEDIA. CONTROLS CONTRACTOR WILL RELOCATE AS DEEMED NECESSARY BY THE TAB AGENCY. 11. CHECK THE SEQUENCE OF OPERATION FOR ANY CONTROL MODE IS IN ACCORDANCE WITH APPROVED SHOP DRAWINGS. VERIFY THAT ONLY MINIMUM SIMULTANEOUS HEATING AND COOLING OCCURS. OBSERVE THAT HEATING CANNOT TAKE PLACE UNTIL THE COOLING ZONE OF VALVE IS COMPLETELY CLOSED. 12. VERIFY THAT ALL CONTROLLER SET POINTS MEET THE DESIGN INTENT.
- 13. CHECK ALL DAMPERS FOR FREE TRAVEL. 14. VERIFY THE OPERATION OF ALL INTERLOCK SYSTEMS.
- 15. PERFORM ALL SYSTEM VERIFICATION TO ASSURE THE SAFETY OF THE SYSTEM AND ITS COMPONENTS.
- B. A SYSTEMATIC CHECK OF THE ABOVE REQUIREMENTS SHALL BE INCLUDED IN THE FINAL TAB REPORT.
- 3.4 DUCT LEAKAGE TEST
- A. ALL SUPPLY, RETURN, EXHAUST, AND OUTSIDE AIR DUCTWORK SHALL BE TESTED FOR LEAKS, USING NECESSARY INSTRUMENTS BEFORE INSULATING ANY DUCTWORK.
- B. DUCTWORK SHALL BE LEAK-TESTED IN ACCORDANCE WITH SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL. REPRESENTATIVE SECTIONS TOTALING NOT LESS THAN 10 PERCENT OF THE TOTAL INSTALLED DUCT AREA SHALL BE TESTED. WHERE THE TESTED 10 PERCENT FAILS TO COMPLY WITH THE REQUIREMENTS OF THIS SECTION, THEN 40 PERCENT OF THE TOTAL INSTALLED DUCT AREA SHALL BE TESTED. WHERE THE TESTED 40 PERCENT FAILS TO COMPLY WITH THE REQUIREMENTS OF THIS SECTION, THEN 100 PERCENT OF THE TOTAL INSTALLED DUCT AREA SHALL BE TESTED.
- C. THE MAXIMUM PERMITTED LEAKAGE SHALL BE DETERMINED IN ACCORDANCE WITH CMC 603.9.2. D. THE TEST AND BALANCE REPORT SHALL INCLUDE THE RESULTS OF THE DUCT LEAKAGE TEST
- FOR THE ENGINEER'S REVIEW.
- A. THE REPORT SHALL CONTAIN THE FOLLOWING DATA:
- 1. A LISTING OF THE MEASURED AIR QUANTITIES AT EACH OUTLET CORRESPONDING TO THE TEMPERATURE TABULATION SPECIFIED ABOVE.
- 2. AIR QUANTITIES AT EACH RETURN AND EXHAUST AIR HANDLING DEVICE (ONLY IF DUCTED RETURN SYSTEMS 3. STATIC PRESSURE READINGS ENTERING AND LEAVING EACH SUPPLY, RETURN AND EXHAUST
- FAN, FILTER, AND COIL OF THE SYSTEM. THESE READINGS SHALL BE RELATED TO FAN CURVES IN TERMS OF CFM HANDLED. 4. MOTOR CURRENT READINGS AT EACH FAN. THE VOLTAGES AT THE TIME OF THE READINGS SHALL BE LISTED.
- 3.6 FINAL ACCEPTANCE
- A. AT THE TIME OF FINAL INSPECTION, THE BALANCING AGENCY SHALL RECHECK, IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE, SPECIFIC AND RANDOM SELECTIONS OF DATA, I.E., WATER AND AIR QUANTITIES, RECORDED IN THE CERTIFIED REPORT.
- B. POINTS AND AREAS FOR RECHECK SHALL BE SELECTED BY THE OWNER'S REPRESENTATIVE. C. MEASUREMENT AND TEST PROCEDURES SHALL BE THE SAME AS APPROVED FOR WORK
- FORMING BASIS OF CERTIFIED REPORT.
- D. SELECTIONS FOR RECHECK, SPECIFIC PLUS RANDOM, WILL NOT NORMALLY EXCEED 25% OF THE TOTAL NUMBER TABULATED IN THE REPORT, EXCEPT THAT SPECIAL AIR SYSTEMS MAY REQUIRE A COMPLETE RECHECK FOR SAFETY REASONS.
- E. IF RANDOM TESTS ELICIT A MEASURED FLOW DEVIATION OF 10% OR MORE FROM THAT RECORDED IN THE CERTIFIED REPORT ON 10% OR MORE OF THE SELECTED RECHECK STATIONS, THE REPORT SHALL BE AUTOMATICALLY REJECTED. IN THE EVENT THE REPORT IS REJECTED, ALL SYSTEMS SHALL BE READJUSTED AND TESTED, NEW DATA RECORDED, NEW CERTIFIED REPORT SUBMITTED, AND NEW INSPECTION TESTS MADE, ALL AT NO ADDITIONAL COST TO THE OWNER.
- F. FOLLOWING FINAL ACCEPTANCE OF THE CERTIFIED REPORT BY THE OWNER'S REPRESENTATIVE, THE SETTINGS OF ALL VALVES, SPLITTER, DAMPERS, AND OTHER ADJUSTMENT DEVICES SHALL BE PERMANENTLY MARKED BY THE TAB AGENCY, SO THAT ADJUSTMENT CAN BE RESTORED IF DISTURBED AT ANY TIME. DEVICES SHALL NOT BE MARKED UNTIL AFTER FINAL ACCEPTANCE.

END OF SECTION

FRONTIER CONSULTING ENGINEERS 2727 Bechelli Lane - Redding, CA 96002 Ph: (530) 232-6160 - www.frontierce.com
ALL IDEAS, DESIGNS, AND PLANS REPRESENTED BY THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF FRONTIER CONSULTING ENGINEERS, INC. AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION. ANY UNAUTHORIZED REUSE OF THIS DRAWING SHEET OTHER THAN FOR THE PROJECT AND LOCATION SHOWN IS PROHIBITED.
LICENSE STAMP
KEY PLAN
PROJECT NAME
HVAC REPLACEMENT
FOR
HUMBOLDT COUNTY REGIONAL FACILITY
2004 HARRISON AVENUE EUREKA, CA 95501
NO. REVISIONS DATE
SHEET TITLE
TAB SPECIFICATIONS
ISSUED FOR: CONSTRUCTION DOCUMENTS
DATE: 9/20/2024 DRAWN BY: EG REVIEWED BY: NW SCALE: PROJECT NO: 22007
M102

	CONTROLS SPECIFICATION
PART 1 – GENERAL 1.1 WORK INCLUDED	 GENERAL NETWORK DESIGN SHALL INCLUDE THE FOLLOWING PROVIS a. HIGH-SPEED DATA TRANSFER RATES FOR ALARM REPORTING, QUI
A. FURNISH ALL LABOR, MATERIALS, EQUIPMENT, AND SERVICE NECESSARY TO MODIFY THE EXISTING ENERGY MANAGEMENT SYSTEM (EMS) FOR A COMPLETE AND OPERATIVE NEW EMS	GENERATION FROM MULTIPLE CONTROLLERS, AND UPLOAD/DOWN BETWEEN NETWORK DEVICES. THE MINIMUM BAUD RATE SHALL B b. SUPPORT OF ANY COMBINATION OF CONTROLLERS AND OPERATO
SYSTEM, UTILIZING DIRECT DIGITAL ELECTRONIC CONTROLS AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN. B. ALL LABOR, MATERIAL, EQUIPMENT, AND SOFTWARE NECESSARY TO MEET THE LISTED	DIRECTLY CONNECTED TO THE LOCAL AREA NETWORK. A MINIMU SHALL BE SUPPORTED ON A SINGLE LOCAL AREA NETWORK. c. DETECTION AND ACCOMMODATION OF SINGLE OR MULTIPLE FAILU WORKSTATIONS, DDC PANELS, OR THE NETWORK MEDIA. THE NE
FUNCTIONS OF THE EMS AS SPECIFIED HEREIN AND AS SHOWN ON THE DRAWINGS SHALL BE INCLUDED.	PROVISIONS FOR AUTOMATICALLY RECONFIGURING ITSELF TO AL EQUIPMENT TO PERFORM THEIR DESIGNATED FUNCTIONS AS EFF IN THE EVENT OF SINGLE OR MULTIPLE FAILURES.
C. CONTROL WIRING, EXCEPT FOR POWER WIRING, NECESSARY FOR TEMPERATURE CONTROL SYSTEMS IS COVERED IN THIS SECTION.	 d. MESSAGE AND ALARM BUFFERING TO PREVENT INFORMATION FR e. ERROR DETECTION, CORRECTION, AND RETRANSMISSION TO GUA INTEGRITY.
 1.2 STARTUP, OPERATING, AND MAINTENANCE SERVICE A. THE MANUFACTURER'S FIELD SERVICES REPRESENTATIVE SHALL FURNISH TECHNICAL DIRECTION AS REQUIRED TO ENSURE PROPER STARTUP, OPERATION, AND MAINTENANCE OF 	 f. DEFAULT DEVICE DEFINITION TO PREVENT LOSS OF ALARMS OR E ALARMS ARE REPORTED AS QUICKLY AS POSSIBLE IN THE EVENT DOES NOT RESPOND. g. COMMONLY AVAILABLE, MULTIPLE-SOURCED NETWORKING COMF
THE EQUIPMENT. B. OPERATION AND MAINTENANCE TRAINING OF THE OWNER'S STAFF SHALL BE PROVIDED. NOT	PROTOCOLS SHALL BE USED TO ALLOW THE EMS TO COEXIST WI APPLICATIONS, SUCH AS OFFICE AUTOMATION. MAP, ETHERNET, ARCNET ARE ACCEPTABLE TECHNOLOGIES.
LESS THAN 4 HOURS OF TRAINING SHALL BE PROVIDED AT TIMES CONVENIENT TO THE OWNER.	 h. USE OF AN INDUSTRY STANDARD IEEE 802.X PROTOCOL. COMMU A DETERMINISTIC NATURE TO ENSURE CALCULABLE PERFORMAN CASE NETWORK LOADING.
1.3 OPERATION AND MAINTENANCE MANUALS A. PROVIDE FIVE COPIES OF OPERATION AND MAINTENANCE MANUALS.	i. SYNCHRONIZATION OF THE REAL-TIME CLOCKS IN ALL DDC PANEL 2.5 STAND-ALONE DDC PANELS
B. MATERIAL SHALL BE CLEAN AND FILED UNDER DIVIDERS WITH HEADINGS IN ACCORDANCE WITH THE SPECIFICATION ITEM TITLE.	 A. GENERAL 1. STAND-ALONE DDC PANELS SHALL BE MICROPROCESSOR-BASED, MU
1.4 WARRANTY A. THE WORK AND MATERIALS COVERED IN THIS SECTION SHALL BE GUARANTEED FOR A PERIOD	MULTIUSER, REAL-TIME, DIGITAL CONTROL PROCESSORS. 2. EACH STAND-ALONE DDC PANEL SHALL CONSIST OF MODULAR HARD ENCLOSED PROCESSORS, COMMUNICATION CONTROLLERS, POWER
OF 1 YEAR FROM THE DATE OF ACCEPTANCE THEREOF AGAINST DEFECTIVE MATERIAL, DESIGN, AND WORKMANSHIP. PART 2 – PRODUCTS	INPUT/OUTPUT MODULES. 3. A SUFFICIENT NUMBER OF CONTROLLERS SHALL BE SUPPLIED TO FUL REQUIREMENTS OF THIS SPECIFICATION AND THE ATTACHED POINT L
	2.6 SYSTEM SOFTWARE FEATURES A. GENERAL
A. ALL COMPONENTS USED SHALL BE SERVICEABLE, REPAIRABLE, AND REPLACEABLE BY QUALIFIED TEMPERATURE CONTROL TECHNICIANS USING NONPROPRIETARY PARTS, TOOLS, AND INSTRUMENTS.	 ALL NECESSARY SOFTWARE TO FORM A COMPLETE OPERATING SYST THIS SPECIFICATION SHALL BE PROVIDED.
2.2 TEMPERATURE CONTROL MATERIAL	 THE SOFTWARE PROGRAMS SPECIFIED IN THIS SECTION SHALL BE PR INTEGRAL PART OF THE DDC PANEL AND SHALL NOT BE DEPENDENT U LEVEL COMPUTER FOR EXECUTION.
 A. ELECTRIC DAMPER ACTUATORS 1. ELECTRIC DAMPER ACTUATORS SHALL BE GEAR OR HYDRAULIC TYPE AS SCHEDULED. 2. ACTUATORS SHALL BE PROPERLY SIZED TO PROVIDE SUFFICIENT TORQUE TO POSITION THE 	2.7 APPLICATIONS-SPECIFIC CONTROLLERS, HVAC APPLCIATIONS A. EACH STAND-ALONE DDC CONTROLLER SHALL BE ABLE TO EXTEND ITS PE
DAMPER THROUGHOUT ITS OPERATING RANGE. 3. SPRING RETURN ACTUATORS SHALL BE USED WITH OUTSIDE AIR AND RELIEF AIR DAMPERS.	CAPACITY THROUGH THE USE OF REMOTE APPLICATION-SPECIFIC CONTR B. THE OPERATOR INTERFACE TO ANY ASC POINT DATA OR PROGRAMS SHA
 B. MOTORIZED CONTROL DAMPERS 1. MOTORIZED CONTROL DAMPERS SHALL BE PARALLEL BLADE FOR TWO-POSITION CONTROL 	NETWORK-RESIDENT PC WORKSTATION OR ANY PC OR PORTABLE OPER/ IS CONNECTED TO ANY DDC PANEL IN THE NETWORK.
 AND OPPOSED BLADE FOR PROPORTIONAL CONTROL APPLICATIONS. 2. DAMPERS SHALL BE BLACK ENAMEL FINISH, GALVANIZED, WITH NYLON BEARINGS. 3. BLADE EDGE AND TIP SEALS SHALL BE INCLUDED FOR ALL DAMPERS. 4. BLADES SHALL BE 16 GAUGE, MINIMUM, AND 10 INCHES WIDE, MAXIMUM THE FRAME SHALL 	 C. POWER FAIL PROTECTION 1. ALL SYSTEM SET POINTS, PROPORTIONAL BANDS, CONTROL ALGORIT PROGRAMMABLE PARAMETERS SHALL BE STORED SUCH THAT A POW
 BE WELDED CHANNEL IRON. DAMPERS WITH BOTH DIMENSIONS UNDER 18 INCHES MAY HAVE STRAP IRON FRAMES. 	DURATION DOES NOT NECESSITATE REPROGRAMMING THE CONTROL D. APPLICATION DESCRIPTION
 C. CONTROL VALVES 1. SHALL BE TWO-WAY OR THREE-WAY PATTERN AS SHOWN. 	1. VAV TERMINAL UNIT CONTROLLERS
 CONSTRUCTED FOR TIGHT SHUTOFF. SHALL OPERATE SATISFACTORILY AGAINST SYSTEM PRESSURES AND DIFFERENTIALS. VALVES WITH SIZES UP TO AND INCLUDING 2 INCHES SHALL BE SCREWED. 2 ½ INCH, AND LARGER VALVES SHALL BE FLANGED CONFIGURATION. 	 a. VAV TERMINAL UNIT CONTROLLER SHALL SUPPORT, BUT NOT BE L CONTROL OF THE FOLLOWING CONFIGURATIONS OF VAV BOXES T REQUIREMENTS, AS DESCRIBED IN THE EXECUTION PORTION OF T AND FOR FUTURE EXPANSION:
 CONTROL VALVES SHALL BE SIZED FOR A MAXIMUM PRESSURE DROP OF 4.0 PSIG AT RATED FLOW (EXCEPT AS NOTED). 	 SINGLE DUCT ONLY (COOLING ONLY OR COOLING WITH REHEA FAN POWERED (PARALLEL/SIDE POCKET, SERIES/ON-OFF LOG
 D. TEMPERATURE CONTROL PANELS (TCP) 1. FURNISH NEMA 1 (INTERIOR) OR NEMA 4 (EXTERIOR) TEMPERATURE CONTROL PANEL OF 	 3. DUAL DUCT (CONSTANT VOLUME, VARIABLE VOLUME) 4. SUPPLY/EXHAUST
 CODE GAUGE STEEL, WITH LOCKING DOORS, FOR MOUNTING AND DEVICES AS SHOWN. THEY SHALL MEET ALL APPLICABLE REQUIREMENTS OF TITLE 24, CALIFORNIA ADMINISTRATIVE CODE. ALL CONTROLLERS, RELAYS, SWITCHES, ETC., FOR EQUIPMENT LOCATED IN MECHANICAL 	 b. VAV TERMINAL UNIT CONTROLLERS SHALL SUPPORT THE FOLLOW INPUTS AND OUTPUTS: 1. PROPORTIONAL COOLING OUTPUTS
 ALL CONTROLLERS, RELATS, SWITCHES, ETC., FOR EQUIPMENT ECCATED IN MEET ECCATED IN	 2. BOX AND BASEBOARD HEATING OUTPUTS (PROPORTIONAL, O STAGES) 3. FAN CONTROL OUTPUT (ON/OFF LOGIC, OR PROPORTIONAL SI
 PROVIDE ENGRAVED, LAMINATED PLASTIC NAMEPLATES IDENTIFYING ALL DEVICES MOUNTED ON THE FACE OF THE CONTROL PANEL. A COMPLETE SET OF RELATED "AS-BUILT" CONTROL DRAWINGS SHALL BE FURNISHED IN 	c. THE MODES OF OPERATION SUPPORTED BY THE VAV TERMINAL U SHALL MINIMALLY INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOW
EACH CONTROL PANEL. E. ELECTRONIC THERMOMETERS	 DAY/WEEK SCHEDULE COMFORT/OCCUPANCY MODE ECONOMY MODE (STANDBY MODE, UNOCCUPIED, ETC.)
 SHALL HAVE 2 PERCENT ACCURACY AND 1 ½ DEGREES REPEATABILITY. SHALL BE MOUNTED ON THE TEMPERATURE CONTROL PANELS AS SHOWN ON THE TEMPERATURE CONTROL DIAGRAMS. 	 d. OCCUPANCY-BASED STANDBY/COMFORT MODE CONTROL
2.3 GENERAL PRODUCT DESCRIPTION	1. EACH VAV TERMINAL UNIT CONTROLLER SHALL HAVE A PROVI SENSING OVERRIDES.
A. THE ENERGY MANAGEMENT SYSTEM SHALL BE CAPABLE OF INTEGRATING MULTIPLE BUILDING FUNCTIONS, INCLUDING EQUIPMENT SUPERVISION AND CONTROL, ALARM MANAGEMENT, ENERGY MANAGEMENT, AND HISTORICAL DATA COLLECTION AND ARCHIVING.	 BASED UPON THE CONTACT STATUS OF EITHER A MANUAL WA OCCUPANCY-SENSING DEVICE, THE VAV TERMINAL UNIT CONT AUTOMATICALLY SELECT EITHER STANDBY OR COMFORT MOD HEATING AND COOLING REQUIREMENTS, WHILE SATISFYING CO
 B. THE ENERGY MANAGEMENT SYSTEM SHALL CONSIST OF THE FOLLOWING: 1. STAND-ALONG DDC PANELS. 	e. CONTINUOUS ZONE TEMPERATURE HISTORIES
 STAND-ALONE APPLICATION-SPECIFIC CONTROLLERS (ASCS). PORTABLE OPERATOR'S TERMINALS. C. THE SYSTEM SHALL BE MODULAR IN NATURE AND SHALL PERMIT EXPANSION OF BOTH CAPACITY 	 EACH VAV TERMINAL UNIT CONTROLLER SHALL AUTOMATICAL MAINTAIN A HISTORY OF THE ASSOCIATED ZONE TEMPERATUI QUICKLY ANALYZE SPACE COMFORT AND EQUIPMENT PERFOI 24 HOURS.
AND FUNCTIONALITY THROUGH THE ADDITION OF SENSORS, ACTUATORS, STAND-ALONG DDC PANELS, AND OPERATOR DEVICES.	2. A MINIMUM OF TWO SAMPLES PER HOUR SHALL BE STORED.f. ALARM MANAGEMENT
D. SYSTEM ARCHITECTURAL DESIGN ELIMINATES DEPENDENCE UPON ANY SINGLE DEVICE FOR ALARM REPORTING AND CONTROL EXECUTION.	1. EACH VAV TERMINAL UNIT CONTROLLER SHALL PERFORM ITS MONITORING AND ANALYSIS TO MAXIMIZE NETWORK PERFORI
 E. EACH DDC PANEL SHALL OPERATE INDEPENDENTLY BY PERFORMING ITS OWN SPECIFIED CONTROL, ALARM MANAGEMENT, OPERATOR I/O, AND HISTORICAL DATA COLLECTION. E. THE FAILURE OF ANY CINCLE COMPONENT OF NETWORK CONNECTION SHALL NOT INTERPUT. 	UNNECESSARY COMMUNICATIONS. 2. UNITARY CONTROLLERS
 F. THE FAILURE OF ANY SINGLE COMPONENT OR NETWORK CONNECTION SHALL NOT INTERRUPT THE EXECUTION OF CONTROL STRATEGIES AT OTHER OPERATIONAL DEVICES. G. STAND-ALONE DDC PANELS SHALL BE ABLE TO ACCESS ANY DATA FROM OR SEND CONTROL 	a. UNITARY CONTROLLERS SHALL SUPPORT, BUT NOT BE LIMITED TO TYPES OF SYSTEMS TO ADDRESS SPECIFIC APPLICATIONS DESCR EXECUTION PORTION OF THIS SPECIFICATION, AND FOR FUTURE E
COMMANDS AND ALARM REPORTS DIRECTLY TO ANY OTHER DDC PANEL OR COMBINATION OF PANELS ON THE NETWORK WITHOUT DEPENDENCE UPON A CENTRAL PROCESSING DEVICE.	 UNIT VENTS (ASHRAE CYCLE I, II, III, OR W) HEAT PUMPS (AIR-TO-AIR, WATER-TO-AIR)
 H. STAND-ALONE DDC PANELS SHALL ALSO BE ABLE TO SEND ALARM REPORTS TO MULTIPLE- OPERATOR WORKSTATIONS WITHOUT DEPENDENCE UPON A CENTRAL PROCESSING DEVICE. 2.4 NETWORKING/COMMUNICATIONS 	 3. PACKAGE ROOFTOPS 4. FAN COILS (TWO-PIPE, FOUR-PIPE) b. UNITARY CONTROLLERS SHALL SUPPORT THE FOLLOWING TYPES
A. THE DESIGN OF THE EMS NETWORK OPERATOR WORKSTATIONS AND STAND-ALONE DDC PANELS, AS SHOWN ON THE DRAWINGS.	0UTPUTS: 1. ECONOMIZER SWITCHOVER INPUTS
 B. INHERENT IN THE SYSTEM'S DESIGN SHALL BE THE ABILITY TO EXPAND OR MODIFY THE NETWORK. 	a. DRY BULBb. OUTDOOR AIR ENTHALPY
C. LOCAL AREA NETWORK:	 c. DIFFERENTIAL TEMPERATURE d. BINARY INPUT FROM A SEPARATE CONTROLLER 2. ECONOMIZER OUTPUTS
 WORKSTATION.DDC PANEL SUPPORT a. DDC PANELS SHALL DIRECTLY RESIDE ON A LOCAL AREA NETWORK SUCH THAT COMMUNICATIONS MAY BE EXECUTED DIRECTLY BETWEEN CONTROLLERS, DIRECTLY 	 ECONOMIZER OUTPUTS a. INTEGRATED ANALOG, WITH MINIMUM POSITION b. BINARY OUTPUT TO ENABLE SELF-CONTAINED ECONOMIZ
BETWEEN WORKSTATIONS, AND BETWEEN CONTROLLERS AND WORKSTATIONS ON A PEER-TO-PEER BASIS.	 c. HEATING AND COOLING OUTPUTS d. ONE TO THREE STAGES e. ANALOG OUTPUT, WITH TWO-PIPE LOGIC
 DYNAMIC DATA ACCESS a. ALL OPERATOR DEVICES, EITHER NETWORK RESIDENT OR CONNECTED VIA DIAL-UP MODEMS, SHALL HAVE THE ABILITY TO ACCESS ALL POINT STATUS AND APPLICATION 	f. REVERSING VALVE LOGIC FOR HEAT PUMPS3. FAN OUTPUT
REPORT DATA OR EXECUTE CONTROL FUNCTIONS FOR ANY AND ALL OTHER DEVICES VIA THE LOCAL AREA NETWORK. b. ACCESS TO DATA SHALL BE BASED UPON LOGICAL IDENTIFICATION OF BUILDING	a. ON/OFF LOGIC CONTROL c. UNITARY CONTROLLERS SHALL SUPPORT THE FOLLOWING LIBRA
EQUIPMENT. c. ACCESS TO SYSTEM DATA SHALL NOT BE RESTRICTED BY THE HARDWARE CONFIGURATION OF THE ENERGY MANAGEMENT SYSTEM.	STRATEGIES TO ADDRESS THE REQUIREMENTS OF THE SEQUEN EXECUTION PORTION OF THIS SPECIFICATION, AND FOR FUTURE
 d. THE HARDWARE CONFIGURATION OF THE EMS NETWORK SHALL BE TOTALLY TRANSPARENT TO THE USER WHEN ACCESSING DATA OR DEVELOPING CONTROL PROGRAMS. 	 DAILY/WEEKLY SCHEDULES COMFORT/OCCUPANCY MODE ECONOMY MODE
	 a. STANDBY MODE/ECONOMIZER AVAILABLE b. UNOCCUPIED/ECONOMIZER NOT AVAILABLE c. SHUTDOWN
	 d. LIGHTING LOGIC INTERLOCK TO ECONOMY MODE 4. TEMPORARY OVERRIDE MODE
	a. TEMPORARY COMFORT MODE (OCCUPANCY-BASED CONTb. BOOST (OCCUPANT WARMER/COOLER CONTROL)
	d. OCCUPANCY-BASE STANDBY/COMFORT MODE CONTROL 1. EACH UNITARY CONTROLLER SHALL HAVE A PROVISION FOR C
	 EACH UNITARY CONTROLLER SHALL HAVE A PROVISION FOR C OVERRIDES. BASED UPON THE CONTACT STATUS OF EITHER A MANUAL WA

