ROOFTOP AHUs REMOVAL & REPLACEMENT
90 ROUNTREE WATSONVILLE, CA

PROJECT #21TI-036

Volume #02 Plans-Specifications-Scope- Photographs
CUPCCAA: Supporting Docs

COUNTY OF SANTA CRUZ, CALIFORNIA
GENERAL SERVICES DEPARTMENT
March 30, 2022

"VIRTUAL" **PRE-BID CONFERENCE (MANDATORY):**
Wednesday, April 6, 2022 – 10:00 A.M.

LOCATION:
Medium Security Correctional Facility
90 Rountree Ln.
Watsonville, CA 95076

PROPOSALS DUE:
Monday, April 25, 2022 – 2:30 P.M.

For use in connection with Santa Cruz County standards and the 2019 California Building Code.

TABLE OF CONTENTS

This CUPCCAA Project is supported by specific documents enumerated in the "Table of Contents" below:

A. Engineered Drawings
B. Technical Specifications
C. Supplemental Conditions
D. Existing Condition Photographs
E. Scope of Work
F. Preliminary Project Schedule
G. Progress Payment Application Template
H. Other Documents
    - 1990 Mechanical "As Build" Drawings
    - OFCI Equipment Engineering Performance Specifications
    - Engineering Report Existing Mechanical Equipment 07.22.21

Scope of Work:

The County, as a core milestone in the development and delivery of a project, did conduct a site assessment and in conjunction met with the occupants of the facility and/or space to discuss the needs, wants, and expectations. From this site meeting discussion, the **"scope of work"** was drafted and refined to aid the Bidder in understanding parameters of the project and establishing the Bid to execute the expected work.

Project Supplemental Conditions:

These are project clarifications that help the Contractor to gain comfort with the site conditions and support the project intent. The Supplemental Conditions are weighted equally in significance to that of the County General Conditions Terms & Conditions and project Specifications.

Existing Condition Photographs:

The County has provided existing condition photographs in advance of a site visit for the purpose of formulating questions to focus observations during the mandatory pre-bid site visit. This will better prepare the Contractor to identify, mitigate, and manage their risk as well that of the county.

Progress Payment Application:

The provided template does include some project basic information. This format shall be used by the contractor for the sole purpose of aiding in a swift and comprehensive review of contractor progress payments. Other supporting documents shall be provided. This does take the place of typical AIA G702 and G703 forms unless under most capital projects in which the Design Team requires usage of the typical AIA G702/703 form of requesting payments.

Other Documents:

Documents entered this section have information considered necessary to the Bidder. Documents that would be included are shop drawings, expected project schedule of values, reports, etc. The Bidder is encouraged to review ALL documents under this section of the Bid package.

ENGINEERED DRAWINGS

EXHIBIT “A”

SANTA CRUZ COUNTY – ROUNTREE FACILITY

ROOFTOP UNIT REPLACEMENT

90 ROUNTREE LANE
WATSONVILLE, CA. 95073

INDEX OF DRAWINGS

SCOPE

THIS PROJECT IS THE LIIMTED TO THE REPLACEMENT OF TWO (2) EXISTING HEATING AND VENTILATING HYDRONIC UNITS FOR THE INMATE HOLDING AREAS AT THE ROUNTREE DETENTION FACILITY.

CONTRACTOR SHALL PROVIDE COMPLETE AND OPERATIONAL HEAT PUMP UNITS WITH SUPPLEMENTAL HYDRONIC HEATING AND ALL REQUIRED ELECTRICAL WORK. CONTROL OF NEW EQUIPMENT SHALL BE PER SPECIFIED CONTROLS.

PROJECT INFORMATION

PROJECT: ROUNTREE FACILITY
ROOFTOP UNIT REPLACEMENT

LOCATION: 90 ROUNTREE LANE
WATSONVILLE, CA. 95073

LIST OF GOVERNING CODES:

2019 BUILDING STANDARDS ADMINISTRATIVE CODE, PART 1, TITLE 24, C.C.R.
2019 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24, C.C.R.
2019 CALIFORNIA ELECTRICAL CODE, PART 3, TITLE 24, C.C.R.
2019 CALIFORNIA MECHANICAL CODE (CMC), PART 4, TITLE 24, C.C.R.
2019 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24, C.C.R.
2019 CALIFORNIA ENERGY CODE (CEC), PART 6, TITLE 24, C.C.R.
2019 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24, C.C.R.
2019 CALIFORNIA GREEN BUILDING STANDARDS CODE, PART 11, TITLE 24, C.C.R.
2019 CALIFORNIA REFERENCED STANDARDS CODE, PART 12, TITLE 24, C.C.R.
TITLE 19, C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.

ALL SECTION NUMBERS BELOW REFER TO GROUP 1, CHAPTER 4, PART 1, TITLE 24, C.C.R.

1. ADDENDA, CONSTRUCTION CHANGES PER SECTION 4-338.
2. INSPECTOR APPROVED BY DSA. INSPECTOR AND CONTINUOUS INSPECTION OF WORK PER SECTION 4-333(b) AND 4-342.
3. TESTS AND TESTING LABORATORY PER SECTION 4-335.
4. SPECIAL INSPECTION PER SECTION 4-333(c).
5. CONTRACTOR SHALL SUBMIT VERIFIED REPORTS PER SECTION 4-336 AND 4-343(c).
6. ADMINISTRATION OF CONSTRUCTION PER PART 1, TITLE 24, C.C.R. - DUTIES OF ARCHITECT, STRUCTURAL ENGINEER OR PROFESSIONAL ENGINEER PER SECTION 4-333(a) AND 4-341.
7. GOVERNING CODES: TITLE 24.
8. A COPY OF PARTS 1, 2, 3, 4, AND 5 OF TITLE 24 SHALL BE KEPT AVAILABLE IN THE FIELD DURING CONSTRUCTION.
9. DSA SHALL BE NOTIFIED OF START OF CONSTRUCTION PER SECTION 4-331.
10. SUPERVISION BY THE DIVISION OF THE STATE ARCHITECT PER SECTION 4-334.

PROJECT DIRECTORY

MECHANICAL ENGINEER

AXIOM ENGINEERS, INC.
4601 WEST WALNUT ST, SUITE 1
SOQUEL, CA 95073
CONTACT: SEAN RING P.E.
PHONE: (831) 464-4320
FAX: (831) 464-4323
E-MAIL: seanr@axiomengineers.com

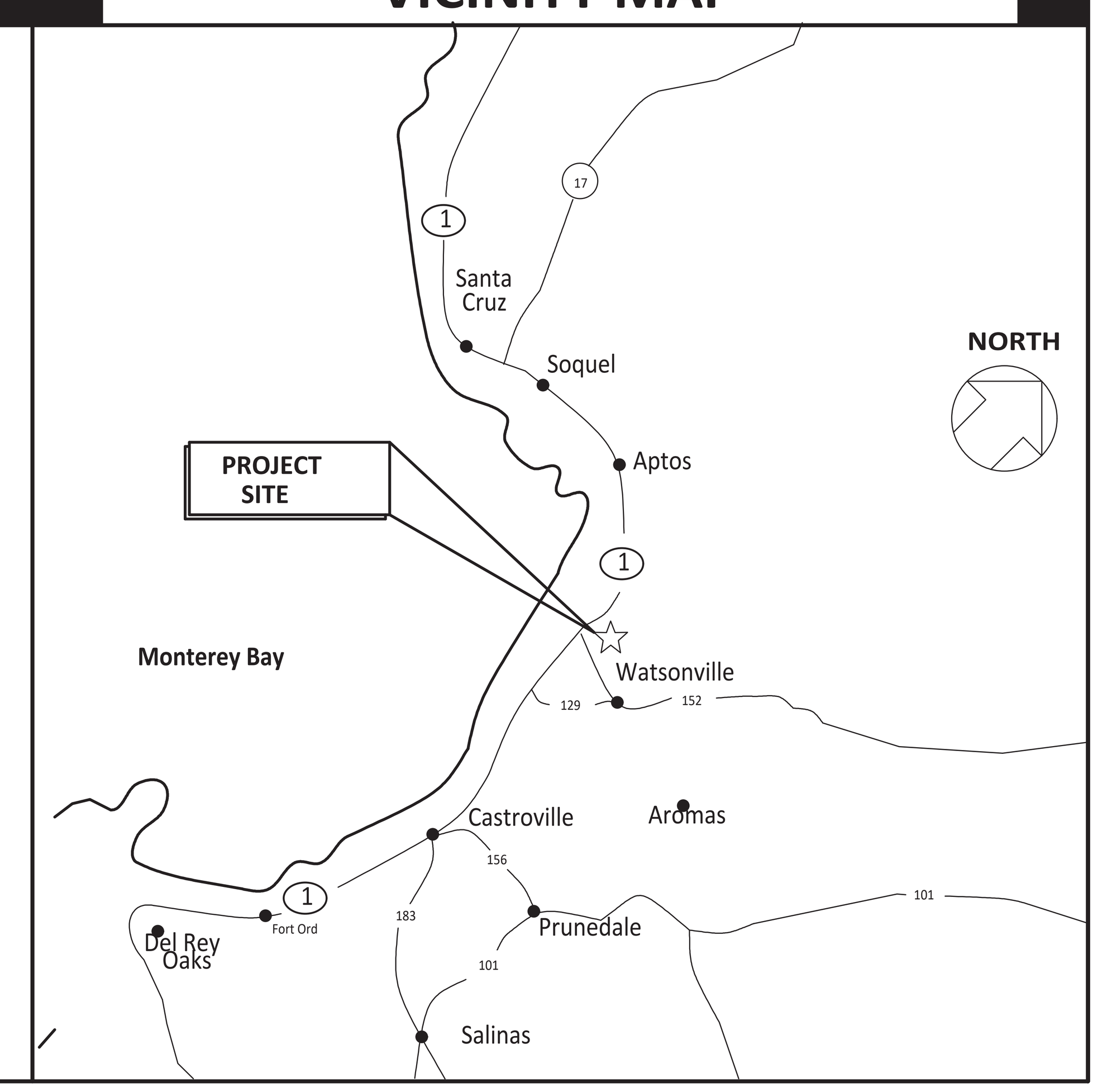
ELECTRICAL ENGINEER

AURUM CONSULTING ENGINEERS
60 GARDEN CT. STE 210
MONTEREY CA 9940
PHONE: (831) 646-3330
CONTACT:

REQUISITE OWNER COORDINATION

1. COORDINATE ALL SYSTEM (HEATING, CONTROLS, POWER, ETC.) SHUTDOWNS WITH COUNTY/SHERIFF REPRESENTATIVES. PROVIDE SHUTDOWN REQUESTS AT LEAST TEN (10) DAYS PRIOR TO SHUTDOWN
2. CONTRACTOR WITH ALL FACILITY SECURE ACCESS REQUIREMENTS WHILE ON SITE.