NTROLS SPECIFICATION

D DATA TRANSFER RATES FOR ALARM REPORTING, QUICK REPORT IN FROM MULTIPLE CONTROLLERS, AND UPLOAD/DOWNLOAD EFFICIENCY ETWORK DEVICES. THE MINIMUM BAUD RATE SHALL BE 2.5 MEGABAUD. OF ANY COMBINATION OF CONTROLLERS AND OPERATOR WORKSTATIONS CONNECTED TO THE LOCAL AREA NETWORK. A MINIMUM OF 50 DEVICES UPPORTED ON A SINGLE LOCAL AREA NETWORK. AND ACCOMMODATION OF SINGLE OR MULTIPLE FAILURES OF EITHER IONS, DDC PANELS, OR THE NETWORK MEDIA. THE NETWORK SHALL INCLUDE S FOR AUTOMATICALLY RECONFIGURING ITSELF TO ALLOW ALL OPERATIONAL TO PERFORM THEIR DESIGNATED FUNCTIONS AS EFFECTIVELY AS POSSIBLE NT OF SINGLE OR MULTIPLE FAILURES. AND ALARM BUFFERING TO PREVENT INFORMATION FROM BEING LOST. ECTION, CORRECTION, AND RETRANSMISSION TO GUARANTEE DATA EVICE DEFINITION TO PREVENT LOSS OF ALARMS OR DATA, AND ENSURE E REPORTED AS QUICKLY AS POSSIBLE IN THE EVENT AN OPERATOR DEVICE

RESPOND. AVAILABLE, MULTIPLE-SOURCED NETWORKING COMPONENTS AND S SHALL BE USED TO ALLOW THE EMS TO COEXIST WITH OTHER NETWORKING NS, SUCH AS OFFICE AUTOMATION. MAP, ETHERNET, IBM TOKEN RING, AND E ACCEPTABLE TECHNOLOGIES. INDUSTRY STANDARD IEEE 802.X PROTOCOL. COMMUNICATIONS MUST BE OF NISTIC NATURE TO ENSURE CALCULABLE PERFORMANCE UNDER WORST-/ORK LOADING. IZATION OF THE REAL-TIME CLOCKS IN ALL DDC PANELS SHALL BE PROVIDED. NELS

DDC PANELS SHALL BE MICROPROCESSOR-BASED, MULTITASKING, AL-TIME, DIGITAL CONTROL PROCESSORS. ONE DDC PANEL SHALL CONSIST OF MODULAR HARDWARE, WITH PLUGOIN DCESSORS, COMMUNICATION CONTROLLERS, POWER SUPPLIES, AND MODULES. IUMBER OF CONTROLLERS SHALL BE SUPPLIED TO FULLY MEET THE S OF THIS SPECIFICATION AND THE ATTACHED POINT LIST. EATURES

Y SOFTWARE TO FORM A COMPLETE OPERATING SYSTEM AS DESCRIBED IN TION SHALL BE PROVIDED. PROGRAMS SPECIFIED IN THIS SECTION SHALL BE PROVIDED AS AN T OF THE DDC PANEL AND SHALL NOT BE DEPENDENT UPON ANY HIGHER-ER FOR EXECUTION.

IC CONTROLLERS, HVAC APPLCIATIONS E DDC CONTROLLER SHALL BE ABLE TO EXTEND ITS PERFORMANCE AND

H THE USE OF REMOTE APPLICATION-SPECIFIC CONTROLLERS (ASCS). TERFACE TO ANY ASC POINT DATA OR PROGRAMS SHALL BE THROUGH ANY NT PC WORKSTATION OR ANY PC OR PORTABLE OPERATOR'S TERMINAL THAT **PART 3 – EXECUTION** ANY DDC PANEL IN THE NETWORK.

ECTION T POINTS, PROPORTIONAL BANDS, CONTROL ALGORITHMS, AND ANY OTHER LE PARAMETERS SHALL BE STORED SUCH THAT A POWER FAILURE OF ANY S NOT NECESSITATE REPROGRAMMING THE CONTROLLER.

IAL UNIT CONTROLLER SHALL SUPPORT, BUT NOT BE LIMITED TO, THE OF THE FOLLOWING CONFIGURATIONS OF VAV BOXES TO ADDRESS CURRENT ENTS, AS DESCRIBED IN THE EXECUTION PORTION OF THIS SPECIFICATION, JTURE EXPANSION:

IAL UNIT CONTROLLERS SHALL SUPPORT THE FOLLOWING TYPES OF POINT OUTPUTS: RTIONAL COOLING OUTPUTS

D BASEBOARD HEATING OUTPUTS (PROPORTIONAL, OR ONE TO THREE NTROL OUTPUT (ON/OFF LOGIC, OR PROPORTIONAL SERIES FAN LOGIC)

S OF OPERATION SUPPORTED BY THE VAV TERMINAL UNIT CONTROLLERS MALLY INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:

AV TERMINAL UNIT CONTROLLER SHALL HAVE A PROVISION FOR OCCUPANCY-G OVERRIDES. UPON THE CONTACT STATUS OF EITHER A MANUAL WALL SWITCH OR AN ANCY-SENSING DEVICE, THE VAV TERMINAL UNIT CONTROLLER SHALL ATICALLY SELECT EITHER STANDBY OR COMFORT MODE TO MINIMIZE THE

G AND COOLING REQUIREMENTS, WHILE SATISFYING COMFORT CONDITIONS. JS ZONE TEMPERATURE HISTORIES

AV TERMINAL UNIT CONTROLLER SHALL AUTOMATICALLY AND CONTINUOUSLY AIN A HISTORY OF THE ASSOCIATED ZONE TEMPERATURE TO ALLOW USERS TO 3.3 MATERIAL AND EQUIPMENT INSTALLATION ANALYZE SPACE COMFORT AND EQUIPMENT PERFORMANCE FOR THE PAST UM OF TWO SAMPLES PER HOUR SHALL BE STORED.

AGEMENT AV TERMINAL UNIT CONTROLLER SHALL PERFORM ITS OWN LIMIT AND STATUS

RING AND ANALYSIS TO MAXIMIZE NETWORK PERFORMANCE BY REDUCING ESSARY COMMUNICATIONS. ROLLERS

ONTROLLERS SHALL SUPPORT, BUT NOT BE LIMITED TO, THE FOLLOWING SYSTEMS TO ADDRESS SPECIFIC APPLICATIONS DESCRIBED IN THE I PORTION OF THIS SPECIFICATION, AND FOR FUTURE EXPANSION:

ILS (TWO-PIPE, FOUR-PIPE) ONTROLLERS SHALL SUPPORT THE FOLLOWING TYPES OF POINT INPUTS AND

ARY OUTPUT TO ENABLE SELF-CONTAINED ECONOMIZER ACTUATOR TING AND COOLING OUTPUTS TO THREE STAGES

OFF LOGIC CONTROL ONTROLLERS SHALL SUPPORT THE FOLLOWING LIBRARY OF CONTROL S TO ADDRESS THE REQUIREMENTS OF THE SEQUENCES DESCRIBED IN THE I PORTION OF THIS SPECIFICATION, AND FOR FUTURE EXPANSION:

NITARY CONTROLLER SHALL HAVE A PROVISION FOR OCCUPANCY-SENSING DES. UPON THE CONTACT STATUS OF EITHER A MANUAL WALL SWITCH OR AN ANCY-SENSING DEVICE, THE UNITARY CONTROLLER SHALL AUTOMATICALLY EITHER STANDBY OR COMFORT MODE TO MINIMIZE THE HEATING AND G REQUIREMENTS, WHILE SATISFYING COMFORT CONDITIONS.

e. CONTINUOUS ZONE TEMPERATURE HISTORIES

1. EACH UNITARY CONTROLLER SHALL AUTOMATICALLY AND CONTINUOUSLY MAINTAIN A HISTORY OF THE ASSOCIATED ZONE TEMPERATURE TO ALLOW USERS TO QUICKLY ANALYZE SPACE COMFORT AND EQUIPMENT PERFORMANCE FOR THE PAST 24 HOURS. A MINIMUM OF TWO SAMPLES PER HOUR SHALL BE STORED.

f. ALARM MANAGEMENT

1. EACH UNITARY CONTROLLER SHALL PERFORM ITS OWN LIMIT AND STATUS MONITORING AND ANALYSIS TO MAXIMIZE NETWORK PERFORMANCE BY REDUCING UNNECESSARY COMMUNICATIONS.

3. AHU CONTROLLERS

a. AHU CONTROLLERS SHALL SUPPORT, BUT NOT BE LIMITED TO, THE FOLLOWING CONFIGURATIONS OF SYSTEMS TO ADDRESS CURRENT REQUIREMENTS, AS DESCRIBED IN THE EXECUTION PORTION OF THIS SPECIFICATION, AND FOR FUTURE EXPANSION: 1. LARGE AIR HANDLING UNITS

a. MIXED AIR – SINGLE PATH

b. MIXED AIR – DUAL PATH c. 100-PERCENT SINGLE PATH d. 100-PERCENT DUAL PATH

b. AHU CONTROLLERS SHALL SUPPORT ALL OF THE NECESSARY POINT INPUTS AND OUTPUTS TO PERFORM THE SPECIFIED CONTROL SEQUENCES IN A TOTALLY STAND-

ALONE FASHION. c. AHU CONTROLLERS SHALL HAVE A LIBRARY OF CONTROL ROUTINES AND PROGRAM LOGIC TO PERFORM THE SEQUENCES OF OPERATION, AS SPECIFIED IN THE EXECUTION PORTION OF THIS SPECIFICATION.

d. OCCUPANCY-BASED STANDBY/COMFORT MODE CONTROL

1. EACH AHU CONTROLLER SHALL HAVE A PROVISION FOR OCCUPANCY-SENSING OVERRIDES. 2. BASED UPON THE CONTACT STATUS OF EITHER A MANUAL WALL SWITCH OR AN OCCUPANCY-SENSING DEVICE, THE AHU CONTROLLER SHALL AUTOMATICALLY SELECT EITHER STANDBY OR COMFORT MODE TO MINIMIZE THE HEATING AND COOLING REQUIREMENTS, WHILE SATISFYING COMFORT CONDITIONS.

e. CONTINUOUS ZONE TEMPERATURE HISTORIES

1. EACH AHU CONTROLLER SHALL AUTOMATICALLY AND CONTINUOUSLY MAINTAIN A HISTORY OF THE ASSOCIATED ZONE TEMPERATURE TO ALLOW USERS TO QUICKLY ANALYZE SPACE COMFORT AND EQUIPMENT PERFORMANCE FOR THE PAST 24 HOURS.

2. A MINIMUM OF TWO SAMPLES PER HOUR SHALL BE STORE.

f. ALARM MANAGEMENT

1. EACH AHU CONTROLLER SHALL PERFORM ITS OWN LIMIT AND STATUS MONITORING AND ANALYSIS TO MAXIMIZE NETWORK PERFORMANCE BY REDUCING UNNECESSARY COMMUNICATIONS.

3.1 GENERAL

A. WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER BY CRAFTSMAN SKILLED IN THE PARTICULAR TRADE. WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS, MANUFACTURER'S RECOMMENDATIONS, AND THE BEST PRACTICE IN THE TRADE. COMPLETED WORK SHALL PRESENT A NEAT AND FINISHED APPEARANCE.

B. COORDINATE WORK WITH THE OWNER AND THE WORK OF OTHER TRADES TO AVOID CONFLICTS, ERRORS, DELAYS, AND UNNECESSARY INTERFERENCE DURING CONSTRUCTION.

C. ALL THERMOSTATS OR TEMPERATURE SENSORS IN THE CONDITIONED SPACE SHALL HAVE BLANK LOCKING COVERS. FURNISH CAST ALUMINUM GUARDS WHERE SHOWN ON THE PLANS.

D. IDENTIFY EACH ITEM MOUNTED ON THE FACE OF A CONTROL PANEL WITH AN ENGRAVED, PHENOLIC LABEL (1/4 –INCH HIGH ENGRAVED LETTERS, MINIMUM), IDENTIFY EACH ITEM OF CONTROL EQUIPMENT (EXCEPT ROOM SENSORS AND THERMOSTATS) WITH STAMPED TAPE FIRMLY ATTACHED TO EQUIPMENT.

E. ALL CONTROL ADJUSTMENTS SHALL BE ACCESSIBLE WITHOUT USE OF A LADDER.

F. THERMOSTATS OR SENSORS MOUNTED ON OUTSIDE WALLS SHALL BE MOUNTED ON 1-INCH MINIMUM THICKNESS RIGID FIBERGLASS INSULATING BASE (OR EQUAL). G. ALL THERMAL SENSORS IN WATER LINES HALL BE THE DIRECT-IMMERSION TYPE. INSTALLED

THROUGH A "DIRECT-IMMERSION FITTING" CONSISTING OF AN ISOLATION VALVE AND TEFLON PACKING. 3.2 PROTECTION DURING CONSTRUCTION

A. THROUGHOUT THE CONTRACT. PROVIDE PROTECTION FOR MATERIALS AND EQUIPMENT AGAINST LOSS OR DAMAGE AND FROM THE EFFECTS OF WEATHER.

B. PRIOR TO INSTALLATION, STORE ITEMS TO BE INSTALLED IN INDOOR LOCATIONS.

C. ITEMS SUBJECT TO CORROSION UNDER DAMP CONDITIONS AND ITEMS CONTAINING INSULATION, SUCH AS TRANSFORMERS, MOTORS, AND CONTROLS, SHALL BE STORED IN INDOOR, HEATED, DRY LOCATIONS.

D. FOLLOWING INSTALLATION, PROTECT MATERIALS, EQUIPMENT, AND INSULATION FROM CORROSION, PHYSICAL DAMAGE, AND MOISTURE.

E. CAP CONDUIT RUNS DURING CONSTRUCTION WITH MANUFACTURED SEALS.

F. KEEP OPENINGS IN BOXES OR EQUIPMENT CLOSED DURING CONSTRUCTION.

G. PROVIDE TEMPORARY HEATING SOURCE FOR ELECTRICAL EQUIPMENT IN DAMP LOCATIONS OR LOCATIONS SUBJECT TO CONDENSATION, INCLUDING TRANSFORMERS, MOTORS, AND CONTROLS, UNTIL CONSTRUCTION IS COMPLETE AND EQUIPMENT IS ENERGIZED.

A. FOLLOW THE MANUFACTURER'S INSTALLATION RECOMMENDATIONS UNLESS OTHERWISE

INDICATED. B. FOLLOW THE ENGINEER'S DECISION, AT NO ADDITIONAL COST TO THE OWNER, WHEREVER ANY CONFLICT ARISES BETWEEN THE MANUFACTURER'S INSTRUCTION, STATE, OR OTHER CODES

AND REGULATIONS, AND THESE CONTRACT DOCUMENTS. C. KEEP COPY OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AVAILABLE ON THE JOBSITE FOR REVIEW AT ALL TIMES.

D. INSTALL FREESTANDING EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. UNLESS NOTED OTHERWISE, MOUNT FREESTANDING EQUIPMENT ON A 3 1/2 INCH CONCRETE PAD.

SECURE MOTOR CONTROL CENTERS (MCCS) AND OTHER FREESTANDING EQUIPMENT RIGIDLY TO FLOORS TO MOUNTING PADS WITH ANCHOR BOLTS, EXPANSION SHIELDS, OR OTHER APPROVED MEANS.

F. GROUT MOUNTING CHANNELS PROVIDED WITH MCCS INTO THE FLOOR OR MOUNTING PADS, UNLESS THE MCCS ARE FIRMLY ANCHORED WITH THE SPECIFIED CONCRETE ANCHORS, IN WHICH CASE THE CHANNELS ARE NOT REQUIRED. 3.4 CUTTING AND PATCHING

A. DO NOT CUT OR NOTCH ANY STRUCTURAL MEMBER OR BUILDING SURFACE WITHOUT SPECIFIC APPROVAL OF THE ENGINEER.

B. WHERE POSSIBLE, AVOID ANY CUTTING, CHANNELING, CHASING, OR DRILLING OF FLOORS, WALLS, PARTITIONS, CEILINGS, PAVING, OR OTHER SURFACES.

C. USE CLAMPS AND CHANNEL WHERE REQUIRED FOR THE INSTALLATION, SUPPORT, OR ANCHORAGE OF CONDUIT, RACEWAYS, OR OTHER ELECTRICAL MATERIALS AND EQUIPMENT.

D. FOLLOWING SUCH WORK, RESTORE SURFACES NEATLY TO NEW CONDITION USING SKILLED CRAFTSMEN OF THE TRADES INVOLVED, AT NO ADDITIONAL COST TO THE OWNER. 3.5 CLEANING AND TOUCHUP PAINTING

A. KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIAL OR RUBBISH.

B. UPON COMPLETION OF WORK, REMOVE MATERIALS, SCRAPS, AND DEBRIS FROM THE PREMISES AND FROM THE INTERIOR AND EXTERIOR OF ALL DEVICES AND EQUIPMENT.

. REFINISH DAMAGED SURFACES TO NEW CONDITION USING SKILLED CRAFTSMEN OF THE TRADES INVOLVED, AT NO ADDITIONAL COST TO THE OWNER. 3.6 INSTALLATION

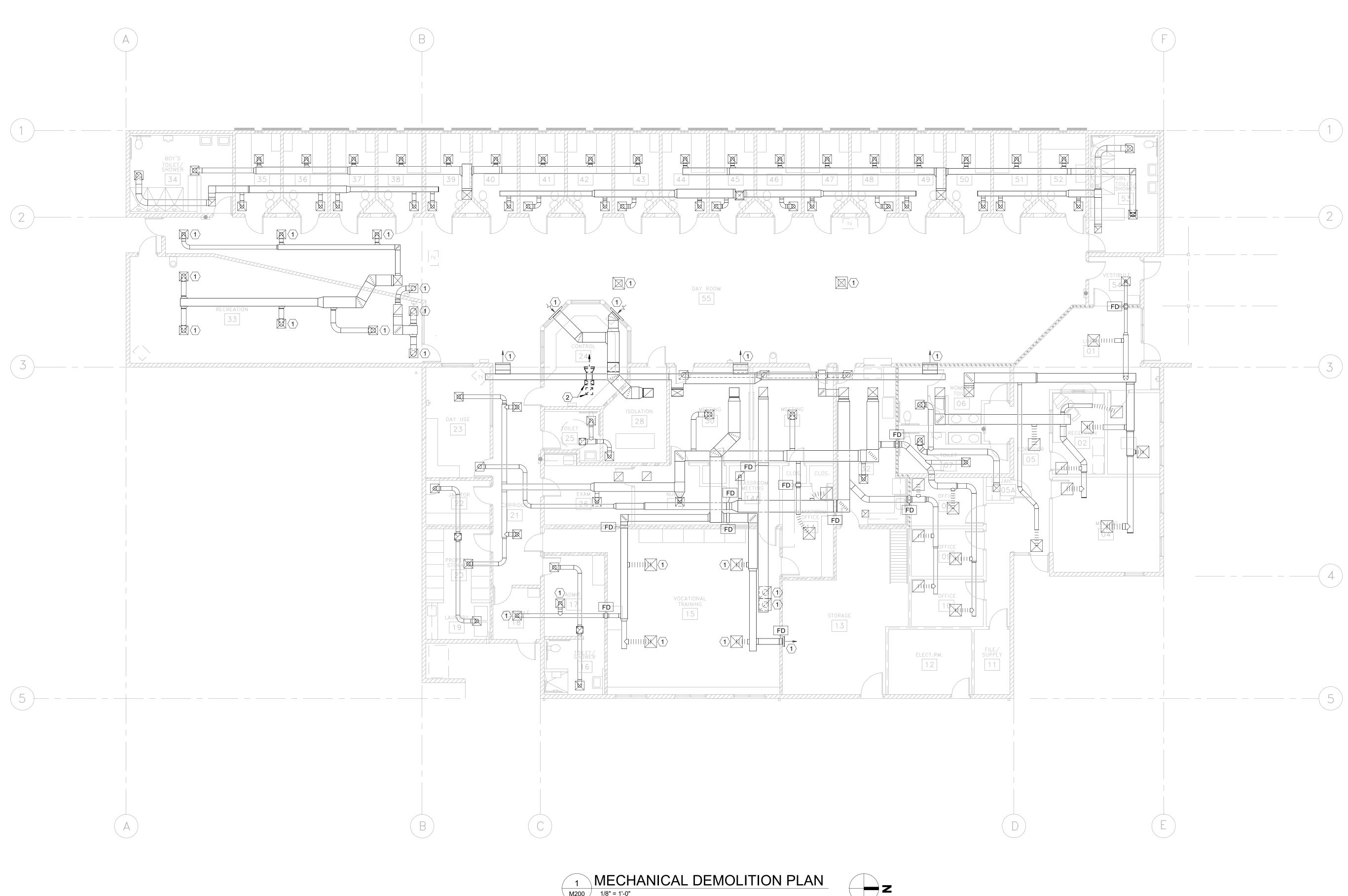
A. ELECTRICAL WORK

1. ALL TEMPERATURE CONTROL AND INTERLOCK WIRING SHALL BE PLENUM-RATED CABLE. 2. POWER OR INTERLOCK WIRING SHALL BE RUN IN SEPARATE CONDUIT FORM SENSOR

3. WIRING SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE. 4. ALL WIRING OF ANY NATURE IN CONNECTION WITH TEMPERATURE CONTROL SYSTEM, REGARDLESS OF VOLTAGE, INCLUDING TEMPERATURE CONTROL WIRING, INTERLOCKING, AND THE LIKE, SHALL BE INCLUDED IN THE AIR CONDITIONING WORK.

END OF SECTION

ERONTIER CONSULTING ENGINEERS 2727 Bechelli Lane - Redding, CA 96002 Ph: (530) 232-6160 - www.frontierce.com
ALL IDEAS, DESIGNS, AND PLANS REPRESENTED BY THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF FRONTIER CONSULTING ENGINEERS, INC. AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION. ANY UNAUTHORIZED REUSE OF THIS DRAWING SHEET OTHER THAN FOR THE PROJECT AND LOCATION SHOWN IS PROHIBITED.
LICENSE STAMP
PROJECT NAME
HVAC REPLACEMENT
FOR
HUMBOLDT COUNTY REGIONAL FACILITY
2004 HARRISON AVENUE EUREKA, CA 95501
NO. REVISIONS DATE
SHEET TITLE
CONTROL SPECIFICATIONS
ISSUED FOR: CONSTRUCTION DOCUMENTS
DATE: 9/20/2024 DRAWN BY: EG REVIEWED BY: NW
SCALE: PROJECT NO: 22007
M103

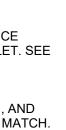


1 MECHANICAL DEMOLITION PLAN M200 1/8" = 1'-0"

KEYED NOTES:

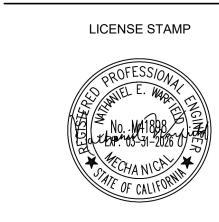
(1) CONDUCT PRE-CONSTRUCTION AIR BALANCE TESTING FOR EXISTING AIR INLET OR OUTLET. SEE AIR BALANCE PROCEDURES ON M100 FOR ADDITIONAL INFORMATION.

 $\langle 2 \rangle$ REMOVE EXISTING DUCT DROPS, DUCTING, AND REGISTERS. PATCH WALL AND CEILING TO MATCH.





ALL IDEAS, DESIGNS, AND PLANS REPRESENTED BY THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF FRONTIER CONSULTING ENGINEERS, INC. AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION. ANY UNAUTHORIZED REUSE OF THIS DRAWING SHEET OTHER THAN FOR THE PROJECT AND LOCATION SHOWN IS PROHIBITED.



KEY PLAN

PROJECT NAME

HVAC REPLACEMENT

FOR

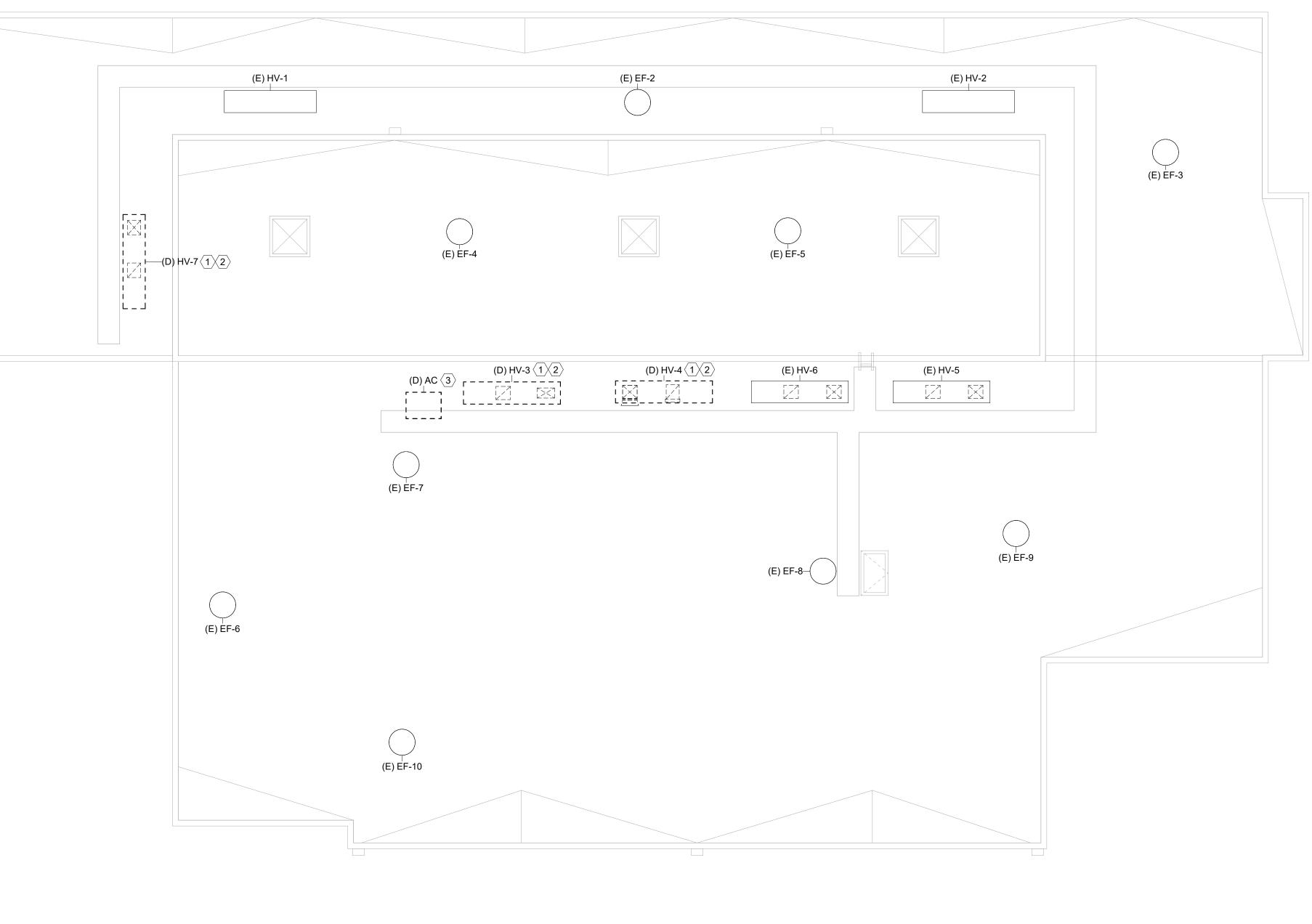
HUMBOLDT COUNTY REGIONAL FACILITY

2004 HARRISON AVENUE EUREKA, CA 95501

NO.	REVISIONS	DATE
	SHEET TITLE	Ē
	MECHANIC MOLITION	
	ISSUED FOR	R:
	ONSTRUC DOCUMEN	
DATE: DRAWN	RV.	9/20/2024 EG
REVIEW		NW 1/8" = 1'-0"
SCALE:		

(E) EF-1

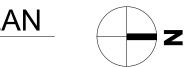
+----

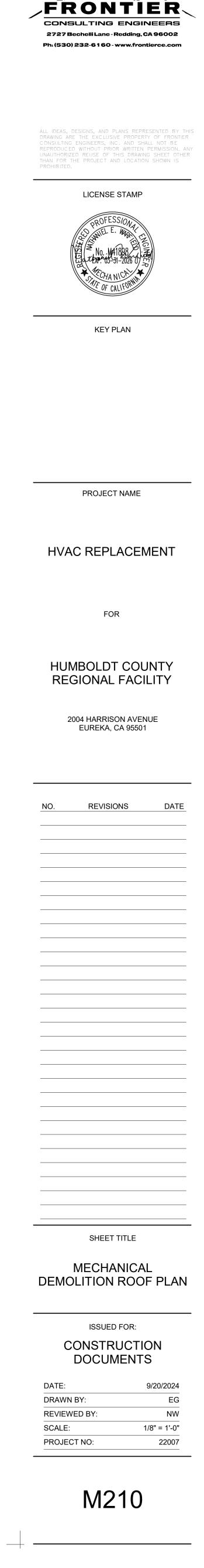


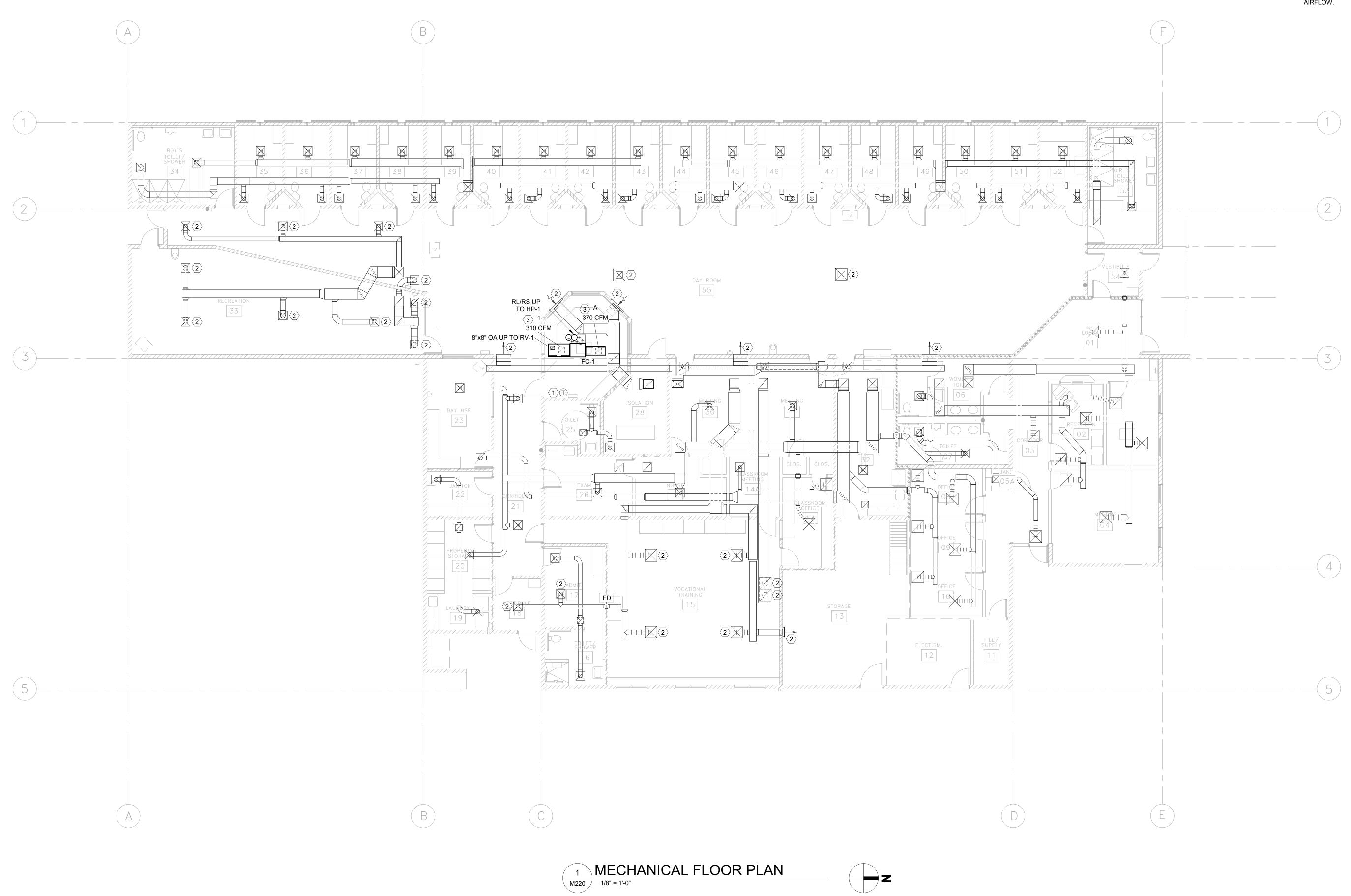
1 MECHANICAL DEMOLITION ROOF PLAN M210 1/8" = 1'-0"

KEYED NOTES:

- (1) REMOVE EXISTING ROOFTOP UNIT AND ASSOCIATED CURB. PREPARE LOCATION FOR INSTALLATION ON NEW CURB.
- 2 CONDUCT PRE-CONSTRUCTION AIR BALANCE TESTING FOR EXISTING HEATING VENTILATOR. SEE AIR BALANCE PROCEDURES ON M100 FOR ADDITIONAL INFORMATION.
- (3) REMOVE EXISTING ROOFTOP UNIT AND ASSOCIATED CURB. PATCH ROOF TO MATCH EXISTING.

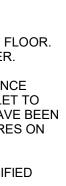






KEYED NOTES:

- (1) MOUNT THERMOSTAT 48" ABOVE FINISHED FLOOR. COORDINATE FINAL LOCATION WITH OWNER.
- 2 CONDUCT POST-CONSTRUCTION AIR BALANCE TESTING FOR EXISTING AIR INLET OR OUTLET TO VERIFY PRE-CONSTRUCTION AIRFLOWS HAVE BEEN MAINTAINED. SEE AIR BALANCE PROCEDURES ON M100 FOR ADDITIONAL INFORMATION.
- $\langle \mathbf{3} \rangle$ balance air terminal to achieve specified airflow.





ALL IDEAS, DESIGNS, AND PLANS REPRESENTED BY THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF FRONTIER CONSULTING ENGINEERS, INC. AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION. ANY UNAUTHORIZED REUSE OF THIS DRAWING SHEET OTHER THAN FOR THE PROJECT AND LOCATION SHOWN IS PROHIBITED.



KEY PLAN

PROJECT NAME

HVAC REPLACEMENT

FOR

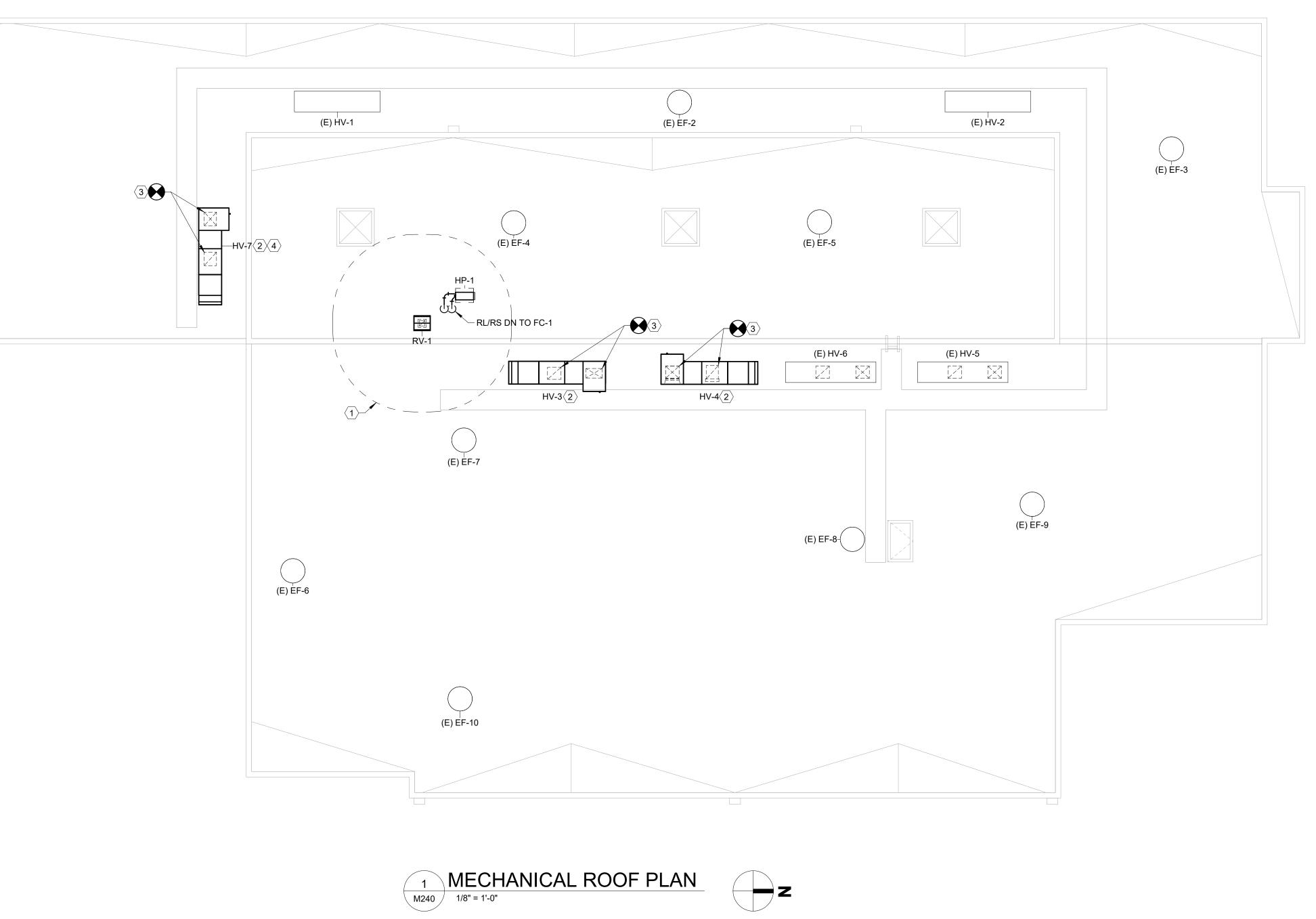
HUMBOLDT COUNTY REGIONAL FACILITY

2004 HARRISON AVENUE EUREKA, CA 95501

NO.	REVISION	S DATI
	SHEET TI	TLE
ME	CHANICA PLAN	
	ISSUED F	OR:
C	ONSTRU DOCUME	
DATE:		9/20/2024
	N BY: VED BY:	EG NW
SCALE: PROJE		1/8" = 1'-0"

 \bigcap (E) EF-1

+---



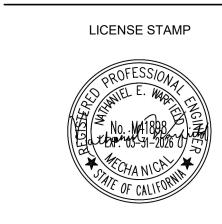
KEYED NOTES:

- MAINTAIN 10'-0" MIN CLEARANCE FROM ROOF VENTILATOR TO ANY EXHAUST DISCHARGE, VENT, OR FLUE.
- 2 CONDUCT POST-CONSTRUCTION AIR BALANCE TESTING FOR EXISTING FURNACE. SEE AIR BALANCE PROCEDURES ON M100 FOR ADDITIONAL INFORMATION.
- 3 CONNECT NEW UNIT TO EXISTING DROPS ABOVE CEILING. MODIFY DUCTWORK AS NECESSARY TO CONNECT.
- (4) MAINTAIN MINIMUM 18" CLEARANCE FROM PARAPET FOR FUTURE SECURITY FENCING.

ALL IDEAS, DESIGNS, AND PLANS REPRESENTED BY THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF FRONTIER CONSULTING ENGINEERS, INC. AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION. ANY UNAUTHORIZED REUSE OF THIS DRAWING SHEET OTHER THAN FOR THE PROJECT AND LOCATION SHOWN IS PROHIBITED.

FRONTIER CONSULTING ENGINEERS

2727 Bechelli Lane - Redding, CA 96002 Ph: (530) 232-6160 - www.frontierce.com



KEY PLAN

PROJECT NAME

HVAC REPLACEMENT

FOR

HUMBOLDT COUNTY REGIONAL FACILITY

2004 HARRISON AVENUE EUREKA, CA 95501

NO.	REVISION	S	DATE
	SHEET TI		
	SHEET H		
ME	CHANICA PLAN		DF
	ISSUED F	OR:	
С	ONSTRU DOCUME		1
DATE:		9/20)/2024
			EG
REVIEW		1/8"	NW = 1'-0"
PROJE	CT NO:		22007
	M24	10	

have setback thermostats.

+---

STATE OF CALIFORNIA Mechanical Systems CERTIFICATE OF COMPLIANCE Project Name: HUMBOLDT COUNTY REGIONAL FACILITY

CALIFORNIA ENERGY COMMISSION

NRCC-MCH-E

Report Page:	
Date Prepared:	

Generated Date/Time:

Report Version: 2022.0.000 Schema Version: rev 20220101

Report Page

FEI Exception Embedded Fan <5HP or <4.1kW Altered Fan System Altered Fan System Altered Fan System

> Generated Date/Time: Report Version: 2022.0.000

Schema Version: rev 20220101

Report Page: Date Prepared:

Date Prepared:

 06
 07
 08
 09
 10

 % Outdoor Air at Full Design Airflow
 Exemptions to Exhaust Air Heat Recovery Requirement per 140.4(q) & 170.2(c)40
 Exhaust Air Heat Recovery Requirement 170.2(c)40
 Type Of Heat Recovery Rating
 Required Recovery Rating

NR/ Common Use: Duct leakage testing shall not exceed 6% per

NA7.5.3 required for these systems?

systems?

systems?

per 140.4(q) & 170.2(c)40 170.2(c)40

ENTIFICA	CONFLOR	IANCE													NRCC-WICH-E		ENTIFICATE OF COMPT	LIANCE			
Project Na	ame: HUN	1BOLDT CC	UNTY REG	IONAL FACILITY				Rep	ort Page:						(Page 5 of 17)	Pr	roject Name: HUN	BOLDT COUNTY REGIONAL FACILITY		R	eport Page:
								Date	e Prepared:						9/20/2024					D	ate Prepared:
H. FAN S	SYSTEMS &	AIR ECO	NOMIZE	RS												F.	HVAC SYSTEM SU	JMMARY (DRY & WET SYSTEMS)			
									40.4(e), 140).4(m), 170.2	2(c)3, and 1	70.2(c)4A for	fan systems	s. Fan systems se	rving only	Dr	ry System Equipme	nt Efficiency (other than Package Ter	minal Air Conditi	oners (PTAC) and I	Package Termin
process l	oads are exe	mpt from	these req	uirements and	do not nee	d to be inclu	uded in	Table H.									01	02	03	04	05
		0		E. C. I.				Serving	Not	Fan		Cha			NA: <=33					Heati	ng Mode
System Name	ZONE AC 1	Quantit Y	1	Fan System Status	New	System al Zoning sy		Dwelling Units	Serving Dwelling Units	System Airflow (cfm)	371	Site Elevation	43	Economizer	kBtu/h cooling		Name or Item Tag	Size Category (Btu/h)	Rating Condition	Efficiency Unit	Minimum Efficiency Required per
01	02	03		04		05		06	07	08		09		10	11		Ŭ		(°F)		Tables 110.2
Fan									Allov	vance			Design								Title 20
Name						Airflow th	rough	Water	Compone	Fan				Motor	Design		ZONE AC 1	<65,000		HSPF2	7.5
or Item	Fan Type	Qty		Component		Compone	nt (%)	Gauge (w.g)	nt	Allowance (watt/cfm)	Design I	Electrical Inpu Method	it Power	Nameplate	Electrical Input		ZONE HV 3	<65,000		AFUE	0.8
Tag								(т.в)	Allowance	3		wiethou		Horsepower	Power (kW)		ZONE HV 4	<65,000		AFUE	0.8
			Base Allo	owance for system	em serving												ZONE HV 7	<65,000		AFUE	0.8
				aces <=6 floors	0	100	·		86												
SF	Supply	1		13-16 Filter ups I conditioning e		100)		52		Man	ufacturer pro	vided		0.04		. PUMPS				
			Hydroni	ic/DX cooling co pump coil	oil or heat	100	,		52							Th	his section does not	apply to this project.			
	Fan Base Ince (kW)		Exh	huast/Return/R Allow	telief/Trans vance(kW)	fer Fan Base	e			ystem ce (kW) ³		1		tem Electrical put (kW)	0.04						

_	Name or Item Tag	Size Category (Btu/h)	Rating Condition (°F)	Efficiency Unit	Efficiency Required per Tables 110.2 / Title 20	Design Efficiency	Efficiency Unit	Efficiency Required per Tables 110.2 / Title 20	Design Efficiency
	ZONE AC 1	<65,000		HSPF2	7.5	8.1	SEER2	14.3	14.6
al	ZONE HV 3	<65,000		AFUE	0.8	0.81	SEER2	13.4	14
N)	ZONE HV 4	<65,000		AFUE	0.8	0.81	SEER2	13.4	14
,	ZONE HV 7	<65,000		AFUE	0.8	0.81	SEER2	13.4	14
	G. PUMPS This section does not	apply to this project.							
		apply to this project.							