VICINITY MAP



REGISTERED PROFESSIONAL ENGINEER
SEAN L. RING
No. M33543
EXP. SEPT. 30, 2022
MECHANICAL
STATE OF CALIFORNIA

AXIOM ENGINEERS CONSULTING ENGINEERS
www.axiomengineers.com
AI Project # 20210099

ROUNDTREE FACILITY
ROOFTOP UNIT REPLACEMENT
SANTA CRUZ COUNTY
90 ROUNTREE LANE
WATSONVILLE, CA 95073

TITLE SHEET

DATE	11/15/21
SCALE	NONE
DRAWN	CADD
JOB	20210099
SHEET	T0.1

ROOFTOP HVAC HEAT PUMP UNITS

MARK	COOL MBH				HEAT MBH			CFM			DIMENSIONS L x W x H	SOUND POWER (dBA)	MOTOR			UNIT		WT LBS	EER	MAKE & MODEL	REMARKS
	OA TEMP	TC	SC	LA TEMP	OA TEMP	OUT	LA TEMP	TOTAL	ESP	OA			HP	BHP	V/PH	MCA	MOCP				
RTU-1	100°F	134	105	74°F	30°F	108	49°F	5,000	1.8" W.G.	5,000	116" x 64" x 58"	80.3	6.1	-	460/3	36.4	45	1,370	10.6	iAIRE (CARRIER SUBSIDIARY) UPC-TC14HKT000A00D-BFGVY9	(1)(2)(3)(4)
RTU-2	100°F	134	105	74°F	30°F	108	49°F	5,000	1.8" W.G.	5,000	116" x 64" x 58"	80.3	6.1	-	460/3	36.4	45	1,370	10.6	iAIRE (CARRIER SUBSIDIARY) UPC-TC14HKT000A00D-BFGVY9	(1)(2)(3)(4)

(1) PROVIDE ROOFTOP PACKAGED 12.5 TON HEAT PUMP HEATING & COOLING UNIT COMPLETE WITH MICRO METL (CONTACT: SETH LAYLON 775-332-0450) FACTORY ADAPTOR CURB (SELECTION TO BE FIELD VERIFIED PRIOR TO ORDERING), SCROLL COMPRESSORS WITH FULLY MODULATING HOT GAS REHEAT, FACTORY SET VARIABLE FREQUENCY DRIVE FAN, EVAPORATOR FREEZE CONTROL, 2" MERV 13 FILTERS, WHOLE UNIT CORROSION RESISTANT COATING (LUVATA TROPICOAT) FOR 5 YEAR COIL WARRANTY CONDITION, 2-POSITION OUTSIDE AIR DAMPER, LOW AMBIENT HEAD PRESSURE CONTROL, FACTORY STARTUP, & 100% OA UNIT DESIGN. INCLUDE UNIT WITH MISTOP FOGSTOP FOG ELIMINATOR ON OUTSIDE AIR INTAKE & RESETTABLE FACTORY DUCT SMOKE DETECTOR ON SUPPLY AIR OUTLET WIRED/PROGRAMMED TO SHUT DOWN UNIT UPON DETECTION OF SMOKE IN ACCORDANCE WITH 2019 CMC SECTION 608.

(2) OWNER FURNISHED CONTRACTOR INSTALLED. UNIT CONTROLLER SHALL BE BACnet COMPATIBLE FOR FUTURE BMS TIE-IN. SEE 1/M0.1 FOR CONTROLS & SEQUENCE OF OPERATION. CONTROLLER SHALL BE LOCATED PER OWNER DESIGNATED SPACE FOR FACILITY STAFF ACCESS ONLY.

(3) SEE 1/M0.1 FOR EQUIPMENT & CURB ADAPTOR ATTACHMENT REQUIREMENTS. CONFIRM ANCHORING REQUIREMENTS AFTER EQUIPMENT & CURB ADAPTOR SUBMITTAL APPROVAL.

ZONE HEATING COILS

MARK	EQUIPMENT SERVED	AIR SIDE				WATER SIDE				COIL SIZE			FINS/IN	Cv	2-WAY OR 3-WAY	MAKE & MODEL	REMARKS
		CFM	ESP	EDB°F	LDB°F	GPM	EWT°F	LWT°F	MAX PD	HIGH	WIDE	ROWS					
HC-1	RTU-1	5,000	0.19"	28	81	11.7	180	130.0	5.7 FT	36"	36"	2	8	8.3	2-WAY	CAPITAL COIL & AIR W8-3636-08B-4CA-R	(1)(2)
HC-2	RTU-2	5,000	0.19"	28	81	11.7	180	130.0	5.7 FT	36"	36"	2	8	8.3	2-WAY	CAPITAL COIL & AIR W8-3636-08B-4CA-R	(1)(2)

(1) PROVIDE NEW COIL WITH OUTDOOR RATED TWO WAY CONTROL VALVE (BELIMO OR EQUAL) & CONNECT TO EXISTING CENTRAL DDC WITH ALL PROGRAMMING & SEQUENCING FOR NEW ZONE. TEMPERATURE & SCHEDULE SEQUENCE TO MATCH EXISTING ZONES. SEE 4/M6.1 FOR COIL & HWS/HWR PIPING & CONNECTION REQUIREMENTS.

(2) PERFORM PREBALANCE SERVICES PRIOR TO STARTING WORK AND PROVIDE EXISTING HOT WATER FLOW MEASUREMENTS TO ENGINEER WITH A WRITTEN REPORT. ADJUST HOT WATER FLOW TO NEW VALUES. PREBALANCE & FINAL BALANCE REPORT SHALL PROVIDE HOT WATER FLOW MEASUREMENTS FOR THE FOLLOWING: TOTAL BOILER PLANT PRIMARY & SECONDARY SYSTEM, HV-1, HV-2, HV-3, HV-4, HV-5, HV-6, & HV-7.

EXHAUST FANS

MARK	LOCATION	CFM	ESP	SONES OR TIP SPEED	MOTOR		FAN RPM	WT LBS	MAKE MODEL	REMARKS
					HP	V/PH				
(E)EF-1	ROOF	1,300	0.4"	11.7	1/4	120/1	1,435	90	COOK ACE-B-120C38	(1)(2)
(E)EF-2	ROOF	250	0.4"	4.6	1/6	120/1	930	90	COOK ACE-B-120C28	(1)(2)
(E)EF-3	ROOF	250	0.4"	4.6	1/6	120/1	930	90	COOK ACE-B-120C28	(1)(2)
(E)EF-4	ROOF	1,300	0.4"	11.7	1/4	120/1	1,435	90	COOK ACE-B-120C38	(1)(2)
(E)EF-5	ROOF	5,000	0.4"	28	1.5	120/1	1,425	150	COOK ACE-B-180C88	(1)(2)
(E)EF-6	ROOF	5,000	0.4"	28	1.5	120/1	1,425	150	COOK ACE-B-180C88	(1)(2)

(1) PERFORM PREBALANCE SERVICES ON EXISTING FAN & ALL ASSOCIATED GRILLS. ASSESS FAN FOR ANY REQUIRED MAINTENANCE. PROVIDE WRITTEN REPORT FOR ENGINEER REVIEW WITH ANY RECOMMENDED MAINTENANCE ORE REPLACEMENT. REFER TO MECHANICAL AS-BUILT DRAWINGS AS REQUIRED.

(2) PERFORM FINAL AIR BALANCE SERVICES ON EXISTING FAN & ALL ASSOCIATED GRILLS. PROVIDE WRITTEN REPORT FOR ENGINEER REVIEW. REFER TO MECHANICAL AS-BUILT DRAWINGS AS REQUIRED.

SEQUENCE OF OPERATIONS:

REFER TO CONTROLS DIAGRAM BELOW FOR CONTROLS REQUIREMENTS.

ROOFTOP UNIT LOCAL CONTROLLER SHALL BE BACnet COMPATIBLE FOR FUTURE CONNECTION TO CENTRAL BMS .

UNIT SHALL BE INSTALLED WITH THE FOLLOWING CONTROLS POINTS:

BO - FAN START/STOP
AO - FAN SPEED (PER MANUAL SPEED CONTROL)
BO - HEAT PUMP COOLING STAGE 1
BO - HEAT PUMP COOLING STAGE 2
BO - HEAT PUMP HEATING
BO - HYDRONIC HOT WATER COIL OPEN/CLOSE
BI - SUPPLY AIR SMOKE DETECTOR
AI - SUPPLY AIR TEMPERATURE
AI - RETURN AIR TEMPERATURE
AI - OUTSIDE AIR TEMPERATURE
BI - SA FAN VFD STATUS
BI - SA FAN VFD SHUTDOWN (FAULT)

ROOFTOP UNIT SHALL RUN CONTINUOUSLY WITH A MANUAL STOP COMMAND AT CENTRAL CONTROLLER. CONTROLLER SHALL INDICATE "UNIT OFF" VISUAL ALARM WHEN UNIT IS OFF UNDER ANY CONDITION.

CENTRAL CONTROLLER SHALL MONITOR OUTSIDE, RETURN, & SUPPLY AIR TEMPERATURE AND SHALL CYCLE HEATING & COOLING PER ADJUSTABLE TEMPERATURE SETPOINTS.