				Generated Date	/Time:		Docun	entation Software: EnergyPro						Ge
CA Building Energy Efficienc	y Standards - 202	2 Nonresidential		Report Version: Schema Version				: EnergyPro-20504-0924-0727 nerated: 2024-09-20 11:10:28	CA Building Energ	gy Efficiency Stan	dards - 2022 Nonres	idential Compli	iance	Re Sc
TATE OF CALIFORNIA									STATE OF CALIFORNIA	4				
Mechanical Systen	าร						CALIFO	RNIA ENERGY COMMISSION	Mechanical	Systems				
CERTIFICATE OF COMPLIANC	E							NRCC-MCH-E	CERTIFICATE OF CO	OMPLIANCE				
Project Name: HUMBOLI	OT COUNTY REGIO	NAL FACILITY		Report	Page:			(Page 10 of 17)	Project Name:	HUMBOLDT CO	JNTY REGIONAL FAC	ILITY		
				Date P	repared:			9/20/2024						
I. SYSTEM CONTROLS										R HEAT RECO	VERY 140.4(q), 1	70.2(c)40		
	nstrate complia	nco with mand	atory controls in 110.2 and 1	20.2 and proc	criptive control	c in 140 4(f) and (n) 170 24		or requirements in	01	02	03	04	05	—
141.0(b)2E 180.2(b)2 for a				20.2 unu presi		s III 140.4(j) unu (II), 170.2(L/4D 170.2(L/4L	or requirements in		02	03	04		+
01	02	03	04	05	06	07	08	09			Llours of			
System Name	System Zoning	Conditioned Floor Area Being Served (ft ²)	Thermostats 110.2(b) & (c) ¹ , 120.2(a) 160.3(a)2A or 141.0(b)2E & 180.2(b)2	Shut-Off Controls 120.2(e) & 160.3(a)2D	Isolation Zone Controls 120.2(g) &	Demand Response 110.12 120.2(b) & 160.3(a)2B	Supply Air Temp. Reset 140.4(f) & 170.2(c)4D	Window Interlocks per 140.4(n) & 170.2(c)4D	Fan System Name	Qty	Hours of Operation per Year	Design Supp Airflow Rat		a
		(10)	100.2(0)2	100.0(0)20	160.3(a)2F		17012(0)10		Fan Energy Ind	ex (FEI)				
ZONE AC 1	Single zone	<= 25,000 ft ²	Setback	4 Hour Timer	NA: Single Zone	EMCS	Included	NA: No operable windows		01	,			
				NA: Altered	NA: Altered					Name or I	tem Tag			F
			Setback	per	per	EMCS	NA:	NA: Alteration Project		ZONE	AC 1		Embe	Jdec
ZONE HV 3	Single zone	$1 \le 25 \ 000 \ \text{ft}^{-1}$					Alteration			ZONE	HV 3			Alte
ZONE HV 3	Single zone	<= 25,000 ft*	Setback		§141.0(b)2E					ZONL				
ZONE HV 3	Single zone	<= 25,000 ft*	JELDAUK		§141.0(b)2E NA: Altered		NA.			ZONE				Alte
ZONE HV 3 ZONE HV 4		<= 25,000 ft ²	Setback	141.0(b)2E NA: Altered per	NA: Altered per	EMCS	NA: Alteration	NA: Alteration Project			HV 4			Alte Alte
				141.0(b)2E NA: Altered per 141.0(b)2E	NA: Altered per §141.0(b)2E	EMCS	NA: Alteration	NA: Alteration Project		ZONE	HV 4			
	Single zone			141.0(b)2E NA: Altered per	NA: Altered per	EMCS		NA: Alteration Project		ZONE	HV 4			

	Generated Date/Time:	Do	cumentation Software: EnergyPro			
CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance	Report Version: 2022.0.000 Schema Version: rev 20220101		e ID: EnergyPro-20504-0924-0727 : Generated: 2024-09-20 11:10:28	CA Building Energ	gy Efficiency Standa	ards - 2022 Nonresidential Compliance
state of california Mechanical Systems		CAL	IFORNIA ENERGY COMMISSION	STATE OF CALIFORNIA		
CERTIFICATE OF COMPLIANCE		e, t	NRCC-MCH-E	CERTIFICATE OF CO		
Project Name: HUMBOLDT COUNTY REGIONAL FACILITY	Report Page:		(Page 15 of 17)			NTY REGIONAL FACILITY
	Date Prepared:		9/20/2024			
N. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION				L. DISTRIBUTIO	· · · · · · · · · · · · · · · · · · ·	K and PIPING)
N. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION Selections have been made based on information provided in previous table	c of this document. If any calaction people to be changed, pla	asa avalain why ii	Table E Additional Pemarks		ON (DUCTWORK	K and PIPING)
These documents must be provided to the building inspector during construct https://www.energy.ca.gov/title24/2019standards/2019_compliance_docu	ction and can be found online at	found online at				
	Form/Title			The answers to t	he questions bel	ow apply to the following duct system
NRCI-MCH-01-E - Must be submitted for all buildings						
O. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE				11	No	The scope of the project includes of
Selections have been made based on information provided in previous table.	s of this document. If any selection needs to be chanaed, ple	ase explain whv ii	a Table E Additional Remarks.	12	Yes	Duct system provides conditioned
These documents must be provided to the building inspector during construe	ction and can be found online at			13	Yes	The space conditioning system serv
https://www.energy.ca.gov/title24/2019standards/2019_compliance_docu	ments/Nonresidential_Documents/NRCA/			14	No	The combined surface area of the
Forn	n/Title		Systems/Spaces To Be Field	15		The scope of the project includes e
NRCA-MCH-02-A - Outdoor Air must be submitted for all newly installed HV.	AC units. Note: MCH-02-A can be performed in conjunction	with MCH-07-A	Verified RX12WMVJU9; GH 2600CFM; CU 2000CFM; CU 1600CFM;	16	No	The scope of the project includes a and diagnostic testing in accordance
Supply Fan VFD Acceptance (if applicable) since testing activities overlap. NRCA-MCH-03-A - Constant Volume Single Zone HVAC NOTE: This form doe:	a not automotically may be "Varial Constant Volume Circle	Zana LIV/AC	GH 2000CFM; GH 1600CFM; RX12WMVJU9; GH 2600CFM;	17		All Ductwork and plenums with pro
NKCA-MCH-03-A - Constant Volume Single Zone HVAC NOTE: This form doe: Systems are included in the scope, permit applicant should move this form t		Zone HVAC	GH 2000CFM; GH 1600CFM;	18		All ductwork is an extension of an
NRCA-MCH-11-A Automatic Demand Shed Controls			RX12WMVJU9; GH 2600CFM;	19		Ductwork serving individual dwelli
			GH 2000CFM; GH 1600CFM;	20		< 25 ft of new or replacement space
NRCA-MCH-18-A Energy Management Control Systems			RX12WMVJU9; GH 2600CFM;	21	R-8	Duct Insulation R-value
			GH 2000CFM; GH 1600CFM;	22		

P. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION There are no NRCV forms required for this project.

CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance	

Generated Date/Time: Report Version: 2022.0.000 Schema Version: rev 20220101

Documentation Software: EnergyPro Compliance ID: EnergyPro-20504-0924-0727 Report Generated: 2024-09-20 11:10:28

Dwelling Units: Total duct leakage of duct system shall not exceed 129 following duct systems: ZONE AC 1 or duct system to outside shall not exceed 6% per RA3.1.4 required for Duct leakage testing per CMC Section 603.10.1 required for these he project includes only duct systems serving healthcare facilities rovides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning syst ditioning system serves less than 5,000 ft² of conditioned floor area. surface area of the ducts is more than 25% of the total surface area of the entire duct system: e project includes extending an existing duct system, which is constructed, insulated or sealed with asbe he project includes an existing duct system that is documented to have been previously sealed as confirm testing in accordance with procedures in the Reference Nonresidential Appendix NA2. nd plenums with pressure class ratings shall be constructed to Seal Class A s an extension of an existing duct system ng individual dwelling unit r replacement space conditioning ducts installed R-value 23 M. COOLING TOWERS This section does not apply to this project.

Generated Date/Time: CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance Report Version: 2022.0.000 Schema Version: rev 20220101

CALIFORNIA ENERGY COMMISSION	
NRCC-MCH-E	
(Page 4 of 17)	
9/20/2024	

STATE OF CALIFORNIA

Mechanical Systems

CERTIFICATE OF COMPLIANCE

Project Name: HUMBOLDT COUNTY REGIONAL FACILITY

Minimu Efficien Required Tables 110 Title 20	cy per 0.2 /	06 Design Efficiency	07 Efficiency Unit	08 Cooling Mode Minimum Efficiency Required per	09 Design Efficiency
Efficien Required Tables 110 Title 20	cy per 0.2 /	Design Efficiency	Efficiency Unit	Minimum Efficiency Required per	Design Efficiency
Efficien Required Tables 110 Title 20	cy per 0.2 /	Design Efficiency	Efficiency Unit	Efficiency Required per	Design Efficiency
	0			Tables 110.2 / Title 20	
7.5		8.1	SEER2	14.3	14.6
0.8		0.81	SEER2	13.4	14
0.8		0.81	SEER2	13.4	14
0.8		0.81	SEER2	13.4	14

F. HVAC SYSTEN	/I SUMMARY (DRY & WET	SYSTEMS)								
Dry System Equi	oment Sizing (includes air co	nditioners, condensers, heat pumps, VR	F, furnaces and u	nit heaters a	and DOAS s	ystems)				
01	02	03	04	05	06	07	08	09	10	11
							r Mechanica , 170.2(c)1 {		(kBtu/h)	
	Equipment Category per		Smallest Size	Hea	ating Outpu	t ^{2,3}	Cooling (Output ^{2,3}	Load Calc	ulations ^{3,4}
Name or Item Tag	Tables 110.2, 140.4(a)2 and 170.2(c)3aii	Equipment Type per Tables 110.2 and Title 20	Available ¹ 140.4(a) and 170.2(c)1	Per Design (kBtu/h)	Rated (kBtu/h)	Supp. Heating Output (kBtu/h)	Sensible Per Design (kBtu/h)	Rated (kBtu/h)	Total Heating Load (kBtu/h)	Total Sensible Cooling Load (kBtu/h)
ZONE AC 1	Unitary Heat Pumps	Air-cooled, split (1phase)	Yes	9.44	13.6	0	9.1	8	0.35	1.98
ZONE HV 3	Furnace + AC	AC, air cooled, single pkg + warm-air central furnace, gas-fired	NA: Altered per 141.0(b)2E and 180.2(b)2	121.5	121.5	0	0	0	6.11	19.8
ZONE HV 4	Furnace + AC	AC, air cooled, single pkg + warm-air central furnace, gas-fired	NA: Altered per 141.0(b)2E and 180.2(b)2	121.5	121.5	0	0	0	11.55	20.72
ZONE HV 7	Furnace + AC	AC, air cooled, single pkg + warm-air central furnace, gas-fired	NA: Altered per 141.0(b)2E and 180.2(b)2	81	81	0	0	0	6.76	9.81
40.4(a) and 170	.2(c)1. Healthcare facilities ar	size, within the available options of the a re excepted. apacity on the equipment schedule. Sens.		-		5	5	d cooling lo	ads of the b	uilding pe

³ If equipment is heating only, leave cooling output and load blank. If equipment is cooling only, leave heating output and load blank.

⁴ Authority Having Jurisdiction may ask for load calculations used for compliance per 140.4(b) and 170.2(c).

Report Page: Date Prepared:

01		02		0.2		04		05
01		02		03		04		05
System Summary 110.1, 110.2, 140.4, 170.2(c)	AND	Pumps 140.4(k), 170.2(c)4I	AND	Fans/ Economizers 140.4(c), 140.4(e), 170.2(c)	AND	System Controls 110.2, 120.2, 140.4(f), 170.2(c)	AND	Ventilati 120.1, 16
(See Table F)		(See Table G)		(See Table H)		(See Table I)		(See Tabl
Yes	AND		AND	Yes	AND	Yes	AND	Yes
				Mandatory	Measu	ures Complian	ce (See	Table Q f
This table is t	ино-јт							nto ontoro
E. ADDITION		MARKS						ata entered
		MARKS		permit applica				
This table inc	ludes re	MARKS emarks made	by the _l		nt to th			
This table inc F. HVAC SYS	ludes ro TEM S	MARKS emarks made	by the p	permit applica	nt to th			
This table inc F. HVAC SYS	ludes ro TEM S	MARKS emarks made i UMMARY (D	by the p	permit applica	nt to th	ne Authority H		
This table inc F. HVAC SYS Space Condit	ludes ro TEM S ioning	MARKS emarks made i UMMARY (D System Inforn	by the p	permit applica WET SYSTEM	nt to th	ne Authority H	aving J D3	urisdiction
This table inc F. HVAC SYS Space Condit Syste	ludes ro TEM S ioning 01	MARKS emarks made i UMMARY (D System Inform	by the p	permit applica WET SYSTEM: 02	nt to th	ne Authority H	aving J D3	urisdiction
This table inc F. HVAC SYS Space Condit Syste ZOI	TEM S ioning 01 m Nam	MARKS emarks made i UMMARY (D System Inform	by the p	oermit applica NET SYSTEM 02 Quantity	nt to th	ne Authority H System Singl	aving J D3 1 Servin	urisdiction

STATE OF CALIFORNIA

CALIFORNIA ENERGY COMMISSION

NRCC-MCH-E

(Page 3 of 17)

Mechanical Systems

CERTIFICATE OF COMPLIANCE

C. COMPLIANCE RESULTS

Project Name: HUMBOLDT COUNTY REGIONAL FACILITY

			ZONE HV 3 1 Single zon ZONE HV 4 1 Single zon ZONE HV 7 1 Single zon	e Alteration				
Documentation Software: EnergyPro	Generated Date/Time:	Documentation Software: EnergyPro		Generated Date/Time:	Documentation Software: EnergyPro		Generated Date/Time:	Documentation Software: Ener
Compliance ID: EnergyPro-20504-0924-0727 Report Generated: 2024-09-20 11:10:28	CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance Report Version: 2022.0.000 Schema Version: rev 20220101	Compliance ID: EnergyPro-20504-0924-0727 Report Generated: 2024-09-20 11:10:28	CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance	Report Version: 2022.0.000 Schema Version: rev 20220101	Compliance ID: EnergyPro-20504-0924-0727 Report Generated: 2024-09-20 11:10:28	CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance	Report Version: 2022.0.000 Schema Version: rev 20220101	Compliance ID: EnergyPro-20504-0924 Report Generated: 2024-09-20 11:
CALIFORNIA ENERGY COMMISSION	state of california Mechanical Systems	CALIFORNIA ENERGY COMMISSION	state of California Mechanical Systems		CALIFORNIA ENERGY COMMISSION	state of california Mechanical Systems		CALIFORNIA ENERGY COMM
NRCC-MCH-E (Page 9 of 17)	CERTIFICATE OF COMPLIANCE Project Name: HUMBOLDT COUNTY REGIONAL FACILITY REGIONAL F	NRCC-MCH-E (Page 8 of 17)	CERTIFICATE OF COMPLIANCE Project Name: HUMBOLDT COUNTY REGIONAL FACILITY	Report Page:	NRCC-MCH-E (Page 7 of 17)	CERTIFICATE OF COMPLIANCE Project Name: HUMBOLDT COUNTY REGIONAL FACILITY	Report Page:	NRCC- (Page 6
9/20/2024	Date Prepared:	9/20/2024		Date Prepared:	9/20/2024		Date Prepared:	9/20
	H. FAN SYSTEMS & AIR ECONOMIZERS		H. FAN SYSTEMS & AIR ECONOMIZERS			H. FAN SYSTEMS & AIR ECONOMIZERS		
09 10 11	Serving Not Fan	NA: Altered packaged		her Serving Serving System 2,000	Site A2 Formation Packaged		Serving Serving Serving System	A coo Site da Ferrerier Pack
Type Of Heat Required Recovery Recovery Ratio	System Name ZONE HV 7 Quantit y 1 Fan System Status Alteration System Zoning all other systems Gerving Dwelling Units Serving Dwelling Units System Airflow (cfm) 1,600 Site Elevat 01 02 03 04 05 06 07 08 09	on 43 Economizer AC or HP <54 kBtu/h	System Name ZONE HV 4 Quantit y 1 Fan System Status Alteration System Zoning all o system 01 02 03 04 05		Site 43 Economizer Packaged AC or HP <54 kBtu/h 09 10 11	Name Zolive HV 5 y 1 Status Alteration Zoning	all other Serving System bystems Dwelling Dwelling Units Units Dwelling 05 06 07	2,600 Elevation 43 Economizer AC c 09 10 11
Bypass	Fan Water Fan	Design Design	Fan	Allowance Ean	Design Design	Fan	Allowance	Design
03	Name or Item TagFan TypeQtyComponentAirflow through Component (%)Compone (%)Compone Gauge (w.g)Compone nt Allowance 3Design Electrica Meth	Input Power Namenlate Electrical	Name or Item Fan Type Qty Component Airflow throu Component Tag Tag Tag Airflow throu Airflow throu	%) Gauge Compone Allowance Design Elec	ctrical Input Power Method Motor Electrical Horsepower Power (kW)		through Componed	Design Electrical Input Power Method Horsepower Power
FEI	Base Allowance for system serving spaces <= 6 floors away		Base Allowance for system serving spaces <=6 floors away 100	464		spaces <=6 floors away	100 603	
	SF Supply 1 MERV 13-16 Filter upstream of thermal conditioning equipment 100 222 Gas heat 100 93 Manufacture	provided 0.93	SF Supply 1 MERV 13-16 Filter upstream of thermal conditioning equipment 100 Gas heat 100	278 Manufa	icturer provided 1.11	SE Supply 1	100 361 100 151	Manufacturer provided 1.
	Hydronic/DX cooling coil or heat 100 222		Gas heat 100 Hydronic/DX cooling coil or heat 100 pump coil	278		Hydronic/DX cooling coil or heat	100 361	
	Supply Fan Base Exhuast/Return/Relief/Transfer Fan Base Fan System	Fan System Electrical	Supply Fan System 100	278 Fan System	Fan System Electrical		100 361 Base Fan System	Fan System Electrical
	Allowance (kW) Allowance (kW) ³ 1.13	Output (kW) 0.93	Supply Fan Base Exhuast/Return/Relief/Transfer Fan Base Allowance (kW) Allowance(kW)	Allowance (kW) ³	Output (kW) 1.11	Allowance (kW) Allowance (kW)	Allowance (kW) ³	1.84 Output (kW) 1.
	¹ FOOTNOTES: Fans serving spaces with design background noise goals below NC35 ² Low-turndown single-zone VAV fan system must be capable of and configured to reduce airflow to 50 percent of design airflow and use no more than 30 percent of the design wattage at that airflow. No more than 10 percent of the							
	design load served by the equipment shall have fixed loads. ³ Fan system allowance includes fan system base allowance.							
	⁴ Filter pressure loss can only be counted once per fan system. ⁵ Complex Fan System means a fan system that combines a single cabinet fan system with other supply fans, exhaust fans, or both.							
	⁶ Computer room economizers must meet requirements of 140.9(a) and will be documented on the NRCC-PRC-E document.							
Desumentation Software, Freeze, Dra	Converted Date (Time)	Decumentation Software, EnergyDre		Concepted Data (Timo)	Desumentation Software: EnergyDre		Concepted Data /Times	Desumentation Softwares Fre
Documentation Software: EnergyPro Compliance ID: EnergyPro-20504-0924-0727	Generated Date/Time: CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance Report Version: 2022.0.000	Documentation Software: EnergyPro Compliance ID: EnergyPro-20504-0924-0727	CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance	Generated Date/Time: Report Version: 2022.0.000	Documentation Software: EnergyPro Compliance ID: EnergyPro-20504-0924-0727	CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance	Generated Date/Time: Report Version: 2022.0.000	Documentation Software: Ener Compliance ID: EnergyPro-20504-0924
Report Generated: 2024-09-20 11:10:28	Schema Version: rev 20220101	Report Generated: 2024-09-20 11:10:28		Schema Version: rev 20220101	Report Generated: 2024-09-20 11:10:28		Schema Version: rev 20220101	Report Generated: 2024-09-20 11
CALIFORNIA ENERGY COMMISSION	state of california Mechanical Systems	CALIFORNIA ENERGY COMMISSION	state of california Mechanical Systems		CALIFORNIA ENERGY COMMISSION	STATE OF CALIFORNIA Mechanical Systems		CALIFORNIA ENERGY COMM
NRCC-MCH-E (Page 14 of 17)	CERTIFICATE OF COMPLIANCE Project Name: HUMBOLDT COUNTY REGIONAL FACILITY Regional Facility Report Page:	NRCC-MCH-E (Page 13 of 17)	CERTIFICATE OF COMPLIANCE Project Name: HUMBOLDT COUNTY REGIONAL FACILITY	Report Page:	NRCC-MCH-E (Page 12 of 17)	CERTIFICATE OF COMPLIANCE Project Name: HUMBOLDT COUNTY REGIONAL FACILITY	Report Page:	NRCC- (Page 11
9/20/2024	Date Prepared:	9/20/2024		Date Prepared:	9/20/2024		Date Prepared:	9/2
	J. VENTILATION AND INDOOR AIR QUALITY					J. VENTILATION AND INDOOR AIR QUALITY		
hall not exceed 6% per No	Space Name Mechanical Ventilation Required per 120.1(c)3 ³ & 160.2(c)3 Exh. Vent per 120.1(c)4 & 160.2(c)4 Space Name Conditioned # of Shower # of Shower	DCV or Sensor Controls per 120.1(d)3, 120.1(d)5, and 120.1(e)3 ⁶ 160.2(c)5D	Mechanical Ventilation Required per 120.1(c)3 ³ & 1 Space Name Conditioned # of Shower	0.2(c)3 Exh. Vent per 120.1(c)4 & 160.2(c)4	DCV or Sensor Controls per 120.1(d)3, 120.1(d)5, and 120.1(e)3 ⁶ 160.2(c)5D	This table is used to demonstrate compliance with mandatory ventilation d:t24refnolink/]160.2, 160.3(a)3D, 170.2(a)4N, 170.2(a)4O for high-rise re application need to be documented in this table. In lieu of this table, the re	sidential occupancies. For alterations, only ventilat	ation systems being altered within the scope of the pern
stem shall not exceed 12% % per RA3.1.4 required for No	or Item Tag Occupancy Type ⁴ Floor Area heads/ (ft ²) # of toilets # of people ⁵ Required Min OA CFM Required Min CFM Provided per Design CFM	160.2(c)5E 160.2(c)5D	or Item Tag Occupancy Type ⁴ (ft ²) toilets	# of people ⁵ Min OA CFM Min CFM CFM CFM	160.2(c)5E 160.2(c)5D	in a spreadsheet. 01 Check the box if the project is showing ventil	ation calculations on the plans, or attaching the ca	alculations instead of completing this table.
.10.1 required for these Yes	33 - Media Center 1254 188.1 0 0 -	DCV NA: Not required per §120.1(d)3	55 - DAY Media Center 2624	393.6 0 0	DCV NA: Not required per	02 Check this box if the project included Nonres	idential, Hotel/Motel Spaces or Multifamily Comm	non Use Spaces
	RECREATION	Occ Sensor NA: Not required space type	ROOM A		Occ Sensor NA: Not required space type	03 Check the box if the project is using natural v Nonresidential and Hotel/ Motel Multifamily Common Use Ventilation S		paces to meet required ventilation rates per 120.1(c)2.
bace-conditioning system.	17 Total System Required Min OA CFM 188 18 Ventilation for this Sy ¹ FOOTNOTES: System CFM should include both mechanical and natural ventilation for the zone/system		17 Total System Required Min OA CFM 04 05	394 18 Ventilation for th 06	this System Complies? Yes 07	04 05		07 Air Filtration per 120.1(c) 141.0(b)2 a
d or sealed with asbestos.	² Air filtration requirements apply to the following three system types per 120.1(c)1A: space conditioning systems utilizing ducts to supply air systems providing outside air to occupiable space; supply side of balanced ventilation systems including heat recovery and energy recovery v occupiable space.		System Name ZONE HV 4 System Design OA CFM Airflow ¹	52 System Design 0 Transfer Air CFM	Air Filtration per 120.1(c) 141.0(b)2 and 160.2(c)21 ²	System Name ZONE AC 1 System Design OA Airflow ¹	CFM 0 System Design Transfer Air CFM	0 160.2(c)21 ² Provided
usly sealed as confirmed through field verification A2.	occupiable space. ³ Uniform Mechanical Code may have more stringent ventilation requirements; the most stringent code requirement takes precedence. ⁴ Constant of the second		08 09 10 11	12 13 14 15	Provided 16	08 09 10 1 Mechanical Ventilation Required per 120.1(c)	- Exh. Vent per 120	15 16 20.1(c)4 &
	⁴ See Standards Tables 120.1-A and 120.1-B. ⁵ For lecture halls with fixed seating, the expected number of occupants shall be determined in accordance with the California Building Code.		Mechanical Ventilation Required per 120.1(c)3 ³ & 1 Space Name	100.2(0)4	DCV or Sensor Controls per 120.1(d)3,	Space Name or Item Tag	nower # of Required Required Provided	120.1(d)5, and 120.1(e)3 ⁶ 160.2(c)5
	⁶ 120.2(e)3 requires systems serving rooms that are required by 130.1(c) to have lighting occupancy sensing controls to also have occupancy Examples of spaces which require lighting occupancy sensors include offices 250ft ² or smaller, multipurpose rooms less than 1,000 ft ² , classr and open areas in warehouses, library book stack aisles, corridors, stairwells, parking garages, and loading and unloading zones, unless exce	ooms, conference rooms, restrooms, aisles	or Item Tag Occupancy Type ⁴ (ft ²) Conditioned # of Shower Floor Area heads/ (ft ²)	# of people ⁵ Required Arequired Min OA CFM Min CFM CFM CFM	n 120.1(d)5, and 120.1(e)3 ⁶ 160.2(c)5D 160.2(c)5E 160.2(c)5D	Occupancy Type ⁴ Floor Area hea (ft ²) toil	ds/ neople ⁵ Min OA Min CEM C	CFM NA: Not require
	K. TERMINAL BOX CONTROLS		15 - VOCATIONAL Media Center 1760	264 0 0	DCV NA: Not required per <u>§120.1(d)3</u> NA: Not required	24 - CONTROL Office space 233	34.9 0	0 Occ Sensor NA: Not requi
	This section does not apply to this project.		TRAINING 17 Total System Required Min OA CFM	264 18 Ventilation for ti	Occ Sensor NA: Not required space type this System Complies? Yes	17 Total System Required Min OA CFM		tilation for this System Complies? Yes
	L. DISTRIBUTION (DUCTWORK and PIPING) This table is used to show compliance with mandatory pipe insulation requirements found in 120.3 and mandatory requirements found in 12	0.4(a) for duct sealing.	04 05	06	07	04 05 System Design OA		07 Air Filtration per 120.1(c) 141.0(b)2 a
	01 Insulation shall be protected from damage, including that due to sunlight, moisture, equipment mainter weather shall be installed with a cover suitable for outdoor service. Insulation covering chilled water pipeling in the installed with a cover suitable for outdoor service. Insulation covering chilled water pipeling in the installed with a cover suitable for outdoor service. Insulation covering chilled water pipeling in the installed with a cover suitable for outdoor service. Insulation covering chilled water pipeling in the installed with a cover suitable for outdoor service. Insulation covering chilled water pipeling in the installed with a cover suitable for outdoor service.	ance, and wind. Insulation exposed to	System Name ZONE HV 7 System Design OA CFM Airflow ¹	0 System Design Transfer Air CFM 0	Air Filtration per 120.1(c) 141.0(b)2 and 160.2(c)21 ²	System Name ZONE HV 3 Airflow ¹	0 Transfer Air CFM	0 160.2(c)21 ² Provided
	outside the conditioned space shall have a Class I or Class II vapor retarder. All penetrations and joints o		08 09 10 11	12 13 14 15	Provided 16	08 09 10 1	1 12 13 14	15 16
Documentation Software: EnergyPro	Generated Date/Time:	Documentation Software: EnergyPro		Generated Date/Time:	Documentation Software: EnergyPro		Generated Date/Time:	Documentation Software: Ener
Compliance ID: EnergyBro 20504 0024 0727	CA Building Energy Efficiency Standards 2022 Neurosidential Compliance Penert Version: 2022 0.000	Compliance ID: EnergyDre 20504 0024 0727	CA Building Energy Efficiency Standards 2022 Neurosidential Compliance	Benert Version, 2022 0 000	Compliance ID: EnergyDre 20504 0024 0727	CA Building Energy Efficiency Standards 2022 Neurosidential Compliance	Benert Version, 2022 0 000	Compliance ID: EnergyBro 20504 002/

	RECREATION						Occ Sensor	NA:
oning system.	17	Total System Required Min OA CFM		18	3 18	Ventilation for this	System Complies?	
	¹ FOOTNOTES:	System CFM should include both mec	hanical and natural ventilati	on for the zone/sy	stem			
with asbestos. s confirmed through field verification	systems providi occupiable spac	equirements apply to the following th ng outside air to occupiable space; si ze. nanical Code may have more stringer	upply side of balanced ventile	ation systems inclu	iding heat rec	overy and energy recovery		
	⁴ See Standards	Tables 120.1-A and 120.1-B.						
	⁵ For lecture ha	lls with fixed seating, the expected n	umber of occupants shall be	determined in acc	ordance with	the California Building Cod	le.	
	Examples of spe and open areas	uires systems serving rooms that are aces which require lighting occupanc in warehouses, library book stack ai BOX CONTROLS	y sensors include offices 250j	ft ² or smaller, mult	tipurpose roor	ns less than 1,000 ft ² , clas	srooms, conference ro	-
	This section do	es not apply to this project.						
		ON (DUCTWORK and PIPING)						
	This table is use	ed to show compliance with mandate		,				-
	01	weather shall be	be protected from damage, i e installed with a cover suita ditioned space shall have a C	ble for outdoor se	rvice. Insulation	on covering chilled water p	piping and refrigerant s	suction pi
Documentation Software: EnergyPro				Generated Date	e/Time:		Document	tation Soft

Compliance ID: EnergyPro-20504-0924-0727 Report Generated: 2024-09-20 11:10:28

CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance

Report Version: 2022.0.000 Schema Version: rev 20220101 Compliance ID: EnergyPro-20504-0924-0727 Report Generated: 2024-09-20 11:10:28

state of california Mechanical Systems CERTIFICATE OF COMPLIANCE Project Name: HUMBOLDT COUNTY REGION Project Address: _____

CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance

CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance



STATE OF CALIFORNIA Mechanical Systems CALIFORNIA ENERGY COMMISSION CERTIFICATE OF COMPLIANCE

												NRCC-WICH-E	CENTIFICA	ALC OF COM	IFLIANCE								NI IN
ITY REG	IONAL FACILITY				Rep	ort Page	:					(Page 2 of 17)					ical syste	ms that are within the	scope	of the permit application	n and are	demonstrating	compliance using the pres
					Date	e Prepar	red:					9/20/2024	·		0.4, or 141.0(b)2 for alte								
															UMBOLDT COUNTY REGION	IAL FACILITY			eport	-			(Pa
													Project Ad	ddress:			2	004 HARRISON STREET	ate Pr	epared:			
data i	nut into the co	mnlian	ce document i	s com	nliant with me	chanica	al requirements	This	table is not ed	litahle h	by the user. If this to	able says "DOES	A. GENE	RAL INFO	ORMATION								
							t compliant for			itubic b	y the user. If this t		01 Proje	ect Locatio	on (city)		EUI	REKA	04	Total Conditioned Floor	Area		5871
	03		04		05		06		07		08	09	02 Clima					1		Total Unconditioned Floo			0
1	Fans/	1	System			1				1			03 Occu	upancy Typ	oes Within Project:				06	# of Stories (Habitable A	bove Grad	le)	1
AND	Economizers	AND	Controls 110.2, 120.2,	AND	Ventilation	AND	Terminal Box Controls	AND	Distribution 120.3,	AND	Cooling Towers		Classro	oom • Off	fice								
	140.4(c), 140.4(e),		140.4(f),		120.1, 160.2		140.4(d),		140.4(I),		110.2(e)2	Compliance Results											
	170.2(c)		170.2(c)				170.2(c)4B		160.2, 160.3				B. PROJE	ECT SCOP	PE								
	(See Table H)		(See Table I)		(See Table J)	-	(See Table K)		(See Table L)		(See Table M)						e within t	he scope of the permit	appli	cation and are demonstr	ating corr	pliance using th	ne prescriptive path outlin
AND	Yes	AND	Yes	AND	Yes	AND		AND	Yes	AND		COMPLIES	140.4, 170	70.2(b) or 1	141.0(b)2 and 180.2(b)2	for alterations.							
	Mandatory	/ Measu	res Complian	ce (Se	e Table Q for D	Details)				COMP	LIES				01			02					03
							•								Air System(s)			Wet System C	ompo	nents			tem Components
															g Air System			Water Economizer				Air Economiz	
			1					,							g Air System			Pumps				Electric Resis	tance Heat
table (comments beca	iuse of s	selections maa	le or d	ata entered in	tables	throughout the	e form.							Mechanical Controls			System Piping			\boxtimes	Fan Systems	
														Mechar or new	nical Controls (existing to)	o remain, altered		Cooling Towers			\boxtimes	Ductwork (ex	isting to remain, altered o
h A h					1													Chillers			\boxtimes	Ventilation	
by the	permit applica	int to tr	e Authority Ho	aving	lurisalction.													Boilers				Zonal System	s/ Terminal Boxes
DRY &	WET SYSTEM	IS)																					
natior	1																						
	02		()3			04		()5		06											
	Quantity		System	Servi	ng	Sys	stem Status		Space	e Type	Utilizin	ng Recovered Heat											
	1		Single	e zone	2	Ne	w/ Addition																
	1		Single	e zone	;	ļ	Alteration																
	1		Single	e zone		Å	Alteration																
	1		Single	e zone		ļ	Alteration																
					Generated Da	ate/Tim	o.				Documentation	n Software: EnergyPro						Generated	Date	Time			Documentation Software:
					Scherated De						Documentation	Southare. Energy 10						Generated	Juic				Socamentation Software.
rds - 20)22 Nonresident	ial Comp	liance		Report Versic Schema Versi					Co		Pro-20504-0924-0727 : 2024-09-20 11:10:28	CA Buildir	ing Energy E	Efficiency Standards - 2022	Nonresidential Comp	liance			2022.0.000 rev 20220101			liance ID: EnergyPro-20504-0 eport Generated: 2024-09-20
													STATE OF CA	ALIFORNIA									

				Dat	e Prepared:						9/20/2024
n	Alteration		all other systems	Serving Dwelling Units	Not Serving Dwelling Units	Fan System Airflow (cfm)	2,000	Site Elevation	43	Economizer	NA: Altered packaged AC or HP <54 kBtu/h
		0	5	06	07	08		09		10	11
					Allow	/ance			Design		
ent			through nent (%)	Water Gauge (w.g)	Compone nt Allowance	Fan Allowance (watt/cfm) ³	0	lectrical Inpu Method	ıt Power	Motor Nameplate Horsepower	Design Electrical Input Power (kW)
	em serving away	10	00		464						
	stream of equipment	10	00		278			6			
at		10	00		116		iviant	afacturer pro	vided		1.11
ng c nil	oil or heat	10	00		278						

H. FAN S	SYSTEMS &	AIR ECO	NOMIZE	RS											
System Name	ZONE HV 3	Quantit Y	1	Fan System Status	Alteration		all other systems	Serving Dwelling Units	Not Serving Dwelling Units	Fan System Airflow (cfm)	2,600	Site Elevation	43	Economizer	NA: Altere packaged AC or HP <54 kBtu/
01	02	03		04		C	5	06	07	08		09		10	11
Fan									Allow	vance			Design		
Name or Item Tag	Fan Type	Qty		Component		Airflow Compoi	through nent (%)	Water Gauge (w.g)		Fan Allowance (watt/cfm) ³		lectrical Inpu Method	ıt Power	Motor Nameplate Horsepower	Design Electrical Input Power (kW
				owance for syst aces <=6 floors		1	00		603						
				13-16 Filter up I conditioning e		1	00		361			<i>.</i> .			
SF	Supply	1		Gas heat		1	00		151		Manu	ufacturer pro	vided		1.65
			Hydron	ic/DX cooling c pump coil	oil or heat	1	00		361						
			9	Supply Fan Syst	em	1	00		361						
	/ Fan Base ance (kW)		Ex	huast/Return/F Allov	Relief/Transt wance(kW)	fer Fan Ba	ise			ystem ce (kW) ³	1.	84		m Electrical ut (kW)	1.65

	NRCC-MCH
ONAL FACILITY	Report Page: (Page 17 of 1
2004 HARRISON STREET	Date Prepared: 9/20/202
•	
RATION STATEMENT	
liance documentation is accurate and complete	e. M
eld D	e. Documentation Author Signature: Nathaniel Inlight
s	ignature Date:
2	2024-09-20
c	EA/ HERS Certification Identification (if applicable):
P	hone: (530) 232-6160
specifications, materials, components, and manufactured devices I fornia Code of Regulations. design features identified on this Certificate of Compliance are con he enforcement agency for approval with this building permit appl opy of this Certificate of Compliance shall be made available with 1 eted signed copy of this Certificate of Compliance is required to be	the building permit(s) issued for the building, and made available to the enforcement agency for all applicable included with the documentation the builder provides to the building owner at occupancy.
	tesponsible Designer Signature: Narturial Winfield
	vate Signed: 2024-09-20
-	icense: ∕/41898
-	^{hone:} 530) 232-6160

Report Version: 2022.0.000

Generated Date/Time:

Report Version: 2022.0.000

Schema Version: rev 20220101

Schema Version: rev 20220101

CA Bu	ilding Energy Efficiend	y Standards - 2022	Nonresidential Corr	npliance

state of california Mechanical Systems CERTIFICATE OF COMPLIANCE

Project Name: HUMBOLDT COUNTY REGIONAL FACILITY	Report Page:	
	Date Prepared:	
Q. MANDATORY MEASURES DOCUMENTATION LOCATION		
This table is used to indicate where mandatory measures are documen	nted in the plan set or construction documentation.	
01		02
Compliance with Mandatory Measures documented through MCH	Yes	Plan sheet or construction doc
Mandatory Measures Note Block	les	M-Sheets

Report Version: 2022.0.000

Schema Version: rev 20220101

Compliance ID: EnergyPro-20504-0924-0727 Report Generated: 2024-09-20 11:10:28

Documentation Software: EnergyPro

Compliance ID: EnergyPro-20504-0924-0727

Report Generated: 2024-09-20 11:10:28

CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance

Report Version: 2022.0.000 Schema Version: rev 20220101

Generated Date/Time:

M-Sheets

(d)5, and 120.1(e)3⁶ 160.2(c)5D 160.2(c)5E 160.2(c)5D

 DCV
 NA: Not required per §120.1(d)3

 Occ Sensor
 NA: Not required space type

 Complies?
 Yes

 07

160.2(c)21² Provided 16 r Sensor Controls per 120.1(d)3,

pleting this table. ilation rates per 120.1(c)2. 07 ation per 120.1(c) 141.0(b)2 and

Documentation Software: EnergyPro pliance ID: EnergyPro-20504-0924-0727 Report Generated: 2024-09-20 11:10:28

NRCC-MCH-E (Page 2 of 17)

		NRCC-MCH-I
scope of the permit app	lication and are demonstrating	g compliance using the prescriptive
Report Page:		(Page 1 of 17
Date Prepared:		9/20/2024
04 Total Conditioned	Floor Area	5871
05 Total Uncondition		0
06 # of Stories (Habit		1
application and are der	nonstrating compliance using	the prescriptive path outlined in
approactor and are der		
		03
	Dry S	03 ystem Components
	Dry Sy Air Econom	ystem Components
	Air Econom	ystem Components
	Air Econom	ystem Components izer istance Heat
	Air Econom	ystem Components izer istance Heat
omponents	Air Econom	ystem Components izer istance Heat s

Documentation Software: EnergyPro npliance ID: EnergyPro-20504-0924-0727 Report Generated: 2024-09-20 11:10:28

NERGY COMMISSION
NRCC-MCH-E
(Page 6 of 17)
9/20/2024

ackaged C or HP 4 kBtu/h 11
Design lectrical Input wer (kW)
1.65
1.65

CALIFORNIA ENERGY COMMISSION NRCC-MCH-E (Page 11 of 17) 9/20/2024

and hotel/motel and d within the scope of the permit r the calculations can be presented

tration per 120.1(c) 141.0(b)2 and

Documentation Software: EnergyPro Compliance ID: EnergyPro-20504-0924-0727 Report Generated: 2024-09-20 11:10:28

> CALIFORNIA ENERGY COMMISSION NRCC-MCH-E (Page 16 of 17) 9/20/2024

> > document location

Documentation Software: EnergyPro Compliance ID: EnergyPro-20504-0924-0727 Report Generated: 2024-09-20 11:10:28 FRONTIER CONSULTING ENGINEERS 2727 Bechelli Lane - Redding, CA 96002 Ph: (530) 232-6160 - www.frontierce.com

ALL IDEAS, DESIGNS, AND PLANS REPRESENTED BY THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF FRONTIER CONSULTING ENGINEERS, INC. AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION. ANY UNAUTHORIZED REUSE OF THIS DRAWING SHEET OTHER THAN FOR THE PROJECT AND LOCATION SHOWN IS PROMUTED

LICENSE STAMP

KEY PLAN

PROJECT NAME

HVAC REPLACEMENT

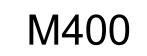
FOR

HUMBOLDT COUNTY **REGIONAL FACILITY**

2004 HARRISON AVENUE EUREKA, CA 95501

NO.	REVISIONS	DATE
	SHEET TITLE	
TITI F	24 COMPLI	ANCE

ISSUED FOR: CONSTRUCTION DOCUMENTS DATE: 9/20/2024 DRAWN BY: EG REVIEWED BY: NW SCALE: PROJECT NO: 22007

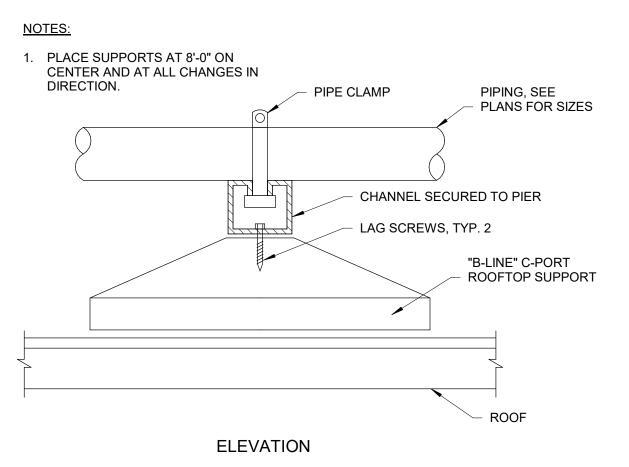


NOTES:

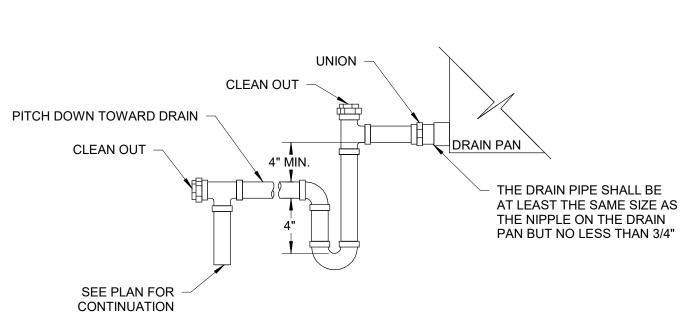
GAS SHUTOFF COCK

PIPING MATERIALS SCHEDULE				JLE	
	Service	Location	Size	Material	Notes
	GAS	EXTERIOR, ABOVE GRADE	ALL	BLACK STEEL THREADED	2" AND SMALLER - THREADED CONNE LARGER THAN 2" - WELDED CONNEC
	COND. DRAIN	ALL	ALL	TYPE M - HARD TEMPER COPPER SCHEDULE 40 PVC DWV IS TO BE USED ON FUEL BURNING APPLIANCES ONLY	SLOPED AT 1/4" PER FOOT

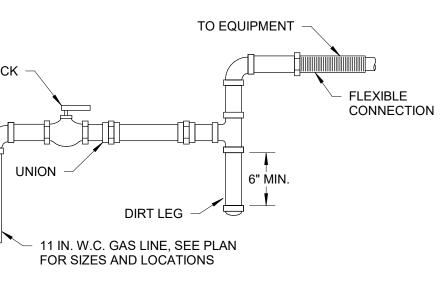




1 PIPE SUPPORT ON ROOF DETAIL P100 NOT TO SCALE

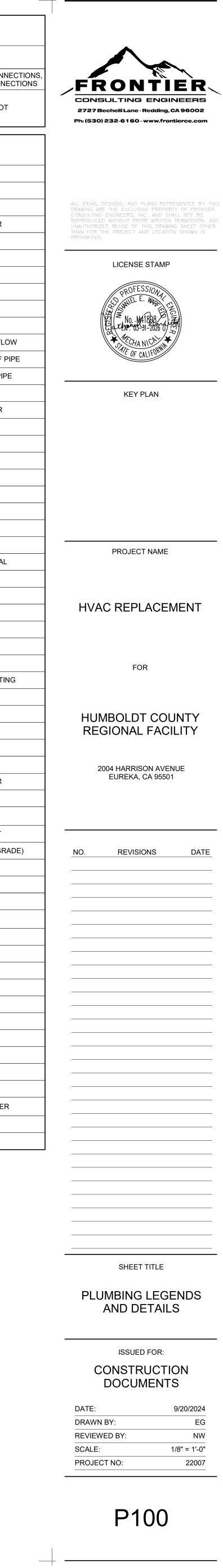


2 HVAC CONDENSATE DRAIN DETAIL P100 NOT TO SCALE



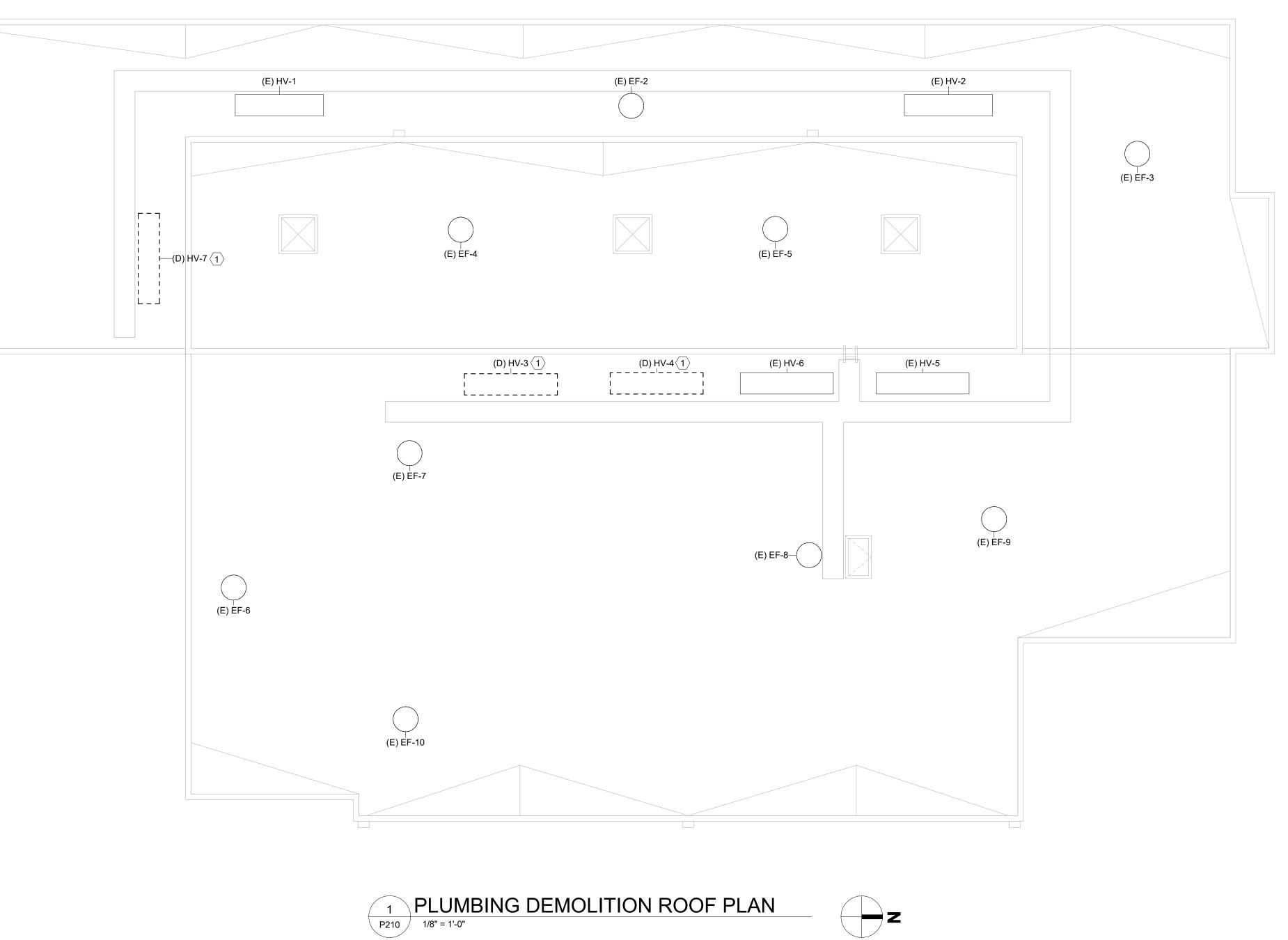
3 GAS CONNECTION DETAIL P100 NOT TO SCALE