HEATING:

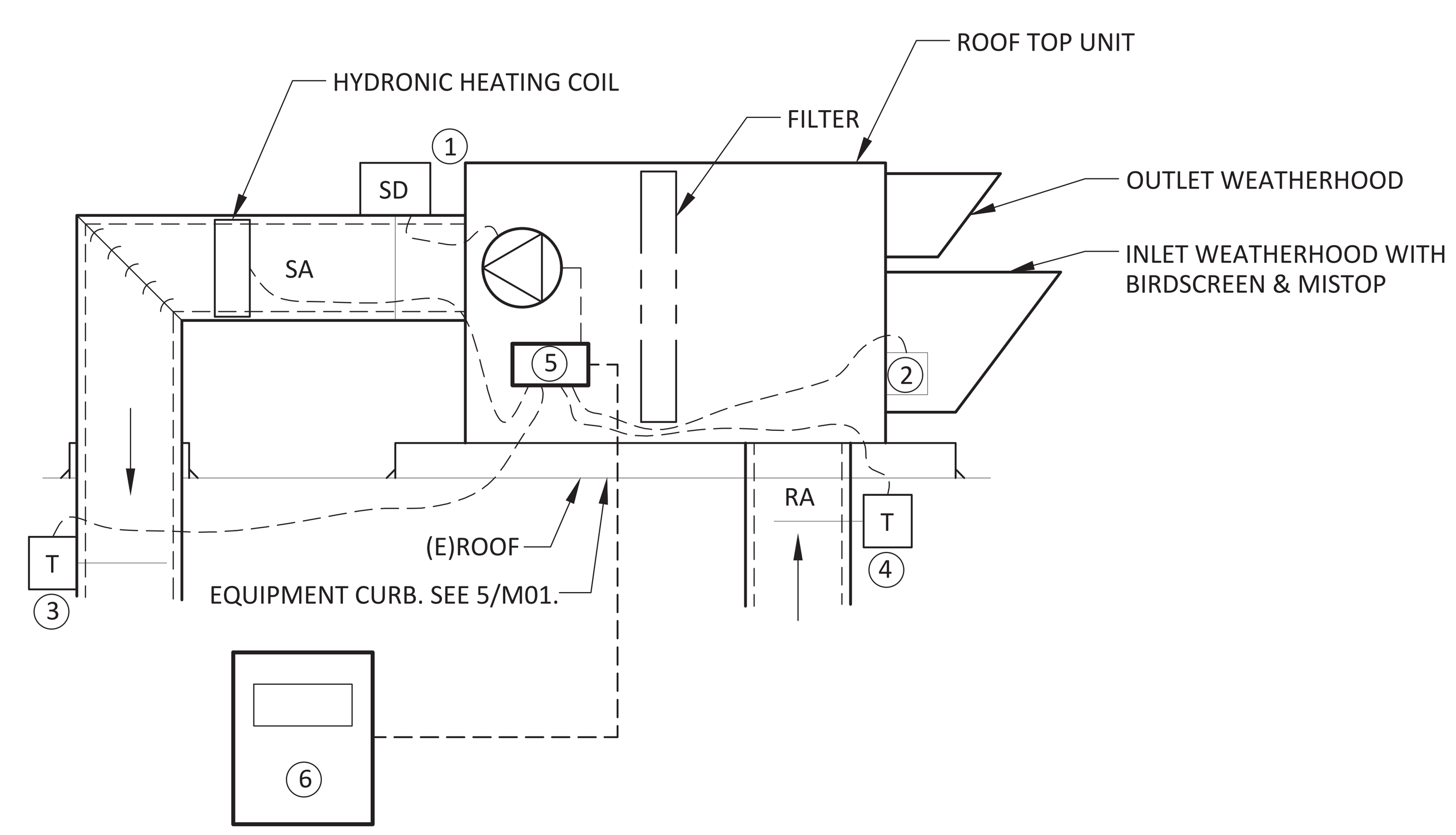
HEATING SHALL BE LOCKED OUT WHEN OUTSIDE AIR (OA TEMP) > 64°F (ADJ).
AT A RETURN AIR (RA TEMP) OF 68°F (ADJ), HEATING BY HEAT PUMP SHALL BE ENABLED.
ONCE ENABLED THE HEAT PUMP SHALL OPERATE FOR A MINIMUM INTERVAL OF 10 MINUTES & SHALL BE DISABLED AT A RETURN AIR (RA TEMP) OF 72°F (ADJ).

IF HEAT PUMP IS ENABLED AND SUPPLY AIR (SA TEMP) < 79°F (ADJ), HYDRONIC HEATING VALVE SHALL BE COMMANDED OPEN TO SUPPLEMENT THE HEAT PUMP.
HYDRONIC HEATING COIL SHALL BE COMMANDED CLOSED IF SUPPLY AIR (SA TEMP) > 105°F (ADJ) UPON A CALL FOR HEAT FOR HEAT PUMP OPERATION ONLY.

COOLING:

COOLING SHALL BE LOCKED OUT WHEN OUTSIDE AIR (OA TEMP) < 76°F (ADJ).
AT A RETURN AIR (RA TEMP) OF 74°F (ADJ), COOLING BY HEAT PUMP SHALL BE ENABLED.
ONCE ENABLED THE HEAT PUMP SHALL OPERATE FOR A MINIMUM INTERVAL OF 10 MINUTES & SHALL BE DISABLED AT A RETURN AIR (RA TEMP) OF 70°F (ADJ).

STAGED COOLING FUNCTION SHALL STAGE NORMALLY PER FACTORY PROGRAMMING.



NOTES:

(1) SMOKE DETECTOR TO SHUT DOWN MAU PER 2019 CMC SECTION 608.1

(2) OA TEMPERATURE SENSOR

(3) DUCT MOUNTED SA TEMPERATURE SENSOR FIELD VERIFY INSTALLATION POINT WITH OWNER.

(4) DUCT MOUNTED RA TEMPERATURE SENSOR FIELD VERIFY INSTALLATION POINT WITH OWNER.

(5) ROOFTOP UNIT LOCAL CONTROLLER.

(6) CENTRAL CONTROLLER. SEE SEQUENCE OF OPERATION FOR REQUIRED FUNCTIONS. FIELD VERIFY SECURE INDOOR LOCATION PER OWNER REQUIREMENTS FOR INSTALLATION.

1 / M0.1 ROOF TOP UNIT — CONTROLS
NO SCALE

GENERAL NOTES:

1. THIS PROJECT IS A REMODEL AND CONSTRUCTION WILL OCCUR IN PHASES SO FACILITY CAN REMAIN OPEN AND OPERATIONAL. THE PLANS AND SPECIFICATIONS INDICATE THE GENERAL EXTENT OF THE WORK BASED ON OWNER PROVIDED RECORD DRAWINGS AND LIMITED FIELD VERIFICATION. CONTRACTOR SHALL VISIT SITE, VERIFY EXISTING CONDITIONS, AND REPORT ANY DISCREPANCIES NOTED TO THE ARCHITECT PRIOR TO SUBMITTING A BID. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISCONNECTION AND RECONNECTION OF MECHANICAL, PLUMBING, AND ELECTRICAL SYSTEMS NECESSARY TO ACCOMPLISH THE WORK WHETHER OR NOT SPECIFIED AND/OR INDICATED.
2. ANY REQUIRED ASBESTOS ABATEMENT WORK WILL BE PROVIDED BY OTHERS. AREAS SUSPECTED OF ASBESTOS CONTAMINATION WHICH INTERFERE WITH WORK UNDER THIS PROJECT SHALL BE IDENTIFIED DURING THE EARLY PHASES OF CONSTRUCTION IN ORDER TO PROVIDE FOR TIMELY DISPOSITION. NO DELAYS IN CONSTRUCTION SCHEDULE WILL BE ALLOWED DUE TO IMPROPER COORDINATION.
3. MECHANICAL OR PLUMBING CONTRACTOR SHALL NOTIFY GENERAL CONTRACTOR TO REPAIR WALL, FLOOR, AND CEILING SURFACES AS REQUIRED DUE TO DEMOLITION OR INSTALLATION WORK.
4. REMOVE ALL ABANDONED PIPING, DUCT WORK, WIRING, EQUIPMENT, AND FIXTURES INTERFERING WITH NEW WORK OR THAT IS NOT CONCEALED BEHIND FINISHES WHETHER NEW WORK IS ARCHITECTURAL, STRUCTURAL, MECHANICAL, OR ELECTRICAL.
5. ABANDON IN PLACE BEHIND NEW FINISHES ALL PIPING, WIRING, AND DUCT WORK NOT INTERFERING WITH NEW WORK UNLESS REQUIRED FOR CONTINUED SERVICE.
6. CUTTING OR CORING OF STRUCTURAL MEMBERS OR FOOTINGS IS PROHIBITED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER AND THE ARCHITECT.
7. CONTRACTOR SHALL VERIFY THAT THE ELECTRICAL CONNECTIONS TO THE UNITS, INCLUDING CIRCUIT PROTECTION, CONFORM TO UNIT LABELS AND MANUFACTURER'S DIRECTIONS. WHERE WIRE SIZES SHOWN ON DRAWING EXCEED MANUFACTURER'S RECOMMENDATIONS, THE DRAWINGS SHALL GOVERN. ALL WIRING SHALL BE PER THE NATIONAL ELECTRICAL CODE. AS AMENDED AND ENFORCED BY JURISDICTIONAL AUTHORITY.
8. COORDINATE WITH ELECTRICAL ON REQUIRED POWER OUTLETS AND LIGHT SWITCHES NEAR PLUMBING EQUIPMENT.
9. ALL CONTROL WIRING SHALL BE IN CONDUIT. CONDUIT SHALL BE PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR. PROVIDE AND INSTALL RIGID CONDUIT IN AREAS EXPOSED TO THE ELEMENTS.
10. PROVIDE SHOP DRAWINGS OF ALL MECHANICAL LAYOUTS SHOWING EQUIPMENT, DUCTWORK, REGISTERS, PIPING, CONTROL DAMPERS, LIGHTS, ACCESS PANELS AND ACCESS SPACES, ETC.. OBTAIN AND COORDINATE WITH APPROVED FIRE SPRINKLER PLUMBING, ELECTRICAL, CASE WORK AND OTHER TRADES SHOP DRAWINGS PRIOR TO MECHANICAL DRAWING SUBMITTAL.
11. COORDINATE EXACT GRILLE, DIFFUSER AND ACCESS DOOR LAYOUT WITH LIGHTS AND SPRINKLERS.
12. PROVIDE STEEL DUCTS ABOVE RATED CEILINGS AND MINIMUM 18" BEYOND RATED WALLS.
13. SUPPORT DUCTS TIGHT BELOW STRUCTURE WHEREVER POSSIBLE.
14. COORDINATE WITH OWNER ON SPACE REQUIRED AND TIME SCHEDULE FOR DELIVERY OF ALL ITEMS WHICH ARE TO BE GIVEN TO THE OWNER FOR HIS DISPOSITION.
15. FOR ROOF PENETRATIONS WITHOUT CURBS, PROVIDE WEATHERPROOF FLASHING PER SMACNA ARCHITECTURAL SHEET METAL MANUAL AND DRAWING NOTES.
16. ALL TRANSITIONS IN DUCTWORK SHALL BE MADE AT 15 DEGREES MAXIMUM EACH FACE UNLESS OTHERWISE NOTED OR SPECIFICALLY APPROVED.
17. ALL DUCTWORK AND PIPING IS CONCEALED UNLESS OTHERWISE NOTED.
18. LABEL ALL PIECES OF EQUIPMENT WITH MARK MATCHING SCHEDULE OR EQUIPMENT LIST WITH ENGRAVED PLASTIC LABELS WITH MINIMUM 3" HIGH LETTERS. LABELS EXPOSED TO WEATHER SHALL BE ENGRAVED BRASS.
19. PRIME AND PAINT ALL EXPOSED DUCTWORK, PIPING, AND SUPPORTS PER ARCHITECTURAL SPECIFICATIONS. PAINT SHALL NOT EXCEED THE FOLLOWING VOLATILE ORGANIC COMPOUND CONTENT LIMITS: FLATS < 50 GRAMS PER LITER, NON-FLATS < 100 GRAMS PER LITER.
20. ALL DUCTS, REGISTERS, PIPING, VALVES, EQUIPMENT, ETC. SHOWN IS NEW UNLESS OTHERWISE NOTED.
21. ADHESIVES, SEALANTS AND CAULKS USED INDOORS SHALL NOT EXCEED THE FOLLOWING VOLATILE ORGANIC COMPOUND LIMITS PER TITLE 24, PART 11, SECTION 5.504.
    - METAL TO METAL < 30 GRAMS PER LITER
    - FIBERGLASS < 80 GRAMS PER LITER
    - CONTACT ADHESIVE < 80 GRAMS PER LITER
    - MASTICS < 100 GRAMS PER LITER
    - ZINC-RICH PRIMERS < 340 GRAMS PER LITER
    - FIRE RESISTANT COATINGS < 350 GRAMS PER LITER
22. HVAC EQUIPMENT SHALL NOT CONTAIN CFC'S OR HALONS PER TITLE 24, PART 11, SECTION 5.508.
23. AT THE TIME OF ROUGH INSTALLATION, OR DURING STORAGE ON THE CONSTRUCTION SITE AND UNTIL FINAL STARTUP OF THE HEATING AND COOLING EQUIPMENT, ALL DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENTS OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC OR SHEET METAL TO PROTECT THE AIR DISTRIBUTION SYSTEM FROM CONTAMINATION WITH DUST AND DEBRIS.