I		
SYMBOLS	ABBREVIATIONS	
	ABC	ABOVE CEILING
	BFP	BACKFLOW PREVENTER
φ		BALL VALVE
	BG	BELOW GRADE
	BS	BELOW SLAB
		CHECK VALVE
	CW	COLD WATER SUPPLY
	CD	CONDENSATE DRAIN
	CDO	CONDENSATE DRAIN OVERFLOW
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		CONNECTION TO BOTTOM OF PIPE
		CONNECTION TO TOP OF PIPE
	D	DEMO
		DOMESTIC COLD WATER
		DOMESTIC HOT WATER
	DN	DOWN
	DIW	DOWN IN WALL
	E, EX	EXISTING
		FLANGE
	FCO	FLOOR CLEAN OUT
•	FD	FLOOR DRAIN
×	FS	FLOOR SINK
	GSM	GALVANIZED SHEET METAL
	GCO	GRADE CLEAN OUT
	GW	GREASE WASTE
	НВ	HOSE BIB
	HW	HOT WATER SUPPLY
	HWR	HOT WATER RECIRC
	N	NEW
		NEW CONNECTION TO EXISTING
0	ОН	OVERHEAD
		PIPE CAP
		PIPE TURNED DOWN
O		PIPE TURNED UP
\bigcirc		PRESSURE GAUGE
		PRESSURE REGULATOR
		P-TRAP
\$		RELIEF VALVE
<u>~</u>		REMOVE TO THIS POINT
	SS	SANITARY SEWAGE (BELOW GRADI
M	SOV	SHUT-OFF VALVE
	SK	SINK
	31	STRAINER
Щ 		THERMOMETER
	TMV	THERMOSTATIC VALVE
	TP	TRAP PRIMER
X		TRIPLE DUTY VALVE
K	UG	TRIPLE DUTY VALVE
		UNDERGROUND UNION
	UG UIW	UNDERGROUND
		UNDERGROUND UNION
	UIW	UNDERGROUND UNION UP IN WALL
	UIW	UNDERGROUND UNION UP IN WALL URINAL
	UIW UR V	UNDERGROUND UNION UP IN WALL URINAL VENT
	UIW UR V VTR	UNDERGROUND UNION UP IN WALL URINAL VENT VENT TO ROOF



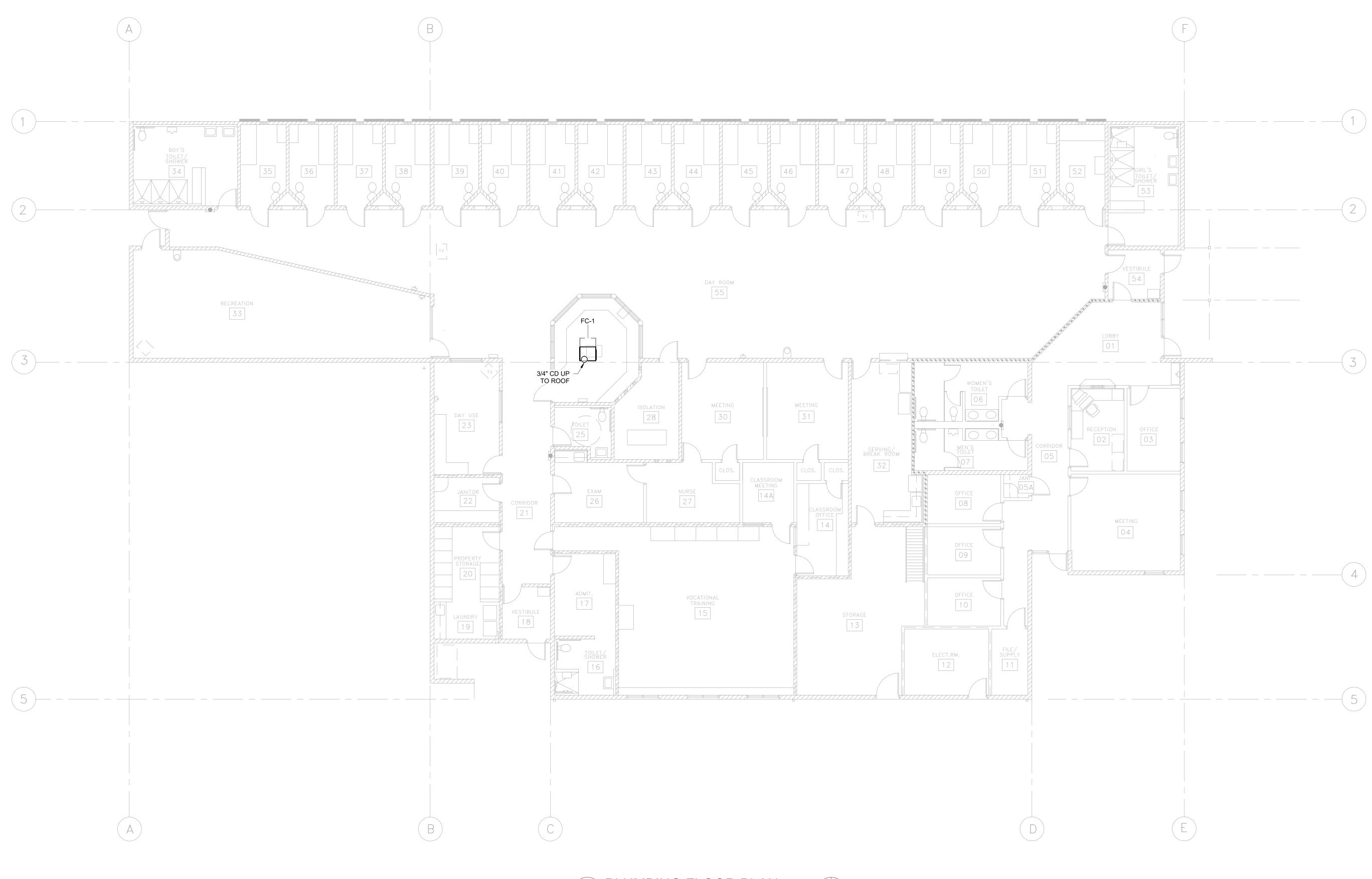
(E) ÉF-1

+---



1 PLUMBING DEMOLITION ROOF PLAN P210 1/8" = 1'-0"

	FRONTIER
	CONSULTING ENGINEERS 2727 Bechelli Lane - Redding, CA 96002 Ph: (530) 232-6160 - www.frontierce.com
DF C(RE UN TH	L IDEAS, DESIGNS, AND PLANS REPRESENTED BY THIS RAWING ARE THE EXCLUSIVE PROPERTY OF FRONTIER ONSULTING ENGINEERS, INC. AND SHALL NOT BE PRODUCED WITHOUT PRIOR WRITTEN PERMISSION. ANY VAUTHORIZED REUSE OF THIS DRAWING SHEET OTHER IAN FOR THE PROJECT AND LOCATION SHOWN IS ROHIBITED.
	LICENSE STAMP
	PROFESSION P
	Eld xLXX. 05-31-2026 01
	UF CALITO
	KEY PLAN
	PROJECT NAME
	HVAC REPLACEMENT
	FOR
	HUMBOLDT COUNTY REGIONAL FACILITY
	2004 HARRISON AVENUE
	EUREKA, CA 95501
<u> </u>	NO. REVISIONS DATE
_	
_	
_	
_	
_	
_	
_	
_	
	SHEET TITLE
F	PLUMBING DEMOLITION ROOF PLAN
	ISSUED FOR: CONSTRUCTION
I	DOCUMENTS DATE: 9/20/2024
-	DRAWN BY: EG REVIEWED BY: NW SCALE: 1/8" = 1'-0"
-	SCALE: 1/8" = 1'-0" PROJECT NO: 22007
	D210
1	ΓΖΙU
- - - - -	ISSUED FOR: CONSTRUCTION DOCUMENTS DATE: 9/20/2024 DRAWN BY: EG REVIEWED BY: NW SCALE: 1/8" = 1'-0"





FRONTIER CONSULTING ENGINEERS 2727 Bechelli Lane - Redding, CA 96002 Ph: (530) 232-6160 - www.frontierce.com
ALL IDEAS, DESIGNS, AND PLANS REPRESENTED BY THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF FRONTIER CONSULTING ENGINEERS, INC. AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION. ANY UNAUTHORIZED REUSE OF THIS DRAWING SHEET OTHER THAN FOR THE PROJECT AND LOCATION SHOWN IS PROHIBITED.
LICENSE STAMP
KEY PLAN
PROJECT NAME
HVAC REPLACEMENT
FOR
HUMBOLDT COUNTY REGIONAL FACILITY
2004 HARRISON AVENUE EUREKA, CA 95501
NO. REVISIONS DATE
SHEET TITLE
PLUMBING FLOOR PLAN
ISSUED FOR: CONSTRUCTION DOCUMENTS
DATE: 9/20/2024 DRAWN BY: EG REVIEWED BY: NW SCALE: 1/8" = 1'-0" DRO JECT NO: 22007
PROJECT NO: 22007

E	ELECTRICAL ABBREVIA
А	-AMMETER, AMPERE
AC	-ALTERNATING CURRENT
ACH	-ABOVE COUNTER HEIGHT
AFCI	-ARC FAULT CIRCUIT INTERRUPT
AFF	-ABOVE FINISHED FLOOR
AIC	-AMPS INTERRUPTING CAPACITY
ATS	-AUTOMATIC TRANSFER SWITCH
BRKR	-BREAKER
BOE	-BOTTOM OF EQUIPMENT
CEC	-CALIFORNIA ELECTRICAL CODE
C/COND	-CONDUIT
СКТ	-CIRCUIT
COD	-CENTER OF DEVICE
СТ	-CURRENT TRANSFORMER
DC	-DIRECT CURRENT
(E)	-EXISTING
G	-GROUND
GFCI	-GROUND FAULT CIRCUIT INTERRUP
J	-JUNCTION BOX
LCP	-LIGHTING CONTROL PANEL
LTR	-LIGHTING
MFR	-MANUFACTURER
MSB	-MAIN SWITCH BOARD
MTS	-MANUAL TRANSFER SWITCH
NEC	-NATIONAL ELECTRIC CODE
NEMA	-NATIONAL ELECTRIC MANUFACTURER'S ASS
Ν	-NEUTRAL
PB	-PULLBOX
PC	-PHOTOCELL
PNL	-PANELBOARD
RECEPT	-RECEPTACLE
SWBD	-SWITCHBOARD
Т	-THERMOSTAT OR TELE CONDUIT
TOD	-TOP OF DEVICE
TYP	-TYPICAL
V	-VOLTMETER, VOLT
W	-WATT
WP	-WEATHERPROOF (NEMA 3R)
XFMR	-TRANSFORMER
	1

 \bigotimes

 $\langle\!\langle$

 $\langle \langle \rangle \rangle$

SINGLE FACE ILLUMINATED EXIT SIGN

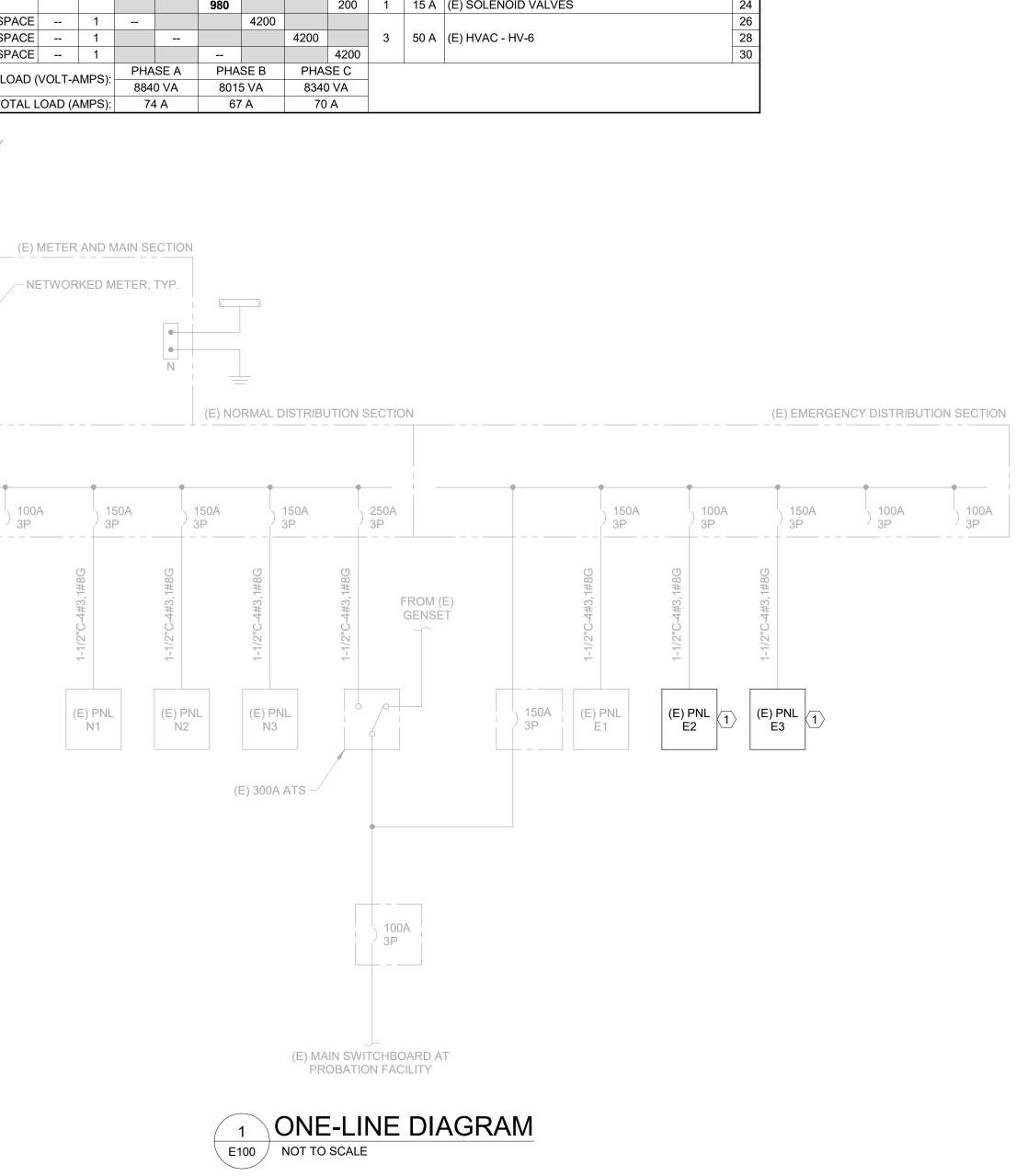
DOUBLE FACED ILLUMINATED DIRECTIONAL EXIT SIGN.

SINGLE FACED ILLUMINATED DIRECTIONAL EXIT SIGN.