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HVAC LEGEND

SYMBOL	ABBRV.	IDENTIFICATION	ABBRV.	IDENTIFICATION
		AIR DUCT	HP	HORSEPOWER
	BD	BALANCING DAMPER	LBS	POUNDS
		AIR FROM DEVICE	MAX	MAXIMUM
		AIR TO DEVICE	MBH	1000 BTU PER HOUR
		SECTION THROUGH SUPPLY	MECH	MECHANICAL
		SECTION THROUGH RETURN	MFR	MANUFACTURER
		SECTION THROUGH EXHAUST	MIN	MINIMUM
T	TSTAT	THERMOSTAT	(N)	NEW
F/D	F/D	VERTICAL FIRE DAMPER	OA	OUTSIDE AIR
BT		BYPASS TIMER	OBD	OPPOSED BLADE DAMPER
	P.O.C.	POINT OF CONNECTION	OC	ON CENTER
	°F	DEGREES FAHRENHEIT	OD	OUTSIDE DIAMETER
	AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	OV	OUTLET VELOCITY
	ARCH	ARCHITECT/ARCHITECTURAL	PC	PLUMBING CONTRACTOR
	BLDG	BUILDING	PD	PRESSURE DROP
	BTUH	BRITISH THERMAL UNITS PER HOUR	PH	PHASE
	CFM	CUBIC FEET PER MINUTE	RA	RETURN AIR
	CLG	CEILING	RM	ROOM
	CONN	CONNECTION	RPM	REVOLUTIONS PER MINUTE
	CONT	CONTINUED, CONTINUATION	SA	SUPPLY AIR
	COORD	COORDINATE	SC	SENSIBLE COOLING
	DN	DOWN	TV	TURNING VANES
	DWGS	DRAWINGS	TYP	TYPICAL
	(E)	EXISTING	V	VOLT
	EER	ENERGY EFFICIENCY RATIO	W/	WITH
	ESP	EXTERNAL STATIC PRESSURE	WT	WEIGHT

CEILING DIFFUSER - ONE, TWO, THREE AND FOUR WAY THROW

12x12 CD (300) — REGISTER NECK SIZE AND MARK; DESIGN CFM; PANEL AT T-BAR CEILING

MECHANICAL SPECIFICATIONS

1. SCOPE: PROVIDE COMPLETE HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS, INCLUDING ALL LABOR, EQUIPMENT, MATERIALS AND SERVICES. PROVIDE EXHAUST FANS WHERE INDICATED.
2. COORDINATION: COORDINATE WITH GENERAL CONTRACTOR AND ALL OTHER TRADES.
3. CODES: THIS WORK SHALL CONFORM TO ALL LOCAL CODES, CALIFORNIA BUILDING CODE, CALIFORNIA MECHANICAL CODE AND CALIFORNIA PLUMBING CODE.
4. FEES: CONTRACTOR SHALL PAY ALL FEES IN CONNECTION WITH THIS WORK.
5. DRAWINGS: DRAWINGS ARE SCHEMATIC. ALL EQUIPMENT LOCATIONS SHALL BE VERIFIED IN THE FIELD AND APPROVED BY ARCHITECT.
6. CUTTING: REPAIR ALL SURFACES CUT IN THIS WORK TO MATCH ORIGINAL. NO CUTTING OF STRUCTURAL ELEMENTS IS ALLOWED WITHOUT PRIOR WRITTEN CONSENT OF THE STRUCTURAL ENGINEER.
7. MAINTENANCE: ALL EQUIPMENT SHALL BE ACCESSIBLE FOR MAINTENANCE.
8. GUARANTEE: ALL WORKMANSHIP, EQUIPMENT AND MATERIALS SHALL BE GUARANTEED FOR ONE YEAR AFTER DATE OF ACCEPTANCE.
9. CONTROLS: CONTRACTOR SHALL FURNISH ALL CONTROLS AND STARTERS FOR HIS EQUIPMENT. PROVIDE WIRING DIAGRAM FOR APPROVAL PRIOR TO INSTALLATION. ALL VAV BOXES AND EXHAUST FANS SHALL BE TIED INTO CENTRAL SIEMENS DDC SYSTEM AND CONFIGURED TO OPERATE IN ACCORDANCE WITH BUILDING SCHEDULE AND SETPOINT PARAMETERS.
10. BALANCING: NEBB CERTIFIED CONTRACTOR SHALL BALANCE THE AIR & HYDRONIC HOT WATER SYSTEM TO WITHIN 10% OF THE DESIGN QUANTITIES. PROVIDE WRITTEN REPORT FOR ENGINEER REVIEW AFTER INITIAL BALANCING. CONTRACTOR SHALL BE RESPONSIBLE FOR FINALIZING ANY ADJUSTMENTS & RECOMMENDATIONS PROVIDED BY THE ENGINEER AFTER REVIEWING REPORT. PROVIDE A FINAL REPORT FOR PROJECT RECORDS. WRITTEN REPORT SHALL INDICATE ALL MEASURING INSTRUMENTS AND CALIBRATION DATES. LIST ALL AIRFLOWS, HYDRONIC FLOWS, PRESSURES, AND ELECTRICAL PERFORMANCE OF EQUIPMENT AND DISTRIBUTION SYSTEMS IN PROJECT SCOPE.
11. DUCTWORK: NEW DUCTWORK SHALL COMPLY WITH 2019 CEC 120.4. DUCTWORK IN UNCONDITIONED OR OUTDOOR AREAS SHALL HAVE A MINIMUM R-8 INSULATION & WEATHERPROOF JACKETING/ROOFING MATERIAL COVER. PAINT ALL OUTDOOR DUCTWORK WITH 2 COATS OF RUSTOLEUM 9100 DTM OR EQUAL.IF NOT OTHERWISE JACKETED. DUCTWORK IN CONDITIONED SPACE SHALL HAVE A MINIMUM R-4.2 INSULATION. ALL DUCTWORK SHALL BE MINIMUM 20 GAUGE GALVANIZED G90 SHEET METAL AND IN ACCORDANCE WITH SMACNA MANUAL, AIRTIGHT AND SMOOTH, SECURELY FASTENED AND SUPPORTED. PRIMER AND PAINT ALL OUTDOOR DUCTWORK. NET INSIDE SIZES ARE SHOWN. 90 DEGREE ELBOWS SHALL HAVE TURNING VANES. DUCT LINING SHALL BE OWENS-CORNING "AEROFLEX" INSTALLED WITH CLIPS AND 100% COVERAGE OF ADHESIVE, ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
12. HYDRONIC PIPING:
    - A. HEATING HOT WATER PIPING: MUELLER STREAMLINE OR EQUAL HARD DRAWN COPPER WATER TUBE, CONFORMING TO ASTM B88 TYPE "L" ABOVE GROUND, WITH WROUGHT COPPER FITTINGS & SOLDERED JOINTS; SILPHOS SOLDER OR EQUAL.
    - B. PIPE INSULATION: INSULATE ALL HOT WATER PIPING WITH FIBERGLASS 1.5 INCH NOMINAL THICKNESS OWENS-CORNING TYPE ASJ STAPLED IN PLACE WITH VAPOR BARRIER OR EQUAL. ALL ELBOWS AND FITTINGS SHALL BE FACTORY PRE FABRICATED OUTDOOR RATED METAL JACKETED COVERS. ON ALL EXPOSED HOT WATER DROPS, COVER INSULATION WITH OUTDOOR RATED METAL JACKET AND SEAL PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE PIPING W/PRINTED LABELS & FLOW ARROWS, MINIMUM 3" TALL LETTERING.
    - C. HANGERS: SHALL BE OF ONE MANUFACTURER, MASON OR B-LINE AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. INSTALLATION SHALL ALSO CONFORM TO CALIFORNIA PLUMBING CODE. SUPPORT PIPING WHERE NECESSARY, AT SUFFICIENTLY CLOSE INTERVALS TO KEEP IT IN ALIGNMENT AND TO PREVENT SAGGING.
    - D. UNIONS: PROVIDE SCREWED UNIONS OR FLANGES IN LOCATIONS REQUIRED FOR THE DISCONNECTING AND CONNECTING OF ALL EQUIPMENT, TRAPS, BYPASSES AND FIXTURE TRAPS. MUELLER #C-107 IN COPPER PIPING; STOCKHAM FIG. 694 GALVANIZED MALLEABLE IRON, BRASS SEAT IN STEEL LINERS; WATTS DIELECTRIC UNIONS WHERE COPPER CONNECTS TO STEEL.
    - E. PIPE ISOLATION: B-LINE, UNISTRUT, TOLCO, ISAT OR APPROVED EQUAL ISOLATORS.
    - F. CHECK VALVES: WATTS OR EQUAL, 150 LB CLASS, BRONZE BODY & DISC, HORIZONTAL SWING CHECK, SCREWED CAP & THREADED ENDS.
    - G. CIRCUIT SETTERS: BELL & GOSSETT CIRCUIT SETTER PLUS OR FLANGED BALL VALVE TYPE FOR $\frac{1}{2}$" THRU 4" PIPE SIZES.
    - H. BALL VALVES: PROVIDE NIBCO MODEL T-585-80 LEAD FREE BRONZE BODY, FULL PORT, BALL VALVES FOR $\frac{1}{2}$" THRU 2" PIPE SIZES.
    - I. STRAINER: WATTS SERIES 77F-D-125 OR EQUAL FLANGED WYE PATTERN CAST IRON STRAINER WITH 304 STAINLESS STEEL PERFORATED SCREEN WITH DRAIN/BLOWOFF CONNECTION FURNISHED WITH A CLOSURE PLUG.
    - J. INSTRUMENTATION:

      THERMOMETERS: ADJUSTABLE ANGLE TYPE, MERCURY IN GLASS, UNION CONNECTION AND BRASS SEPARABLE SOCKET. 30°F TO 240°F RANGE, 1-DEGREE DIVISIONS. H.O. TRERICE OR APPROVED EQUAL.

      PRESSURE GAUGES: GRADE 2A, ACCURATE WITHIN 1/2% OF SCALE RANGE, BOURDON TUBE SPRING TYPE WITH 4 1/2" DIAL WITH RECALIBRATING SCREWS. EACH GAUGE INSTALLED WITH NECESSARY PIPING, INCLUDING NECESSARY SHUT-OFF NEEDLE VALVE AND PRESSURE SNUBBER, AS REQUIRED. H.O. TRERICE OR APPROVED EQUAL.

14. SUBMITTALS: WITHIN 15 DAYS OF SIGNING A CONTRACT, PROVIDE SUBMITTALS ON ALL EQUIPMENT AND AIR DISTRIBUTION COMPONENTS.
15. STRUCTURAL: CONTRACTOR SHALL CONSULT AND OBTAIN DIRECTION OF THE STRUCTURAL ENGINEER ON STRUCTURAL SUPPORT OF ALL MECHANICAL EQUIPMENT.

LIST OF GOVERNING CODES:

2019 BUILDING STANDARDS ADMINISTRATIVE CODE, PART 1, TITLE 24, C.C.R.
2019 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24, C.C.R.
2019 CALIFORNIA ELECTRICAL CODE, PART 3, TITLE 24, C.C.R.
2019 CALIFORNIA MECHANICAL CODE (CMC), PART 4, TITLE 24, C.C.R.
2019 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24, C.C.R.
2019 CALIFORNIA ENERGY CODE (CEC), PART 6, TITLE 24, C.C.R.
2019 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24, C.C.R.
2019 CALIFORNIA GREEN BUILDING STANDARDS CODE, PART 11, TITLE 24, C.C.R.
2019 CALIFORNIA REFERENCED STANDARDS CODE, PART 12, TITLE 24, C.C.R.
TITLE 19, C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.

ALL SECTION NUMBERS BELOW REFER TO GROUP 1, CHAPTER 4, PART 1, TITLE 24, C.C.R.
1. ADDENDA, CONSTRUCTION CHANGES PER SECTION 4-338.
2. TESTS AND TESTING LABORATORY PER SECTION 4-335.
3. SPECIAL INSPECTION PER SECTION 4-333(c).
4. CONTRACTOR SHALL SUBMIT VERIFIED REPORTS PER SECTION 4-336 AND 4-343(c).
5. ADMINISTRATION OF CONSTRUCTION PER PART 1, TITLE 24, C.C.R. - DUTIES OF ARCHITECT, STRUCTURAL ENGINEER OR PROFESSIONAL ENGINEER PER SECTION 4-333(a) AND 4-341.
6. GOVERNING CODES: TITLE 24.
7. A COPY OF PARTS 1, 2, 3, 4, AND 5 OF TITLE 24 SHALL BE KEPT AVAILABLE IN THE FIELD DURING CONSTRUCTION.

REVISIONS | DATE

REGISTERED PROFESSIONAL ENGINEER SEAN L. RING No. M33543 EXP. SEPT. 30, 2022 MECHANICAL STATE OF CALIFORNIA

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AE Project # 20210099

ROUNDTREE FACILITY
ROOFTOP UNIT REPLACEMENT
SANTA CRUZ COUNTY
90 ROUNDTREE LANE
WATSONVILLE, CA 95073

LEGEND, SCHEDULES AND NOTES - MECHANICAL

DATE 11/15/21
SCALE NONE
DRAWN CADD
JOB 20210099
SHEET M0.1

CERTIFICATE OF COMPLIANCE NRCC-MCH-E

This document is used to demonstrate compliance for mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.4, or §141.0(b)2 for alterations.

Project Name:	90 Rountree Facility Rooftop Unit Replacement	Report Page:	Page 1 of 11
Project Address:	90 Rountree Lane, Watsonville CA 95073	Date Prepared:	11/23/2021

A. GENERAL INFORMATION

01	Project Location (city)	Watsonville	04	Total Conditioned Floor Area	31,760
02	Climate Zone	3	05	Total Unconditioned Floor Area	3,320
03	Occupancy Types Within Project:		06	# of Stories (Habitable Above Grade)	2

☐ Office (B)	☐ Retail (M)	☐ Non-refrigerated Warehouse (S)
☐ Hotel/ Motel Guest Rooms (R-1)	☐ School (E)	☐ Healthcare Facility (I)
☐ High-Rise Residential (R-2/R-3)	☐ Relocatable Class Bldg (E)	☑ Other (Write In): Correctional Facility

[1] *FOOTNOTES: Climate zone can be determined on the California Energy Commission's website at http://www.energy.ca.gov/maps/renewable/building_climate_zones.html*

B. PROJECT SCOPE

Table Instructions: Include any mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.4, or §141.0(b)2 for alterations.

My project consists of (check all that apply)

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

C. COMPLIANCE RESULTS

Table Instructions: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

01		02		03		04		05		06		07		08	09
System Summary §110.1, §110.2, §140.4	AND	Pumps §140.4(k)	AND	Fans/ Economizers §140.4(c), §140.4(e)	AND	System Controls §110.2, §120.2, §140.4(f)	AND	Ventilation §120.1	AND	Terminal Box Controls §140.4(d)	AND	Distribution §120.3, §140.4(l)	AND	Cooling Towers §110.2(e)2	Compliance Results
(See Table F)		(See Table G)		(See Table H)		(See Table I)		(See Table J)		(See Table K)		(See Table L)		(See Table M)	
No	AND		AND	Yes	AND	Yes	AND		AND		AND	Yes	AND		**DOES NOT COMPLY**
														Mandatory Measures Compliance (See Table Q for Details)	**COMPLIES**

CERTIFICATE OF COMPLIANCE NRCC-MCH-E

Project Name:	90 Rountree Facility Rooftop Unit Replacement	Report Page:	Page 2 of 11
Project Address:	90 Rountree Lane, Watsonville CA 95073	Date Prepared:	11/23/2021

D. EXCEPTIONAL CONDITIONS

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

Please review Table F for compliance: all fields which are not grey must be completed; design or rated efficiency must be greater than or equal to the minimum efficiency required.
Selections made in Table O have been changed by the permit applicant. See Table E. Additional Remarks for permit applicant's explanation.

E. ADDITIONAL REMARKS

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

F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)

Table Instructions: Complete the following equipment schedules to show compliance with mandatory requirements found in §110.1 and §110.2(a) and prescriptive requirements found in §140.4(a), §140.4(b) and §140.4(k) or §141.0(b)2 for alterations.

Dry System Equipment Sizing (includes air conditioners, condensers, heat pumps, VRF, furnaces and unit heaters)

01	02	03	04	05	06	07	08	09	10	11
				Equipment Sizing per Mechanical Schedule (kBtu/h) §140.4 (a&b)						
				Heating Output[2,3]			Cooling Output[2,3]		Load Calculations[3,4]	
Name or Item Tag	Equipment Category per Tables 110.2	Equipment Type per Tables 110.2 & Title 20	Smallest Size Available[1] §140.4(a)	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)
RTU-1	Unitary heat pumps (no elec. resistance)	Air cooled, package (3 phase)	Yes	134	142	129	135	150	134	105
RTU-2	Unitary heat pumps (no elec. resistance)	Air cooled, package (3 phase)	Yes	134	142	129	135	150	134	105

[1] *FOOTNOTES: Equipment shall be the smallest size, within the available options of the desired equipment line, necessary to meet the design heating and cooling loads of the building per §140.4(a). Healthcare facilities are excepted.*
[2] *It is common practice to show rated output capacity on the equipment schedule. Sensible cooling output comes from specification sheet tables.*
[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).*

Table Continued

CERTIFICATE OF COMPLIANCE NRCC-MCH-E

Project Name:	90 Rountree Facility Rooftop Unit Replacement	Report Page:	Page 3 of 11
Project Address:	90 Rountree Lane, Watsonville CA 95073	Date Prepared:	11/23/2021

Dry System Equipment Efficiency (other than Package Terminal Air Conditioners (PTAC) and Package Terminal Heat Pumps (PTHP))

01	02	03	04	05	06	07	08	09
		Heating Mode				Cooling Mode		
Name or Item Tag	Size Category (Btu/h)	Rating Condition (°F)	Efficiency Unit	Min Efficiency Required per Tables 110.2/ Title 20	Design Efficiency	Efficiency Unit	Min Efficiency Required per Tables 110.2/ Title 20	Design Efficiency
RTU-1	≥65,000 and <135,000	47°Fdb/43°Fwb OSA	COP	3.3	3.3	EER	10.8	10.6
						IEER	12	10.7
RTU-2	≥65,000 and <135,000	47°Fdb/43°Fwb OSA	COP	3.3	3.3	EER	10.8	10.6
						IEER	12	10.7

G. PUMPS

This Section Does Not Apply

H. FAN SYSTEMS & AIR ECONOMIZERS

Table Instructions: Complete the following Table for fan systems to demonstrate compliance with prescriptive requirements found in §140.4(c), §140.4(e) and §140.4(m). First document the system details, then add fans within that system to document compliance with fan power requirements. Fan systems serving only process loads are exempt from these requirements and do not need to be included in Table H.