LED STANDARD EMERGENCY LIGHT

VIATIONS	EL	_ECTRICAL LEGEND	BRANCH PAN		E2 /olts:	120/208 Wy	e		A.I.C.	RATING:	10 KAIC	
RE	SYMBOLS		SUPPLY FROM: MOUNTING SURFACT		PHASES:	3				ATING:	225 A 225 A	
RENT		CONDUIT EXPOSED	MOUNTING SURFACT		VIRES: CIRCUITS:	4 42			MAIN:		225 A	
EIGHT		CONDUIT CONCEALED OR BURIED										
FERRUPT		CROSS HATCHES W/ BARS INDICATES NUMBER OF #10 CONDUCTORS	-							- 1		
.OOR		1/2" C - 2# 12.1 #12G CAT 5e LIGHTING CABLE				A B	с	AE	вс			
APACITY	►LA-2	HOME RUN-DESTINATION SHOWN		it Description	Rating Poles	s 640		700		Poles	Rating Circuit Description	СК
SWITCH		CONDUIT DOWN) EM LIGHTING - CELLS 35-43) EM LIGHTING - CELLS 44-52	2 20 A 1	640)	700 70	0	1	15 A (E) EF-1 15 A (E) EF-4	2
			5 7 (E) EM	E) EM LIGHTING - 24) 1 LIGHTING - CELLS 33, 34, 55		810	180	400	400) 3	15 A (E) HV-1	6
MENT			9	(E) EM LIGHTING - 28	8 20 A 1	60		40				1(
AL CODE			11 (E) EM LIGH	TING - CELLS 15-18, 21 26, 27 (E) CCTV CAMERAS - 7-9		300	1020	641	641	2	15 A (N) HVAC - HP-1	2 12
		TELEPHONE CONNECTION POINT; 18" TO COD AFF UNLESS OTHERWISE NOTED. 3/4" C - STUB UP TO CEILING PLENUM	15 17 (E)	(E) CCTV CAMERAS - 6, 10		200		-	- 200	1	(N) SPACE	(2) 16 18
		DATA CONNECTION POINT; 18" TO COD AFF UNLESS OTHERWISE NOTED. 3/4" C - STUB UP TO CEILING PLENUM		RECEPTS - CONTROL ROOM RECEPTS - CONTROL ROOM		400	400	200	200	1	15 A (E) EF-7 15 A (E) EF-6	20
05		TELE/DATA CONNECTION POINT; 18" TO COD AFF UNLESS		RECEPTS - CONTROL ROOM CEPTS - FIRE ALARM PANEL		400	200	20	00 980	1	15 A (E) EF-10	22 24
CE		OTHERWISE NOTED. 3/4" C - STUB UP TO CEILING PLENUM	25	(E) RECEPTS - 26	6 20 A 1			980			15 A (E) HVAC - HV-7	3 20
RMER	\rightarrow	WALL SWITCH, 46" TO COD AFF UNLESS OTHERWISE NOTED	27 29	(E) RECEPTS - 27 (E) CCTV CAMERA - 1		400	100	98	0 150	0 1	20 A (E) INTERCOM CONTROLLER	28
IT	⇒3	INDICATES THREE-POLE WALL SWITCH	31	(E) SEWER ALARM - E2-31	1 20 A 1			1500	00	1	20 A (E) SWITCHER POWER	32
	⇒D	INDICATES WALL SWITCH WITH INTEGRAL DIMMER	33 35		D 20 A 1 D 20 A 1	70	70	15	150	0 1	20 A (E) DOOR AND CONTROLLER 20 A (E) LOAD	34
	\$oc	INDICATES WALL SWITCH WITH INTEGRAL OCCUPANCY SENSOR	37 39	(E) A/C CLASSROON	VI 40 A 2	2900 290		1000 90	0	1	20 A (E) EF-5 20 A (E) LOAD	38
NTERRUPT	Sa \$b \$c \$d	INDICATES WALL SWITCHES FOR MULTIPLE LIGHTING GROUPS	41	SPACE	E 1				900) 1	20 A (E) POWER SUPPLY TO LVLC	42
(\$\$	INDICATES LOW VOLTAGE WALL SWITCH		TOTAL LOAD) (VOLT-AMPS):): PHASE A 11191 VA	9350 V		HASE C 3091 VA			
PANEL	\$κ	INDICATES KEY-OPERATED WALL SWITCH		TOTAL	LOAD (AMPS):		80 /		67 A			
	\$т	INDICATES WALL SWITCH WITH INTEGRAL TIMER										
R	OC	OCCUPANCY SENSOR	BRANCH PAN	IEL F	E3							
ARD	J	JUNCTION BOX			OLTS:	120/208 Wy	e			RATING:		
	CR		SUPPLY FROM:	P'	PHASES:	3			BU2 K	ATING:	225 A	
SWITCH		CONTACT RELAY	MOUNTING SURFAC		VIRES:	4			MAIN:		225 A	
		20A SPECIFICATION GRADE RECEPTACLE, COORDINATE	MOUNTING SURFACT	E W	VIRES: CIRCUITS:	4 30						
CODE		20A SPECIFICATION GRADE RECEPTACLE, COORDINATE CONFIGURATION W/ SUPPLIED EQUIPMENT		E W		4 30						
CODE		20A SPECIFICATION GRADE RECEPTACLE, COORDINATE		E W		4 30						
CODE		20A SPECIFICATION GRADE RECEPTACLE, COORDINATE CONFIGURATION W/ SUPPLIED EQUIPMENT 20A SPECIFICATION GRADE QUADRUPLEX RECEPTACLE 208/240V RECEPTACLE 18" COD UNLESS OTHERWISE NOTED ON PLANS	ENCLOSURE: NEMA 1	E W		A B	С	A E	MAIN:		225 A	
CODE		20A SPECIFICATION GRADE RECEPTACLE, COORDINATE CONFIGURATION W/ SUPPLIED EQUIPMENT 20A SPECIFICATION GRADE QUADRUPLEX RECEPTACLE 208/240V RECEPTACLE 18" COD UNLESS OTHERWISE NOTED ON PLANS SPLITWIRED RECEPTACLES	ENCLOSURE: NEMA 1	E W	CIRCUITS:	A B		А Е 700	MAIN:			Ск 2
SWITCH CODE RER'S ASSOCIATION	$\begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} $	20A SPECIFICATION GRADE RECEPTACLE, COORDINATE CONFIGURATION W/ SUPPLIED EQUIPMENT 20A SPECIFICATION GRADE QUADRUPLEX RECEPTACLE 208/240V RECEPTACLE 18" COD UNLESS OTHERWISE NOTED ON PLANS	ENCLOSURE: NEMA 1	E W C it Description (E) HVAC - EF-2 (E) HVAC - EF-11	Rating Poles 2 15 1 1 15 1	A B			MAIN: 3 C	Poles 1 1	225 A Rating Circuit Description 15 A (E) HVAC - EF-8 15 A (E) HVAC - EF-9	Ск 2 4
CODE		20A SPECIFICATION GRADE RECEPTACLE, COORDINATE CONFIGURATION W/ SUPPLIED EQUIPMENT 20A SPECIFICATION GRADE QUADRUPLEX RECEPTACLE 208/240V RECEPTACLE 18" COD UNLESS OTHERWISE NOTED ON PLANS SPLITWIRED RECEPTACLES	ENCLOSURE: NEMA 1	E W C it Description (E) HVAC - EF-2 (E) HVAC - EF-11 (E) HVAC - EF-3	Rating Poles 2 15 A 1 1 15 A 1 3 15 A 1	A B 700 75 400	700	700	MAIN: 3 C	Poles 1 1 1 1	225 A Rating Circuit Description 15 A (E) HVAC - EF-8 15 A (E) HVAC - EF-9 15 A (E) SPARE	2 4 6 8
CODE	$\begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} $	20A SPECIFICATION GRADE RECEPTACLE, COORDINATE CONFIGURATION W/ SUPPLIED EQUIPMENT 20A SPECIFICATION GRADE QUADRUPLEX RECEPTACLE 208/240V RECEPTACLE 18" COD UNLESS OTHERWISE NOTED ON PLANS SPLITWIRED RECEPTACLES FUSED DISCONNECT	ENCLOSURE: NEMA 1	E W C it Description (E) HVAC - EF-2 (E) HVAC - EF-11	Rating Poles 2 15 A 1 1 15 A 1 3 15 A 1	A B 5 700 75	700	700 50	MAIN: 3 C 10 0 10 0	Poles 1 1 1 1	225 A Rating Circuit Description 15 A (E) HVAC - EF-8 15 A (E) HVAC - EF-9	CK 2 4 6 8 10 12
CODE RER'S ASSOCIATION	$\begin{array}{c} \hline \\ \hline $	20A SPECIFICATION GRADE RECEPTACLE, COORDINATE CONFIGURATION W/ SUPPLIED EQUIPMENT 20A SPECIFICATION GRADE QUADRUPLEX RECEPTACLE 208/240V RECEPTACLE 18" COD UNLESS OTHERWISE NOTED ON PLANS SPLITWIRED RECEPTACLES FUSED DISCONNECT NON-FUSED DISCONNECT	ENCLOSURE: NEMA 1 CKT Circui CKT Circui 1 3 5 7 9 11 13	E W c it Description (E) HVAC - EF-2 (E) HVAC - EF-11 (E) HVAC - EF-3 (E) HVAC - HV-2	Rating Poles 2 15 A 1 1 15 A 1 3 15 A 1 2 15 A 3	A B 700 700 400 400 1460	700 700 400	700 50 50 0 0 400 4	MAIN: 3 C 3 C 4 0 5 0 6 0 7 0 7 0 7 0 7 0 7 0 7 0 7 0 7	Poles 1 1 1 3	Rating Circuit Description 15 A (E) HVAC - EF-8 15 A (E) HVAC - EF-9 15 A (E) SPARE 15 A (E) SPARE 15 A (E) SPARE	2 4 6 8 10 12 14
CODE RER'S ASSOCIATION	$\begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $	20A SPECIFICATION GRADE RECEPTACLE, COORDINATE CONFIGURATION W/ SUPPLIED EQUIPMENT 20A SPECIFICATION GRADE QUADRUPLEX RECEPTACLE 208/240V RECEPTACLE 18" COD UNLESS OTHERWISE NOTED ON PLANS SPLITWIRED RECEPTACLES FUSED DISCONNECT NON-FUSED DISCONNECT FUSED SWITCH LAY-IN 2 FT x 2 FT.	ENCLOSURE: NEMA 1 CKT Circui CKT Circui 3 5 7 9 11	E W c it Description (E) HVAC - EF-2 (E) HVAC - EF-11 (E) HVAC - EF-3 (E) HVAC - HV-2	Rating Poles 2 15 A 1 1 15 A 1 3 15 A 1	A B 5 700 700 75 400 400	700 700 400	700 50 50 0 C	MAIN: 3 C 3 C 4 0 5 0 6 0 7 0 7 0 7 0 7 0 7 0 7 0 7 0 7	Poles 1 1 1 1 3 3 3	225 A Rating Circuit Description 15 A (E) HVAC - EF-8 15 A (E) HVAC - EF-9 15 A (E) SPARE	2 4 6 8 10 12
CODE	$ \begin{array}{c} $	20A SPECIFICATION GRADE RECEPTACLE, COORDINATE CONFIGURATION W/ SUPPLIED EQUIPMENT 20A SPECIFICATION GRADE QUADRUPLEX RECEPTACLE 208/240V RECEPTACLE 18" COD UNLESS OTHERWISE NOTED ON PLANS SPLITWIRED RECEPTACLES FUSED DISCONNECT NON-FUSED DISCONNECT FUSED SWITCH LAY-IN 2 FT x 2 FT. SURFACE MOUNTED 2 FT x 4 FT FLUORESCENT LIGHT FIXTURE.	ENCLOSURE: NEMA 1	E W c it Description (E) HVAC - EF-2 (E) HVAC - EF-11 (E) HVAC - EF-3 (E) HVAC - HV-2 HVAC - HV-3	Rating Poles 2 15 A 1 1 15 A 1 3 15 A 1 2 15 A 3 3 25 A 3	A B 700 700 400 400 1460 1460 980	 700 700 400 400 1460 	700 500 700 500 0 0 00 400 0 400 400 0 400	MAIN: 3 C 3 C 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Poles 1 1 1 1 3 3 3	Rating Circuit Description 15 A (E) HVAC - EF-8 15 A (E) HVAC - EF-9 15 A (E) SPARE 20 A SPARE	2 4 6 8 10 12 14 16 18 20
CODE RER'S ASSOCIATION	$\begin{array}{c} \hline \\ \hline $	20A SPECIFICATION GRADE RECEPTACLE, COORDINATE CONFIGURATION W/ SUPPLIED EQUIPMENT 20A SPECIFICATION GRADE QUADRUPLEX RECEPTACLE 208/240V RECEPTACLE 18" COD UNLESS OTHERWISE NOTED ON PLANS SPLITWIRED RECEPTACLES FUSED DISCONNECT NON-FUSED DISCONNECT FUSED SWITCH LAY-IN 2 FT x 2 FT.	ENCLOSURE: NEMA 1	E W C it Description (E) HVAC - EF-2 (E) HVAC - EF-3 (E) HVAC - EF-3 (E) HVAC - HV-2 HVAC - HV-3 HVAC - HV-4	Rating Poles 2 15 A 1 1 15 A 1 3 15 A 1 2 15 A 3 3 25 A 3 4 15 A 3	A B 5 700 75 400 75 400 400 1460 146	 700 700 400 400 1460 1460 980 	700 500 0 500 0 0 400 0 0 400 0 0 0 0	MAIN: 3 C 3 C 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Poles 1 1 1 1 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1	Rating Circuit Description 15 A (E) HVAC - EF-8 15 A (E) HVAC - EF-9 15 A (E) SPARE 15 A (E) SPARE 15 A (E) SPARE 15 A (E) HVAC - HV-5	2 4 6 10 12 14 16 18 20 22 24
CODE RER'S ASSOCIATION	$ \begin{array}{c} $	20A SPECIFICATION GRADE RECEPTACLE, COORDINATE CONFIGURATION W/ SUPPLIED EQUIPMENT 20A SPECIFICATION GRADE QUADRUPLEX RECEPTACLE 208/240V RECEPTACLE 18" COD UNLESS OTHERWISE NOTED ON PLANS SPLITWIRED RECEPTACLES FUSED DISCONNECT NON-FUSED DISCONNECT FUSED SWITCH LAY-IN 2 FT x 2 FT. SURFACE MOUNTED 2 FT x 4 FT FLUORESCENT LIGHT FIXTURE. SURFACE MOUNTED 1 FT x 4 FT FLUORESCENT LIGHT FIXTURE.	ENCLOSURE: NEMA 1	E W C it Description (E) HVAC - EF-2 (E) HVAC - EF-11 (E) HVAC - EF-3 (E) HVAC - HV-2 HVAC - HV-3 HVAC - HV-4 (E) SPACE	Rating Poles 2 15 A 1 1 15 A 1 3 15 A 1 2 15 A 3 3 25 A 3 4 15 A 3 5 1	A B 700 700 400 400 1460 1460 980	 700 700 400 400 400 400 9 9 980 9 	700 700 50 0 0 400 400 0 400 0	MAIN: 3 C 3 C 400 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Poles 1 1 1 1 3 3 3 1 1 1 1 1 1 1 1 1 1 1 1	Rating Circuit Description 15 A (E) HVAC - EF-8 15 A (E) HVAC - EF-9 15 A (E) SPARE 15 A (E) HVAC - HV-5 20 A SPARE 15 A (E) SOLENOID VALVES	2 4 6 10 12 14 16 18 20 22 24 24 26
CODE RER'S ASSOCIATION	$ \begin{array}{c} $	20A SPECIFICATION GRADE RECEPTACLE, COORDINATE CONFIGURATION W/ SUPPLIED EQUIPMENT 20A SPECIFICATION GRADE QUADRUPLEX RECEPTACLE 208/240V RECEPTACLE 18" COD UNLESS OTHERWISE NOTED ON PLANS SPLITWIRED RECEPTACLES FUSED DISCONNECT NON-FUSED DISCONNECT FUSED SWITCH LAY-IN 2 FT x 2 FT. SURFACE MOUNTED 2 FT x 4 FT FLUORESCENT LIGHT FIXTURE.	ENCLOSURE: NEMA 1	E W C it Description (E) HVAC - EF-2 (E) HVAC - EF-3 (E) HVAC - EF-3 (E) HVAC - HV-2 HVAC - HV-3 HVAC - HV-4	Rating Poles 2 15 A 1 1 15 A 1 3 15 A 1 2 15 A 1 3 15 A 1 3 15 A 3 3 25 A 3 4 15 A 3 5 1 6 1 7 1	A B 5 700 75 700 75 400 400 400 400 1460 146 980 980 980 980 980 980 	A 100 a 10	700 500 0 500 0 0 400 400 0 400 0 0 0 0 4200 420 4200	MAIN: 3 C 3 C 4 C 4 C 4 C 4 C 4 C 4 C 4 C 4	Poles 1 1 1 1 1 3 3 1 1 1 1 1 1 1 1 1 1 1 1	Rating Circuit Description 15 A (E) HVAC - EF-8 15 A (E) HVAC - EF-9 15 A (E) SPARE	2 4 6 10 12 14 16 18 20 22 24
CODE RER'S ASSOCIATION	$ \begin{array}{c} $	20A SPECIFICATION GRADE RECEPTACLE, COORDINATE CONFIGURATION W/ SUPPLIED EQUIPMENT 20A SPECIFICATION GRADE QUADRUPLEX RECEPTACLE 208/240V RECEPTACLE 18" COD UNLESS OTHERWISE NOTED ON PLANS SPLITWIRED RECEPTACLES FUSED DISCONNECT NON-FUSED DISCONNECT FUSED SWITCH LAY-IN 2 FT x 2 FT. SURFACE MOUNTED 2 FT x 4 FT FLUORESCENT LIGHT FIXTURE. SURFACE MOUNTED 1 FT x 4 FT FLUORESCENT LIGHT FIXTURE.	ENCLOSURE: NEMA 1 CKT Circui 1 3 5 7 9 11 13 15 4 17 19 21 3 23 25 27	E W c it Description (E) HVAC - EF-2 (E) HVAC - EF-3 (E) HVAC - EF-3 (E) HVAC - HV-2 HVAC - HV-2 HVAC - HV-4 (E) SPACE (E) SPACE (E) SPACE	Rating Poles 2 15 A 1 1 15 A 1 3 15 A 1 2 15 A 1 3 15 A 1 3 15 A 3 3 25 A 3 4 15 A 3 5 1 6 1 7 1	A B 5 700 700 400 400 400 400 400 980 980 980 980 980 980 980 9	A00	700 50 700 50 0 0 0 400 40 400 40 400 0 4200 0 4200 420 5 B P	MAIN: 3 C 3 C 4 C 5 C 6 C 7 C 7 C 7 C 7 C 7 C 7 C 7 C 7	Poles 1 1 1 1 1 3 3 1 1 1 1 1 1 1 1 1 1 1 1	Rating Circuit Description 15 A (E) HVAC - EF-8 15 A (E) HVAC - EF-9 15 A (E) SPARE 15 A (E) HVAC - HV-5 20 A SPARE 15 A (E) SOLENOID VALVES	2 4 6 8 10 12 14 16 18 20 22 24 26 28

FROM UTILITY UTILITY PAD MOUNTED XFMR (E) METER AND MAIN SECTION NETWORKED METER, TYP. M 800A 3P 100A 3P 150A 3P 150A 3P



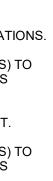
 REUSE EXISTING BREAKER TO SERVE NEW EQUIPMENT.
 REPLACE EXISTING BREAKER(S) WITH NEW BREAKER(S) TO SERVE NEW EQUIPMENT AS SHOWN. MODIFY PANEL AS REQUIRED.

 REPLACE EXISTING BREAKER(S) WITH NEW BREAKER(S) TO SERVE NEW EQUIPMENT AS SHOWN. MODIFY PANEL AS REQUIRED.
 RELISE EXISTING REPLACED TO OFFICE NEW FOUNDATION

 KEYED NOTES

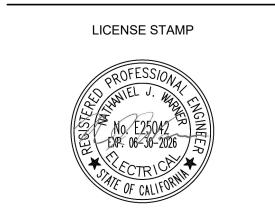
 1 REFER TO PANEL SCHEDULE FOR SCOPE OF MODIFICATIONS.

 2 REPLACE EXISTING REPLACE CONTINUES OF MODIFICATIONS.





ALL IDEAS, DESIGNS, AND PLANS REPRESENTED BY THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF FRONTIER CONSULTING ENGINEERS, INC. AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION. ANY UNAUTHORIZED REUSE OF THIS DRAWING SHEET OTHER THAN FOR THE PROJECT AND LOCATION SHOWN IS PROHIBITED.



KEY PLAN

PROJECT NAME

HVAC REPLACEMENT

FOR

HUMBOLDT COUNTY REGIONAL FACILITY

2004 HARRISON AVENUE EUREKA, CA 95501

NO.	REVISIONS	DATE
	SHEET TITLE	
	TRICAL LE	
	ISSUED FOR:	
	DNSTRUCT	
DATE:	3Y:	9/20/2024 NM
REVIEWE		NW 1/8" = 1'-0"
PROJECT	۲NO:	22007
	E100	

PART 1 - GENERAL

1.1 GENERAL

- A. ELECTRICAL PLAN DRAWINGS SHOW ONLY GENERAL LOCATIONS OF EQUIPMENT, DEVICES, AND RACEWAY UNLESS SPECIFICALLY DIMENSIONED. THE CONTRACTOR IS RESPONSIBLE FOR THE PROPER ROUTING OF RACEWAY, SUBJECT TO THE APPROVAL OF THE ENGINEER. MAKE ADJUSTMENTS AS NECESSARY TO WIRING, CONDUIT, DISCONNECTS, BRANCH CIRCUIT PROTECTION, AND OTHER AFFECTED MATERIAL OR EQUIPMENT TO ACCOMMODATE ACTUAL EQUIPMENT SUPPLIED FOR THIS PROJECT.
- 1.2 CODES, PERMITS, AND REGULATIONS
- A. DO ALL WORK AND INSTALL ALL MATERIALS AND EQUIPMENT IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC), APPLICABLE STATE AND LOCAL LAWS AND ORDINANCES, AND THE POWER COMPANY. CONFLICTS, IF ANY, WILL BE RESOLVED AT THE DISCRETION OF THE ENGINEER.
- 1.3 COORDINATION
- A. CLOSE COORDINATION BETWEEN THE ELECTRICAL AND MECHANICAL TRADES IS A PART OF THE WORK THAT IS REQUIRED BY THIS CONTRACT. NO ALLOWANCE WILL BE MADE FOR OMISSIONS BASED ON INCORRECTLY ASSUMING ANOTHER TRADE WILL BE PERFORMING YOUR WORK. CONFIRM YOUR SCOPE OF WORK WITH THE GENERAL CONTRACTOR.
- PART 2 PRODUCTS

2.1 GENERAL

- A. UNLESS OTHERWISE INDICATED, PROVIDE ALL FIRST-QUALITY NEW MATERIALS, FREE FROM ANY DEFECTS, AND SUITABLE FOR THE INTENDED USE AND THE SPACE PROVIDED. PROVIDE MATERIALS APPROVED BY UL WHEREVER STANDARDS HAVE ITEMS NOT SPECIFICALLY SHOWN OR SPECIFIED WHICH ARE REQUIRED TO PROVIDE THE COMPLETE SYSTEMS SPECIFIED HEREIN. WHERE TWO OR MORE UNITS OF THE SAME CLASS OF MATERIAL OR EQUIPMENT ARE REQUIRED, PROVIDE PRODUCTS OF A SINGLE MANUFACTURER. COMPONENT PARTS OF MATERIALS OR EQUIPMENT NEED NOT BE
- PRODUCTS OF THE SAME MANUFACTURER. 2.2 EQUIPMENT FINISH
- A. UNLESS OTHERWISE INDICATED, FINISH FOR ELECTRICAL EQUIPMENT AND ENCLOSURES SHALL BE MANUFACTURER'S STANDARD GRAY OR ANSI 61 GRAY OVER A PRIMER AND RUST INHIBITOR.

2.3 JUNCTION AND PULLBOXES

- A. LARGE SHEET STEEL BOX: NEMA 1. 1. BOX: CODE-GAUGE, GALVANIZED STEEL. 2. COVER: FULL ACCESS, SCREW TYPE.
- 3. MACHINE SCREWS: CORROSION-RESISTANT.
- B. LARGE WEATHERPROOF: NEMA 3R.
- 1. BOX: GALVANIZED STEEL. 2. COVER: SCREW WITH PROVISIONS FOR PAD LOCKING. 3. EMBOSSED MOUNTING HOLES ON BACK OF ENCLOSURE. 4. NO GASKETING.

2.4 CONDUIT AND TUBING

- A. ELECTRIC METALLIC TUBING (EMT): 1. MEET REQUIREMENTS OF ANSI C80.3 AND UL 797. 2. MATERIAL: HOT-DIP GALVANIZED, WITH CHROMATED AND LACQUERED PROTECTIVE LAYER.
- B. FLEXIBLE METAL. LIQUID-TIGHT CONDUIT: 1. UL 360 LISTED FOR 105°C INSULATED CONDUCTORS. 2. MATERIAL: GALVANIZED STEEL, WITH AN EXTRUDED PVC JACKET.

2.5 FITTINGS

- A. ELECTRIC METALLIC TUBING:
- 1. MEET REQUIREMENTS OF UL 514B. 2. TYPE: STEEL BODY AND LOCK NUTS WITH STEEL OR MALLEABLE
- IRON COMPRESSION NUTS. 3. TYPE: STEEL BODY WITH SET SCREWS AND INSULATED THROAT.
- c. FLEXIBLE METAL, LIQUID-TIGHT CONDUIT: INSULATED THROAT AND SEALING O-RINGS.

2.6 CONDUCTORS

- A. ALL CONDUCTORS SHOWN SHALL BE NEW UNLESS OTHERWISE INDICATED.
- B. CONDUCTOR TYPE:

1. SOLID COPPER.

C. INSULATION: TYPE THHN/THWN, 90°C DRY OR 75°C WET. 2.7 CONDUCTOR ACCESSORIES

- A. TAPE: 1. GENERAL PURPOSE, FLAME RETARDANT: 7 MIL, VINYL PLASTIC, RATED FOR 90°C MINIMUM MEETING REQUIREMENTS OF UL 510. 2. FLAME RETARDANT, COLD AND WEATHER RESISTANT: 8.5 MIL, VINYL PLASTIC.
- B. CABLE TIES: 1. NYLON, ADJUSTABLE, AND SELF-LOCKING.

ELECTRICAL SPECIFICATIONS

DUTY (HD) TYPE WITH EXTERNAL MARKINGS CLEARLY INDICATING

C. ENCLOSURE: NEMA 12, INDUSTRIAL USE, NEMA 3R, DENOTED BY WP,

D. INTERLOCK: ENCLOSURE AND SWITCH TO PREVENT OPENING COVER

E. LOCKABLE TO THE OPEN POSITION. PROVIDE TAG READING "DO NOT

A. COORDINATE ELECTRICAL WORK WITH THE OWNER AND WORK OF OTHER TRADES TO AVOID CONFLICTS, ERRORS, DELAYS, AND

A. FOLLOWING INSTALLATION. PROTECT MATERIALS, EQUIPMENT, AND

INSULATION FROM CORROSION, PHYSICAL DAMAGE, AND MOISTURE.

CAP CONDUIT RUNS DURING CONSTRUCTION WITH MANUFACTURED

SEALS. KEEP OPENINGS IN BOXES OR EQUIPMENT CLOSED DURING

A. FOLLOW THE MANUFACTURER'S INSTALLATION RECOMMENDATIONS

UNLESS OTHERWISE INDICATED. FOLLOW THE ENGINEER'S DECISION,

UNNECESSARY INTERFERENCE DURING CONSTRUCTION.

2.8 DISCONNECT SWITCH, INDIVIDUAL, 0 TO 600 VOLTS

ON/OFF POSITIONS.

OPEN UNDER LOAD."

3.2 PROTECTION DURING CONSTRUCTION

3.3 MATERIAL AND EQUIPMENT INSTALLATION

PART 3 - EXECUTION

3.1 GENERAL PROCEDURES

CONSTRUCTION.

UNLESS OTHERWISE SHOWN.

WITH SWITCH IN THE ON POSITION.

	Α.	NEMA KS 1.
)F	В.	QUICK-MAKE, QUICK-BREAK, MOTOR RATED, LOAD-BREAK, HEAVY-

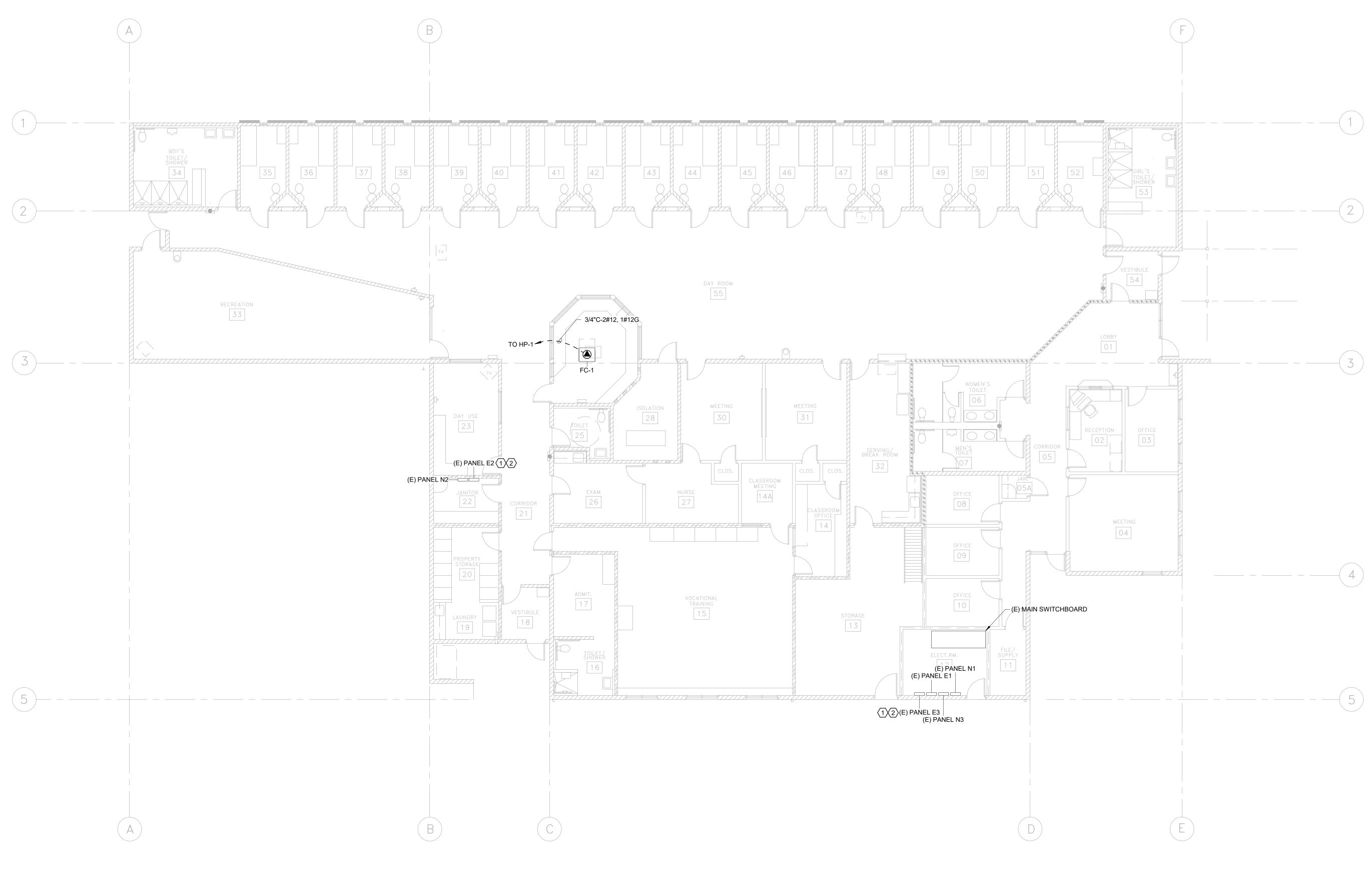
MANUFACTURER'S INSTALLATION INSTRUCTIONS AVAILABLE ON THE JOBSITE FOR REVIEW AT ALL TIMES. 3.4 CUTTING AND PATCHING A. DO NOT CUT OR NOTCH ANY STRUCTURAL MEMBER OR BUILDING SURFACE WITHOUT SPECIFIC APPROVAL OF THE ENGINEER. FOLLOWING SUCH WORK, RESTORE SURFACES NEATLY TO NEW CONDITION USING SKILLED CRAFTSMEN OF THE TRADES INVOLVED.

WHEREVER ANY CONFLICT ARISES. KEEP COPY OF THE

- 3.5 CLEANING AND TOUCH-UP PAINTING A. KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIAL OR RUBBISH. UPON COMPLETION OF WORK, REMOVE MATERIALS, SCRAPS, AND DEBRIS FROM THE PREMISES AND FROM
- THE INTERIOR AND EXTERIOR OF ALL DEVICES AND EQUIPMENT. REFINISH DAMAGED SURFACES TO NEW CONDITION USING SKILLED CRAFTSMEN OF THE TRADES INVOLVED. 3.6 RACEWAY SYSTEM
- A. INTERIOR EXPOSED: 1. ELECTRIC METALLIC TUBING.
- B. INTERIOR, CONCEALED (NOT EMBEDDED IN CONCRETE): 1. GALVANIZED RIGID STEEL: WHEN ENTERING THE BUILDING FROM AN OUTSIDE SOURCE WHERE THE CONDUIT RUN MUST BE
- WATERTIGHT. 2. GALVANIZED STEEL FLEX; USE ONLY IN INDOOR, DRY LOCATIONS FOR FINAL CONNECTION TO FIXTURES IN LAY IN APPLICATIONS OR OTHER EQUIPMENT SUBJECT TO VIBRATION OR MOVEMENT. 3. ELECTRIC METALLIC TUBING: ALL OTHER LOCATIONS.
- C. FOR EQUIPMENT WHERE FLEXIBLE CONNECTION IS REQUIRED TO MINIMIZE VIBRATION: 1. FLEXIBLE METAL, LIQUID-TIGHT CONDUIT.
- 2. LENGTH: 18-INCH MINIMUM, 60-INCH MAXIMUM OF SUFFICIENT LENGTH TO ALLOW MOVEMENT OR ADJUSTMENT OF EQUIPMENT. D. BOX TYPE (ALL RACEWAY SYSTEMS)
- 1. EXTERIOR LOCATIONS: WEATHERPROOF TYPE 3R. INSTALL PULL BOXES WHERE SHOWN AND WHERE NECESSARY TO TERMINATE, TAP-OFF, OR REDIRECT MULTIPLE CONDUIT RUNS. INSTALL PULL BOXES WHERE NECESSARY IN RACEWAY SYSTEM TO FACILITATE CONDUCTOR INSTALLATION. INSTALL PULL BOXES IN CONDUIT RUNS AT LEAST EVERY 150 FEET OR AFTER THE EQUIVALENT OF THREE RIGHT-ANGLE BENDS. USE OUTLET BOXES AS JUNCTION AND PULL BOXES WHEREVER POSSIBLE AND ALLOWED BY APPLICABLE CODES.
- F. SUPPORT BOXES INDEPENDENTLY OF CONDUIT BY ATTACHMENT TO BUILDING STRUCTURE OR STRUCTURAL MEMBER. INSTALL BAR HANGERS IN FRAME CONSTRUCTION, OR FASTEN BOXES DIRECTLY WITH WOOD SCREWS ON WOOD, BOLTS AND EXPANSION SHIELDS ON CONCRETE OR BRICK, TOGGLE BOLTS ON HOLLOW MASONRY UNITS, AND MACHINE SCREWS OR WELDED THREADED STUDS ON STEELWORK.
- 3.7 RACEWAY INSTALLATION
- A. CONDUIT AND TUBING SIZES SHOWN ARE BASED ON THE USE OF COPPER CONDUCTORS.
- B. MAINTAIN RACEWAY ENTIRELY FREE OF OBSTRUCTIONS AND MOISTURE.
- C. GROUP RACEWAYS INSTALLED IN SAME AREA.
- D. FOLLOW STRUCTURAL SURFACE CONTOURS WHEN INSTALLING EXPOSED RACEWAYS. AVOID OBSTRUCTION OF PASSAGEWAYS. RUN EXPOSED RACEWAYS PARALLEL OR PERPENDICULAR TO WALLS, STRUCTURAL MEMBERS, OR INTERSECTIONS OF VERTICAL PLANES.

- E. INSTALL WATERTIGHT CONDUIT SEALING IN OUTDOOR, UNDERGROUND, OR WET LOCATIONS.
- F. ALL METAL CONDUIT TO BE REAMED, BURRS REMOVED, AND CLEANED
- BEFORE INSTALLATION OF CONDUCTORS, WIRES, OR CABLES. G. FOR EMPTY CONDUIT INSTALL A NYLON PULL CORD TO BE USED FOR FUTURE INSTALLATION.
- 3.8 RACEWAY SUPPORT
- A. SUPPORT FROM STRUCTURAL MEMBERS ONLY, AT INTERVALS NOT EXCEEDING NEC REQUIREMENTS, AND IN ANY CASE NOT EXCEEDING 10 FEET. DO NOT SUPPORT FROM PIPING, PIPE SUPPORTS, OR OTHER RACEWAYS.
- B. WALL BRACKETS AND ASSOCIATED HARDWARE IN CONTACT WITH CONCRETE OR MASONRY SHALL BE STAINLESS STEEL. PROVIDE GALVANIZED STEEL AT ALL OTHER LOCATIONS. STRAP HANGERS, AND CEILING TRAPEZE INCLUDING HARDWARE, SHALL BE GALVANIZED STEEL.
- C. PROVIDE AND ATTACH WALL BRACKETS, STRAP HANGERS, OR CEILING TRAPEZE AS FOLLOWS: 1. WOOD: WOOD SCREWS. HOLLOW MASONRY UNITS: TOGGLE BOLTS.
- 3. CONCRETE OR BRICK: EXPANSION SHIELDS, OR THREADED STUDS DRIVEN IN BY POWDER CHARGE, WITH LOCK WASHERS AND NUTS. 4. STEELWORK: MACHINE SCREWS.
- D. NAILS OR WOODEN PLUGS INSERTED IN CONCRETE OR MASONRY FOR ATTACHING RACEWAY NOT PERMITTED. DO NOT WELD RACEWAYS OR PIPE STRAPS TO STEEL STRUCTURES. DO NOT USE WIRE IN LIEU OF STRAPS OR HANGERS.
- 3.9 RACEWAY BENDS
- A. INSTALL CONCEALED RACEWAYS WITH A MINIMUM OF BENDS IN THE SHORTEST PRACTICAL DISTANCE.
- B. AVOID FIELD-MADE BENDS AND OFFSETS, BUT WHERE NECESSARY, MAKE WITH ACCEPTABLE HICKEY OR BENDING MACHINE. DO NOT HEAT METAL RACEWAYS TO FACILITATE BENDING.
- C. FLEXIBLE CONDUIT: DO NOT MAKE BENDS THAT EXCEED ALLOWABLE CONDUCTOR BENDING RADIUS OF CABLE TO BE INSTALLED OR THAT SIGNIFICANTLY RESTRICTS CONDUIT FLEXIBILITY.
- 3.10 EXPANSION/DEFLECTION FITTINGS A. PROVIDE ON ALL RACEWAYS AT STRUCTURAL EXPANSION JOINTS.
- 3.11 TERMINATION AT ENCLOSURES
- A. SHEET METAL BOXES, CABINETS, AND ENCLOSURES:
- 1. ELECTRIC METALLIC TUBING: PROVIDE GLAND COMPRESSION, INSULATED CONNECTORS. 2. FLEXIBLE METAL CONDUIT: PROVIDE TWO SCREW TYPE, INSULATED, MALLEABLE IRON CONNECTORS.
- 3.12 CONDUCTORS
- A. DO NOT SPLICE INCOMING SERVICE CONDUCTORS AND BRANCH POWER DISTRIBUTION CONDUCTORS NO. 6 AWG AND LARGER UNLESS SPECIFICALLY INDICATED OR APPROVED BY THE ENGINEER.
- B. CONNECTIONS AND TERMINATIONS: INSTALL WIRE NUTS ONLY ON SOLID CONDUCTORS.
- INSTALL NYLON SELF-INSULATED CRIMP CONNECTORS AND TERMINATORS FOR CIRCUIT CONDUCTORS NO. 6 AWG AND SMALLER. 3. INSTALL UNINSULATED CRIMP CONNECTORS AND TERMINATORS FOR CIRCUIT CONDUCTORS NO. 4 AWG THROUGH NO. 2/0 AWG.
- 4. INSTALL UNINSULATED, BOLTED, TWO-WAY CONNECTORS AND TERMINATORS FOR CIRCUIT CONDUCTORS NO. 4/0 AWG AND LARGER.
- 5. TAPE INSULATE ALL UNINSULATED CONNECTIONS. 6. PLACE NO MORE THAN ONE CONDUCTOR IN ANY SINGLE-BARREL PRESSURE CONNECTION.
- 7. INSTALL CRIMP CONNECTORS WITH TOOLS APPROVED BY CONNECTOR MANUFACTURER. 8. COMPRESSION LUGS: a. ATTACHED WITH A TOOL SPECIFICALLY DESIGNED FOR PURPOSE.
- b. DO NOT USE PLIERS TYPE CRIMPERS.
- C. DO NOT USE SOLDERED MECHANICAL JOINTS.
- D. SPLICES AND TERMINATIONS: INDOORS: USE GENERAL PURPOSE, FLAME RETARDANT TAPE. 2. OUTDOORS: USE FLAME RETARDANT, COLD- AND WEATHER-
- RESISTANT TAPE. E. CAP SPARE CONDUIT WITH UL LISTED END CAPS.
- F. CABINETS AND PANELS:
- 1. REMOVE SURPLUS WIRE, BRIDLE AND SECURE. 2. WHERE CONDUCTORS PASS THROUGH OPENINGS OR OVER EDGES IN SHEET METAL, REMOVE BURRS CHAMFER EDGES, AND INSTALL BUSHINGS AND PROTECTIVE STRIPS OF INSULATING MATERIAL
- TO PROTECT THE CONDUCTORS.
- 3.13 GROUNDING A. UNLESS OTHERWISE INDICATED, GROUND ALL EXPOSED NONCURRENT-CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, RACEWAY SYSTEMS, AND THE NEUTRAL OF ALL WIRING SYSTEMS IN ACCORDANCE
- WITH THE CEC, STATE, AND OTHER APPLICABLE LAWS AND REGULATIONS. 3.14 TESTING, INSPECTION, AND OBSERVATION
- A. INSULATION TESTING PER CEC 110.7 AND 2018 NFPA 99 6.74.1.2.2. END OF SECTION

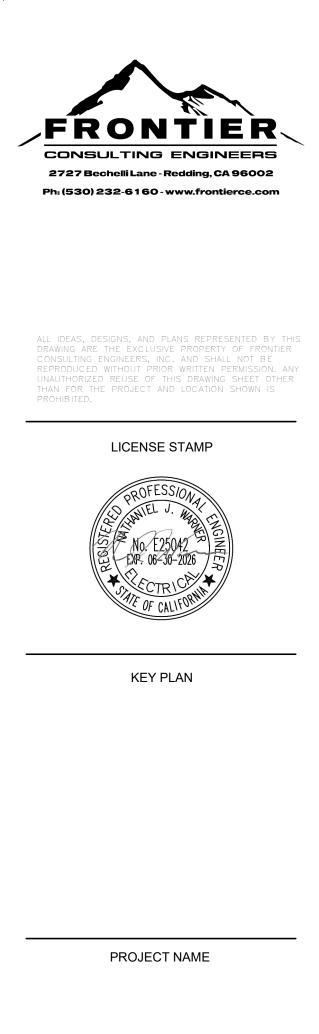
FRONTIER CONSULTING ENGINEERS
2727 Bechelli Lane - Redding, CA 96002 Ph: (530) 232-6160 - www.frontierce.com
ALL IDEAS, DESIGNS, AND PLANS REPRESENTED BY THIS
DRAWING ARE THE EXCLUSIVE PROPERTY OF FRONTIER CONSULTING ENGINEERS, INC. AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION. ANY UNAUTHORIZED REUSE OF THIS DRAWING SHEET OTHER THAN FOR THE PROJECT AND LOCATION SHOWN IS
PROHIBITED.
LICENSE STAMP
PROFESSION P
NO. E25042 LAP. 06-30-2026 CAP. 06-30-2026
ATE OF CALIFORNIA
KEY PLAN
PROJECT NAME
HVAC REPLACEMENT
FOR
HUMBOLDT COUNTY
REGIONAL FACILITY
2004 HARRISON AVENUE EUREKA, CA 95501
EURENA, CA 93301
NO. REVISIONS DATE
SHEET TITLE
ELECTRICAL
SPECIFICATIONS
ISSUED FOR: CONSTRUCTION
DOCUMENTS
DATE: 9/20/2024 DRAWN BY: NM
REVIEWED BY: NW SCALE: 1/8" = 1'-0"
PROJECT NO: 22007
E101



1 ELECTRICAL FLOOR PLAN E210 1/8" = 1'-0"

KEYED NOTES

1 REFER TO ELECTRICAL ONE-LINE DIAGRAM FOR FEEDER AND OVERCURRENT PROTECTION INFORMATION. $\langle 2 \rangle$ REFER TO PANEL SCHEDULE FOR LOAD AND OVERCURRENT PROTECTION INFORMATION.



HVAC REPLACEMENT

FOR

HUMBOLDT COUNTY REGIONAL FACILITY

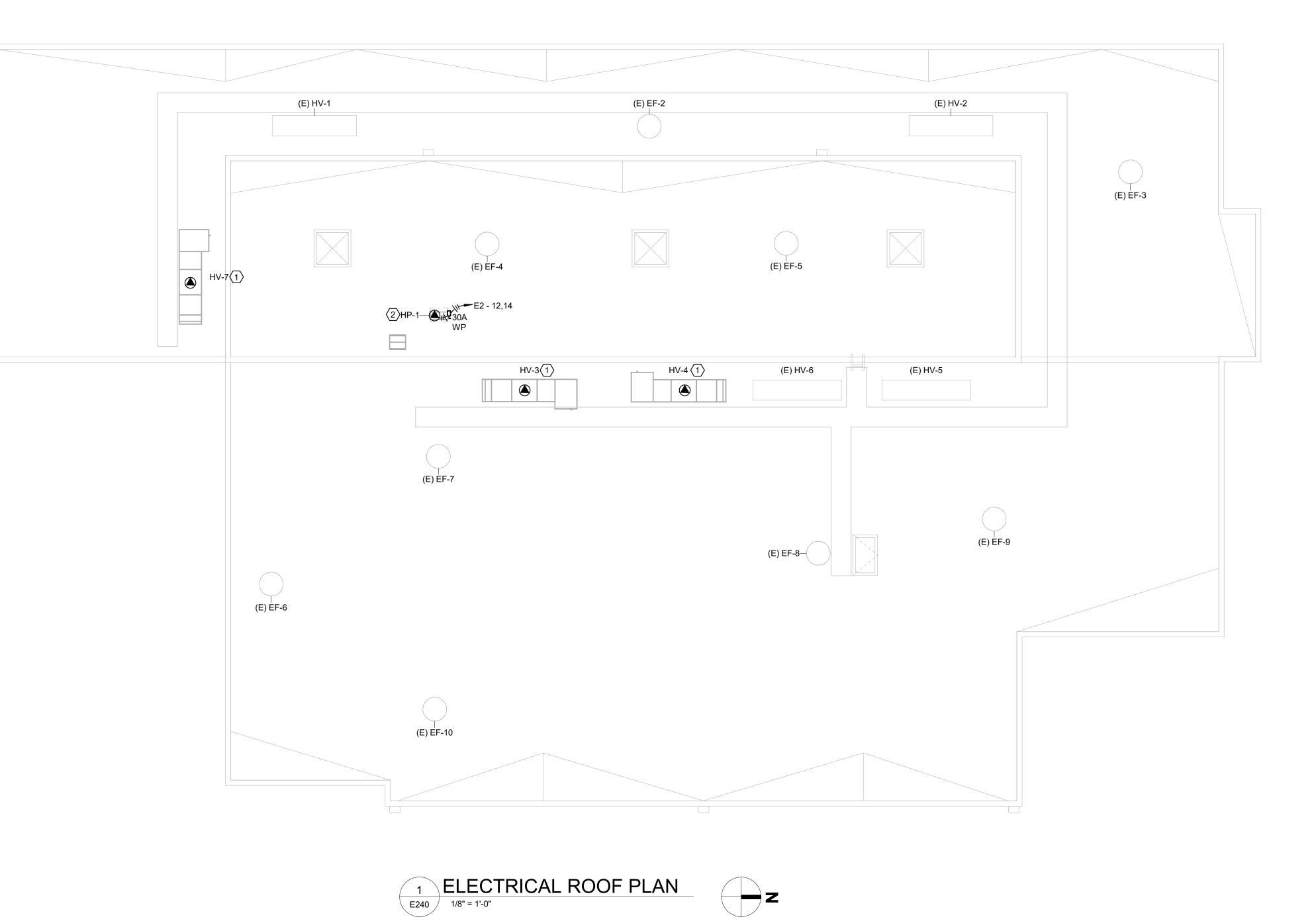
2004 HARRISON AVENUE EUREKA, CA 95501

NO.	REVISIONS	DATE
	SHEET TITLE	
ELE	ECTRICAL FL PLAN	OOR
	ISSUED FOR:	
С	ONSTRUCTION DOCUMENTS	
DATE:		9/20/2024 NM
	ED BY:	NW /8" = 1'-0"
PROJEC		22007
	E210	

(E) EF-1

_

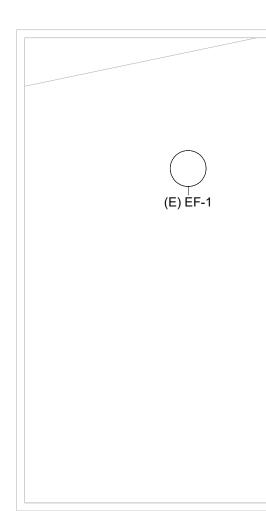
+---



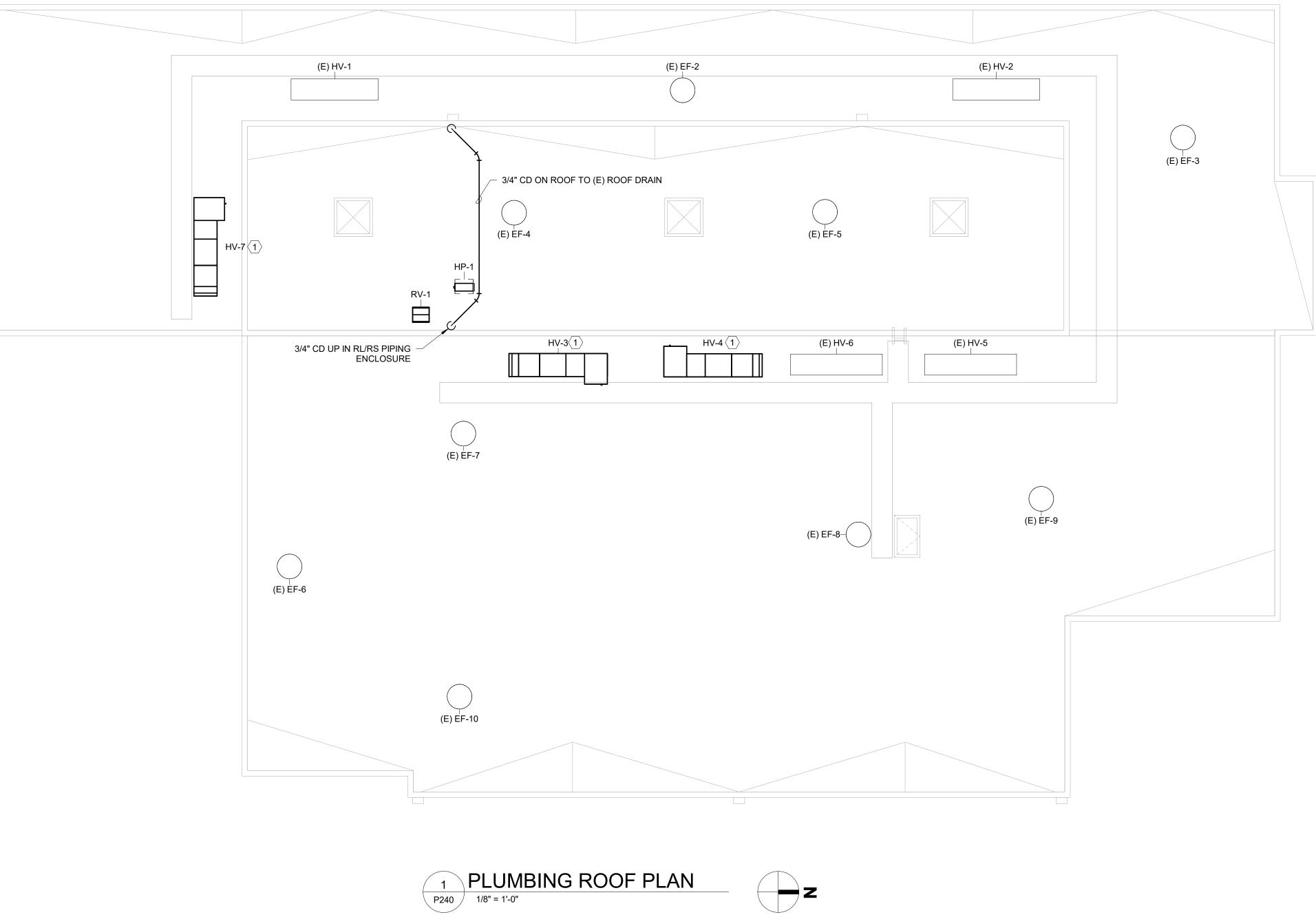
KEYED NOTES

- 1 EXISTING ROOFTOP HEATING VENTILATOR TO BE REPLACED IN KIND. REFER TO PANEL SCHEDULES FOR NEW ELECTRICAL LOADS. DISCONNECT EXISTING CONDUIT AND CONDUCTORS FROM EXISTING EQUIPMENT. REUSE EXISTING CONDUIT, CONDUCTORS, AND DISCONNECT SWITCH FOR CONNECTIONS TO NEW EQUIPMENT.
- 2 REUSE EXISTING CONDUIT AND CONDUCTORS. REMOVE EXTRA CONDUCTOR PREVIOUSLY USED TO POWER (D) AC-1.

2727 B	RONTI SULTING ENGI echelli Lane - Redding, 232-6160 - www.fro	CA 96002
DRAWING AR CONSULTING REPRODUCEI UNAUTHORIZ	DESIGNS, AND PLANS REPI E THE EXCLUSIVE PROPEF ENGINEERS, INC. AND SH D WITHOUT PRIOR WRITTEN ED REUSE OF THIS DRAWI HE PROJECT AND LOCATIO	RTY OF FRONTIER HALL NOT BE PERMISSION. AN' NG SHEET OTHER
	LICENSE STAMP	CAGINEEP
	KEY PLAN	
	PROJECT NAME	
HVA	C REPLACE	MENT
	DIONAL FAC 004 HARRISON AVE EUREKA, CA 9550	NUE
<u>NO.</u>	REVISIONS	DATE
ELEC	SHEET TITLE	F PLAN
		ON
	ISSUED FOR: ONSTRUCTI DOCUMENT	ON



+



FRONTIER CONSULTING ENGINEERS 2727 Bechelli Lane - Redding, CA 96002 Ph: (530) 232-6160 - www.frontierce.com	
ALL IDEAS, DESIGNS, AND PLANS REPRESENTED BY THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF FRONTIER CONSULTING ENGINEERS, INC. AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION. ANY UNAUTHORIZED REUSE OF THIS DRAWING SHEET OTHER THAN FOR THE PROJECT AND LOCATION SHOWN IS PROHIBITED.	
LICENSE STAMP	
20 PROFESSION P	
No. M41898	
OF CALLEONIN	
KEY PLAN	
PROJECT NAME	
HVAC REPLACEMENT	
FOR	
HUMBOLDT COUNTY REGIONAL FACILITY	
2004 HARRISON AVENUE EUREKA, CA 95501	
NO. REVISIONS DATE	
SHEET TITLE	
PLUMBING ROOF PLAN	
ISSUED FOR: CONSTRUCTION DOCUMENTS	
DATE: 9/20/2024 DRAWN BY: EG	
REVIEWED BY: NW SCALE: 1/8" = 1'-0" PROJECT NO: 22007	
P240	