System Name:	RTU-1	**Economizer:**[1]	NA: System operates @ 100% OSA	**Economizer Controls:**		**System Fan Type:**	Variable Air Volume
01	02	03	04	05	06	07	08
						Fan Power Pressure Drop Adjustment - Table 140.4-B	
Fan Name or Item Tag	Fan Function	Qty	Maximum Design Supply Airflow (CFM)	HP Unit[2]	Design HP	Device	Design Airflow through Device (CFM)
RTU-1	Supply	1	5,000	Nameplate HP	6.1		
						Calculated Adjustment (in H_2O)	

Total System Design Supply Airflow (CFM):	5,000	Total System Design (B)HP:	6.1	**Maximum System Fan Power (B)HP:**	7.5

Table Continued

CERTIFICATE OF COMPLIANCE NRCC-MCH-E

Project Name:	90 Rountree Facility Rooftop Unit Replacement	Report Page:	Page 4 of 11
Project Address:	90 Rountree Lane, Watsonville CA 95073	Date Prepared:	11/23/2021

System Name:	RTU-2	**Economizer:**[1]	NA: System operates @ 100% OSA	**Economizer Controls:**		**System Fan Type:**	Variable Air Volume
01	02	03	04	05	06	07	08
						Fan Power Pressure Drop Adjustment - Table 140.4-B	
Fan Name or Item Tag	Fan Function	Qty	Maximum Design Supply Airflow (CFM)	HP Unit[2]	Design HP	Device	Design Airflow through Device (CFM)
RTU-2	Supply	1	5,000	Nameplate HP	6.1		
						Calculated Adjustment (in H_2O)	

Total System Design Supply Airflow (CFM):	5,000	Total System Design (B)HP:	6.1	**Maximum System Fan Power (B)HP:**	7.5

[1] *FOOTNOTE: Computer room economizers must meet requirements of §140.9(a) and will be documented on the NRCC-PRC-E document.*
[2] *The unit used for HP must be consistent for all fans within a system.*

I. SYSTEM CONTROLS

Table Instructions: Complete the following Table to demonstrate compliance with mandatory controls in §110.2 and §120.2 and prescriptive controls in §140.4(f) and (n) or requirements in §141.0(b)2E for altered space conditioning systems.

01	02	03	04	05	06	07	08	09
System Name	System Zoning	Conditioned Floor Area Being Served (ft²)	Thermostats §110.2(b) & (c)[1], §120.2(a) or §141.0(b)2E	Shut-Off Controls §120.2(e)	Isolation Zone Controls §120.2(g)	Demand Response §110.12 and §120.2(b)	Supply Air Temp. Reset §140.4(f)	Window Interlocks per §140.4(n)
RTU-1	single zone	≤ 25,000 ft²	EMCS	Other*	NA: Single Zone	NA: PTAC, PTHP, Rm AC, HP	NA: Single Zone	NA: No operable windows
RTU-2	single zone	≤ 25,000 ft²	EMCS	Other*	NA: Single Zone	NA: PTAC, PTHP, Rm AC, HP	NA: Single Zone	NA: No operable windows

[1] *FOOTNOTES: Gravity gas wall heaters, gravity floor heaters, gravity room heaters, non-central electric heaters, fireplaces or decorative gas appliances, wood stoves are not required to have setback thermostats.*
* *NOTES: Controls with a * require a note in the space below explaining how compliance is achieved.*
EX: System 1: SA Temp Reset: Exempt because zones compliant with §140.4(d); EXCEPTION 1 to §140.4(f)

Table Continued

CERTIFICATE OF COMPLIANCE NRCC-MCH-E

Project Name:	90 Rountree Facility Rooftop Unit Replacement	Report Page:	Page 5 of 11
Project Address:	90 Rountree Lane, Watsonville CA 95073	Date Prepared:	11/23/2021

01	02	03	04	05	06	07	08	09
System Name	System Zoning	Conditioned Floor Area Being Served (ft²)	Thermostats §110.2(b) & (c)[1], §120.2(a) or §141.0(b)2E	Shut-Off Controls §120.2(e)	Isolation Zone Controls §120.2(g)	Demand Response §110.12 and §120.2(b)	Supply Air Temp. Reset §140.4(f)	Window Interlocks per §140.4(n)
RTU-1	Unit operates 24 hr - 7 day continuously to serve inmate detention areas. Shut off controls available to facility staff.							
RTU-2	Unit operates 24 hr - 7 day continuously to serve inmate detention areas. Shut off controls available to facility staff.							

J. VENTILATION AND INDOOR AIR QUALITY

This Section Does Not Apply

K. TERMINAL BOX CONTROLS

This Section Does Not Apply

L. DISTRIBUTION (DUCTWORK AND PIPING)

Table Instructions: Complete the following tables to show compliance with mandatory pipe insulation requirements found in §120.3 and prescriptive requirements found in §140.4(l) for duct leakage testing.

Duct Leakage Sealing

The answers to the questions below apply to the following duct system(s):		RTU-1 & RTU-2	Duct leakage testing triggered for these systems?	No
11	No	The scope of the project includes only duct systems serving healthcare facilites.		
12	Yes	Duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system.		
13	Yes	The space conditioning system serves less than 5,000 ft² of conditioned floor area.		
14	No	The combined surface area of the ducts in the following locations is more than 25% of the total surface area of the entire duct system:		
		☐ Outdoors		
		☐ In a space directly under a roof that has a U-factor greater than the U-factor of the ceiling, or if the roof does not meet the requirements of §140.3(a)1B or if the roof has fixed vents or openings to the outside/ unconditioned spaces		
		☐ In an unconditioned crawlspace		
		☐ In other unconditioned spaces		
15	No	The scope of the project includes extending an existing duct system, which is constructed, insulated or sealed with asbestos.		
16	No	The scope of the project includes an existing duct system that is documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in the Reference Nonresidential Appendix NA2.		
17		Duct system shall be sealed in accordance with the California Mechanical Code.		

Table Continued

CERTIFICATE OF COMPLIANCE NRCC-MCH-E

Project Name:	90 Rountree Facility Rooftop Unit Replacement	Report Page:	Page 6 of 11
Project Address:	90 Rountree Lane, Watsonville CA 95073	Date Prepared:	11/23/2021

Table Continued

M. COOLING TOWERS

This Section Does Not Apply

N. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

YES	NO	Form/Title	Systems To Be Field Verified	Field Inspector Pass	Field Inspector Fail
●		NRCI-MCH-01-E - Must be submitted for all buildings.	RTU-1, RTU-2	☐	☐

CERTIFICATE OF COMPLIANCE NRCC-MCH-E

Project Name:	90 Rountree Facility Rooftop Unit Replacement	Report Page:	Page 7 of 11
Project Address:	90 Rountree Lane, Watsonville CA 95073	Date Prepared:	11/23/2021

O. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCA/

YES	NO	Form/Title	Systems To Be Field Verified	Field Inspector Pass	Field Inspector Fail
○	●	NRCA-MCH-02-A Outdoor Air must be submitted for all newly installed HVAC units. *Note: MCH02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap.*		☐	☐
●	○	NRCA-MCH-03-A Constant Volume Single Zone HVAC *NOTE: This form does not automatically move to "Yes". If Constant Volume Single Zone HVAC Systems are included in the scope, permit applicant should move this form to "Yes".*		☐	☐
○	●	NRCA-MCH-04-A Air Distribution Duct Leakage		☐	☐
○	●	NRCA-MCH-05-A Air Economizer Controls		☐	☐
○	●	NRCA-MCH-06-A Demand Control Ventilation Systems Acceptance must be submitted for all systems required to employ demand controlled ventilation (refer to §120.1(c)3) can vary outside ventilation flow rates based on maintaining interior carbon dioxide (CO2) concentration setpoints.		☐	☐
○	●	NRCA-MCH-07-A Supply Fan Variable Flow Controls		☐	☐
○	●	NRCA-MCH-08-A Valve Leakage Test		☐	☐
○	●	NRCA-MCH-09-A Supply Water Temperature Reset Controls		☐	☐
○	●	NRCA-MCH-10-A Hydronic System Variable Flow Controls		☐	☐
○	●	NRCA-MCH-11-A Automatic Demand Shed Controls		☐	☐

CERTIFICATE OF COMPLIANCE NRCC-MCH-E

Project Name:	90 Rountree Facility Rooftop Unit Replacement	Report Page:	Page 8 of 11
Project Address:	90 Rountree Lane, Watsonville CA 95073	Date Prepared:	11/23/2021

○	●	NRCA-MCH-12-A FDD for Packaged Direct Expansion Units		☐	☐
○	●	NRCA-MCH-13-A Automatic FDD for Air Handling Units and Zone Terminal Units Acceptance		☐	☐
○	●	NRCA-MCH-14-A Distributed Energy Storage DX AC Systems Acceptance *NOTE: This form does not automatically move to "Yes". If Distributed Energy Storage DX AC Systems are included in the scope, permit applicant should move this form to "Yes".*		☐	☐
○	●	NRCA-MCH-15-A Thermal Energy Storage (TES) System Acceptance *NOTE: This form does not automatically move to "Yes". If Chilled Water Storage, Ice-on-Coil Internal Melt, Ice-on-Coil External Melt, Ice Harvester, Brine, Ice-Slurry, Eutectic Salt, Clathrate Hydrate Slurry (CHS), Cryogenic or Encapulated (Ice Ball) Systems are included in the scope, permit applicant should move this form to "Yes".*		☐	☐
○	●	NRCA-MCH-16-A Supply Air Temperature Reset Controls		☐	☐
○	●	NRCA-MCH-17-A Condenser Water Temperature Reset Controls		☐	☐
●	○	NRCA-MCH-18 Energy Management Control Systems		☐	☐
○	●	NRCA-MCH-19 Occupancy Sensor Controls		☐	☐
○	●	NRCA-MCH-20 Multi-Family Ventilation		☐	☐
○	●	NRCA-MCH-21 Multi-Family Envelope Leakage		☐	☐

CERTIFICATE OF COMPLIANCE NRCC-MCH-E

Project Name:	90 Rountree Facility Rooftop Unit Replacement	Report Page:	Page 9 of 11
Project Address:	90 Rountree Lane, Watsonville CA 95073	Date Prepared:	11/23/2021

P. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be completed by a HERS Rater and provided to the building inspector during construction. The final documents must be created by a HERS Providers registry, but drafts can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCV/

YES	NO	Form/Title	Field Inspector Pass	Field Inspector Fail
○	●	NRCV-MCH-04-H Duct Leakage Test *NOTE: Must be completed by a HERS Rater*	☐	☐
○	●	NRCV-MCH-24 Enclosure Air Leakage Worksheet *NOTE: Must be completed by a HERS Rater*	☐	☐
○	●	NRCV-MCH-27 High-rise Residential *NOTE: Must be completed by a HERS Rater*	☐	☐
○	●	NRCV-MCH-32 Local Mechanical Exhaust *NOTE: Must be completed by a HERS Rater*	☐	☐

REVISIONS	DATE

REGISTERED PROFESSIONAL ENGINEER SEAN L. RING No. M33543 EXP. SEPT. 30, 2022 MECHANICAL STATE OF CALIFORNIA

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AE Project #: 20210099

ROUNDTREE FACILITY
ROOFTOP UNIT REPLACEMENT

SANTA CRUZ COUNTY
90 ROUNDTREE LANE
WATSONVILLE, CA 95073

TITLE 24 - MECHANICAL

DATE	11/15/21
SCALE	NONE
DRAWN	CADD
JOB	20210099
SHEET	**M0.2**

STATE OF CALIFORNIA

Mechanical Systems

NRCC-MCH-E (Created 09/2020) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: 90 Rountree Facility Rooftop Unit Replacement	Report Page:	Page 10 of 11
Project Address: 90 Rountree Lane, Watsonville CA 95073	Date Prepared:	11/23/2021

Q. MANDATORY MEASURES DOCUMENTATION LOCATION

Table Instructions: Indicate where mandatory measures are documented in the plan set or construction documentation. For any mandatory measures that do not apply, mark the plan sheet or construction document location as "N/A", any active cells that are left blank will result in non-compliance in Table C.

01		02
		Plan sheet or construction document location
Compliance with Mandatory Measures documented through MCH Mandatory Measures Note Block:	No	

03	04
Mandatory Measure	Plan sheet or construction document location
Heating Equipment Efficiency per §110.1	M0.1
Cooling Equipment Efficiency per §110.1	M0.1
Furnace Standby Loss Control per §110.2(d)	N/A
Duct Insulation per §120.4	M0.1
Heating Hot Water Equipment Efficiency per §110.1	N/A
Cooling Chilled and Condenser Water Equipment Efficiency per §110.1	N/A
Open and Closed Circuit Cooling Towers conductivity of flow-based controls per §110.2(e)1	N/A
Open and Closed Circuit Cooling Towers Flow Meter with analog output per §110.2(e)3	N/A
Open and Closed Circuit Cooling Towers Overflow Alarm per §110.2(e)4	N/A
Open and Closed Circuit Cooling Towers Efficient Drift Eliminators per §110.2(e)5	N/A
Pipe Insulation per §120.3(b)	M0.1
Combustion air shutoff, combustion air fan controls and stack design and controls for boilers per §120.9	N/A
Heat Pump with Supplementary Electric Resistance Heater Controls per §110.2(b)	N/A
The air duct and plenum system is designed per §120.4(a)-(f)	N/A
Kitchen range hoods shall be rated for sound in accordance with Section 7.2 of ASHRAE 62.2	N/A

STATE OF CALIFORNIA

Mechanical Systems

NRCC-MCH-E (Created) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: 90 Rountree Facility Rooftop Unit Replacement	Report Page:	Page 11 of 11
Project Address: 90 Rountree Lane, Watsonville CA 95073	Date Prepared:	11/23/2021

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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

Documentation Author Name:	Sean Ring	Documentation Author Signature:	
Company:	Axiom Engineers, Inc.	Signature Date:	11/23/2021
Address:	303 Potrero St.	CEA/ HERS Certification Identification (if applicable):	
City/State/Zip:	Santa Cruz, CA 95060	Phone:	(831)464-4320

RESPONSIBLE PERSON'S DECLARATION STATEMENT

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

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

Responsible Designer Name:	Sean Ring	Responsible Designer Signature:	
Company :	Axiom Engineers, Inc.	Date Signed:	11/23/2021
Address:	303 Potrero St.	License:	M33543
City/State/Zip:	Santa Cruz, CA 95060	Phone:	(831)464-4320

REVISIONS	DATE

REGISTERED PROFESSIONAL ENGINEER
SEAN L. RING
No. M33543
EXP. SEPT. 30, 2022
MECHANICAL
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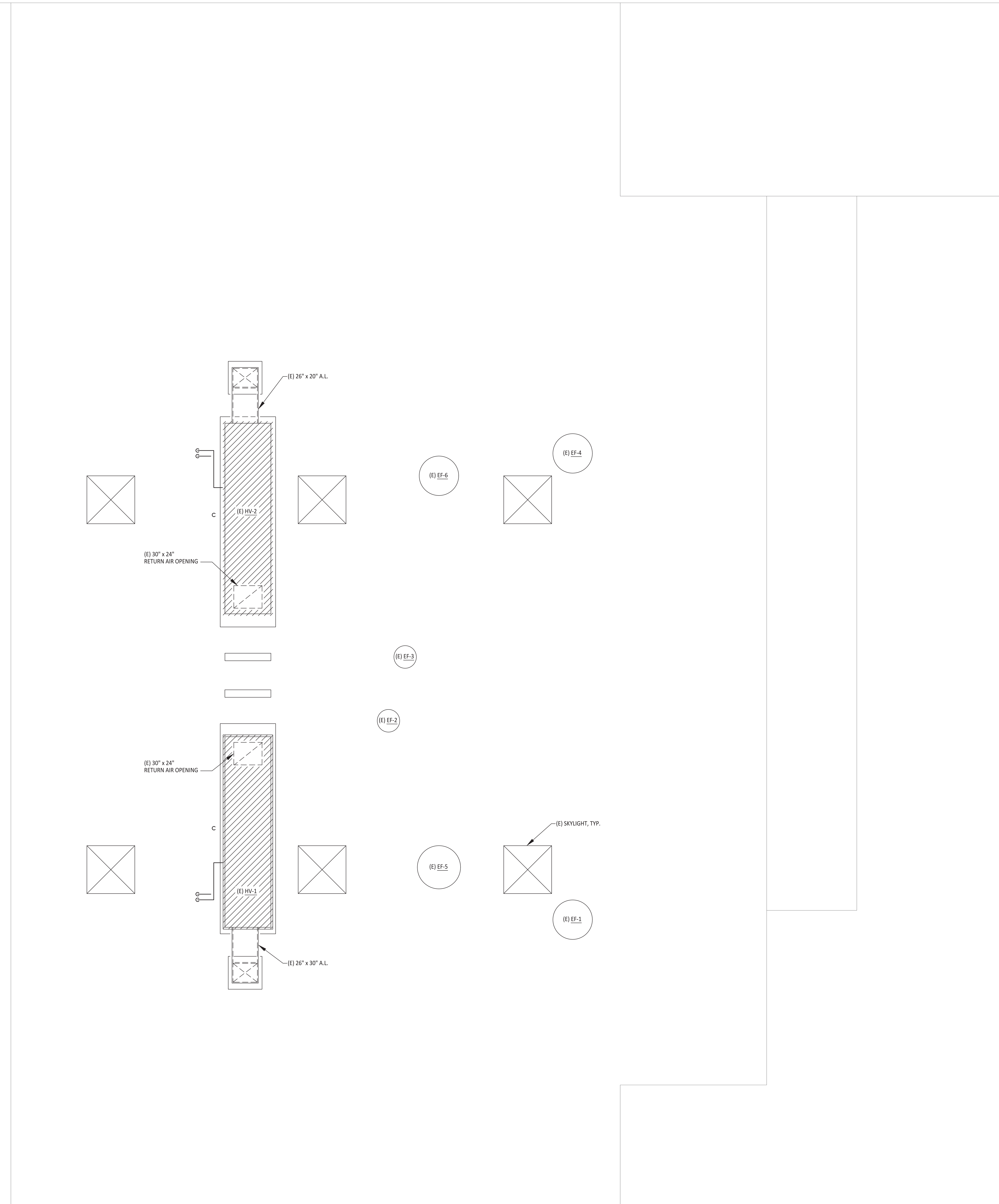
AE Project # : 20210099

ROUNDTREE FACILITY ROOFTOP UNIT REPLACEMENT

SANTA CRUZ COUNTY
90 ROUNDTREE LANE
WATSONVILLE, CA 95073

TITLE 24 - MECHANICAL

DATE	11/15/21
SCALE	NONE
DRAWN	CADD
JOB	20210099
SHEET	**M0.3**



GENERAL NOTES:

1. FIELD VERIFY ALL DUCT CONNECTION SIZES ON ROOF AND WITHIN CURB AND CEILING SPACE PRIOR TO BEGINNING ANY DEMOLITION WORK AND PRIOR TO ORDERING ANY CURB ADAPTORS.

AIR BALANCING NOTES:

1. PRE-BALANCE WORK: PRIOR TO PERFORMING ANY WORK, MEASURE EXISTING AIRFLOWS AT OUTSIDE AIR INTAKE, RETURN, AND SUPPLY AT EACH (E) RTU UNIT. MEASURE AIR FLOWS AT ALL OF THEIR ASSOCIATED SUPPLY DIFFUSERS AND RETURN GRILLES. PROVIDE WRITTEN REPORT TO ENGINEER.
2. FINAL BALANCING: ENGINEER SHALL REVIEW AND APPROVE PRE-BALANCE REPORT PRIOR TO PERFORMING ANY FINAL BALANCING WORK. FINAL BALANCING SHALL MEASURE AIRFLOWS AT OUTSIDE AIR INTAKE, RETURN AND SUPLY AT EACH RTU UNIT. MEASURE AIR FLOWS AT ALL OF THEIR ASSOCIATED SUPPLY AIR DIFFUSERS AND RETURN GRILLES. PROVIDE WRITTEN REPORT TO ENGINEER.

ROOF PLAN - MECHANICAL DEMOLITION

SCALE: 1/4" = 1'-0"

4' 0 4 8

NORTH

REVISIONS	DATE

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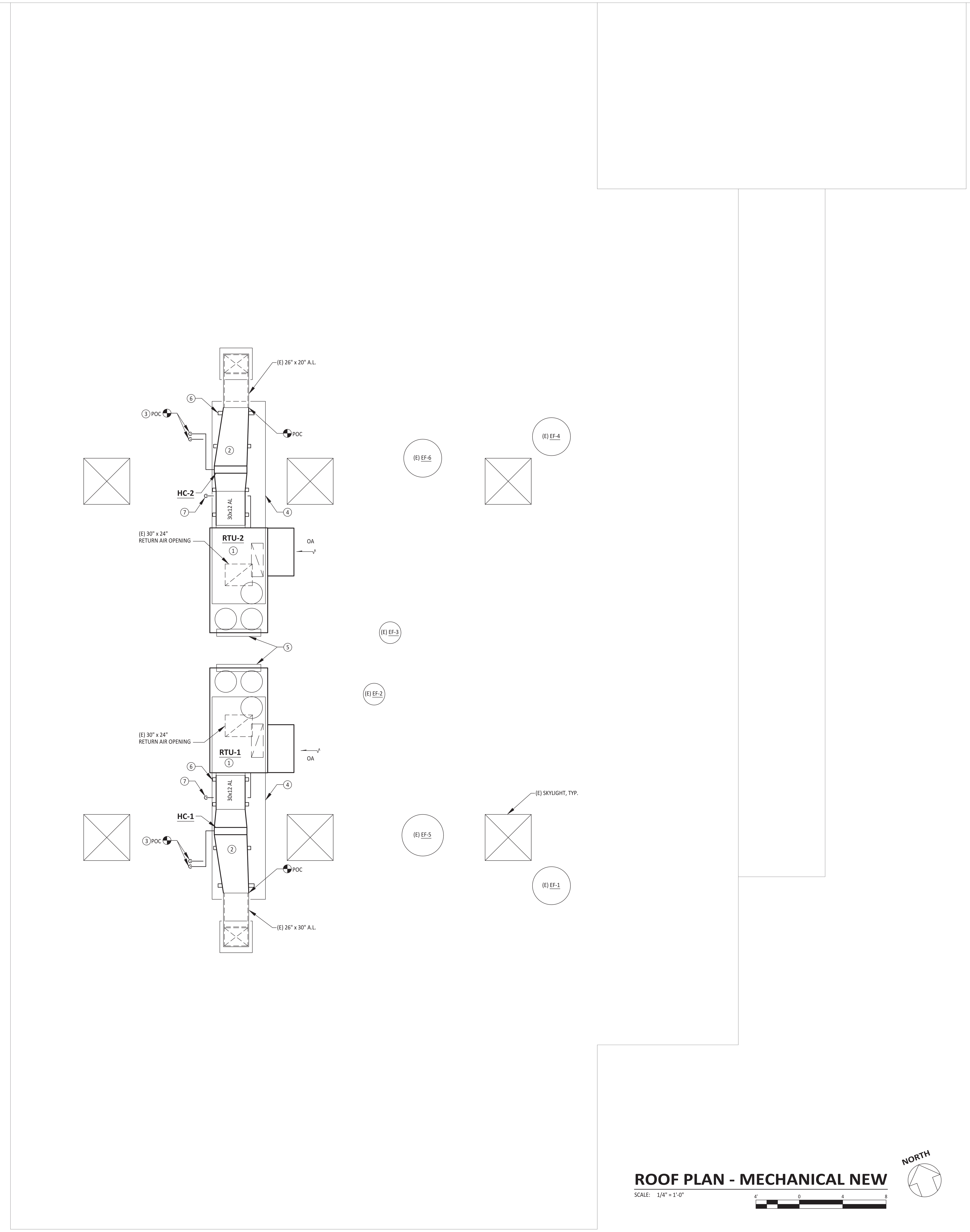
ROOF PLAN - MECHANICAL DEMOLITION

DATE	11/15/21
SCALE	1/4" = 1'-0"
DRAWN	CADD
JOB	20210099
SHEET	M1.0



ROOF PLAN - MECHANICAL NEW

SCALE: 1/4" = 1'-0"

NORTH

GENERAL NOTES:

1. FIELD VERIFY ALL DUCT CONNECTION SIZES ON ROOF AND WITHIN CURB AND CEILING SPACE PRIOR TO BEGINNING ANY DEMOLITION WORK AND PRIOR TO ORDERING ANY CURB ADAPTORS.

AIR BALANCING NOTES:

1. PRE-BALANCE WORK: PRIOR TO PERFORMING ANY WORK, MEASURE EXISTING AIRFLOWS AT OUTSIDE AIR INTAKE, RETURN, AND SUPPLY AT EACH (E) RTU UNIT. MEASURE AIR FLOWS AT ALL OF THEIR ASSOCIATED SUPPLY DIFFUSERS AND RETURN GRILLES. PROVIDE WRITTEN REPORT TO ENGINEER.

2. FINAL BALANCING: ENGINEER SHALL REVIEW AND APPROVE PRE-BALANCE REPORT PRIOR TO PERFORMING ANY FINAL BALANCING WORK. FINAL BALANCING SHALL MEASURE AIRFLOWS AT OUTSIDE AIR INTAKE, RETURN AND SUPPLY AT EACH NEW RTU UNIT. MEASURE AIR FLOWS AT ALL OF THEIR ASSOCIATED SUPPLY AIR DIFFUSERS AND RETURN GRILLES. PROVIDE WRITTEN REPORT TO ENGINEER.

SHEET NOTES:

(1) NEW AIR HANDLER WITH CURB ADAPTOR. SEE 1/M6.1. FIELD VERIFY CURB DIMENSIONS PRIOR TO ORDERING.

(2) SEAL NEW OUTDOOR DUCTWORK & TRANSITIONS WITH MATIC & PRIME & PAINT WITH 2 COATS OF RUSTOLEUM 9100 DTM.

(3) PROVIDE NEW 1-1/2" HEATING HOT WATER PIPING WITH 2" THICK INSULATION & METALLIC JACKETING RATED FOR OUTDOOR INSTALLATION. SEE 2/M6.1 FOR PIPING SUPPORTS. SEE 4/M6.1 FOR COIL CONNECTION REQUIREMENTS.

(4) CURB ADAPTOR SHALL EXTEND ENTIRE LENGTH OF EXISTING CURB RAIL WITH WEATHER TIGHT CURB CAP. CAP SHALL BE SUITABLE FOR ATTACHMENT OF DUCT SUPPORTS AS INDICATED.

(5) EXTEND EXISTING SUPPORT SLEEPER HEIGHT AS NEEDED TO ANCHOR CANTILEVERED END OF NEW ROOFTOP UNIT SIMILAR TO DUCT SUPPORT PER 3/M6.1. FASTEN HEAT PUMP FRAME TO STRUT SUPPORTS USING MIN. FOUR 1/2" MACHINE BOLTS, NUTS, & WASHERS.

(6) DUCT SUPPORT PER 3/M6.1.

(7) 3/4" CONDENSATE DRAIN STUBBED OUT PAST CURB OVER ROOF. PROVIDE PIPE SUPPORTS PER 2/M6.1. PROVIDE TRAP PER 5/M6.1.

REVISIONS	DATE

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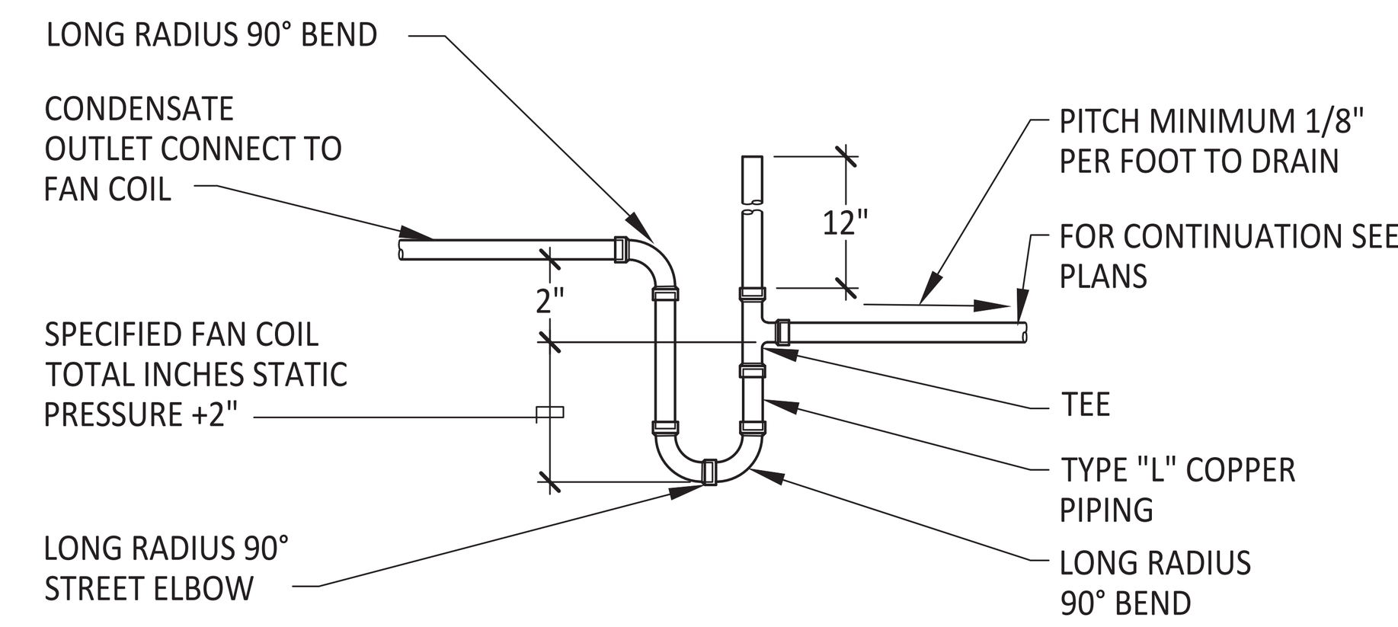
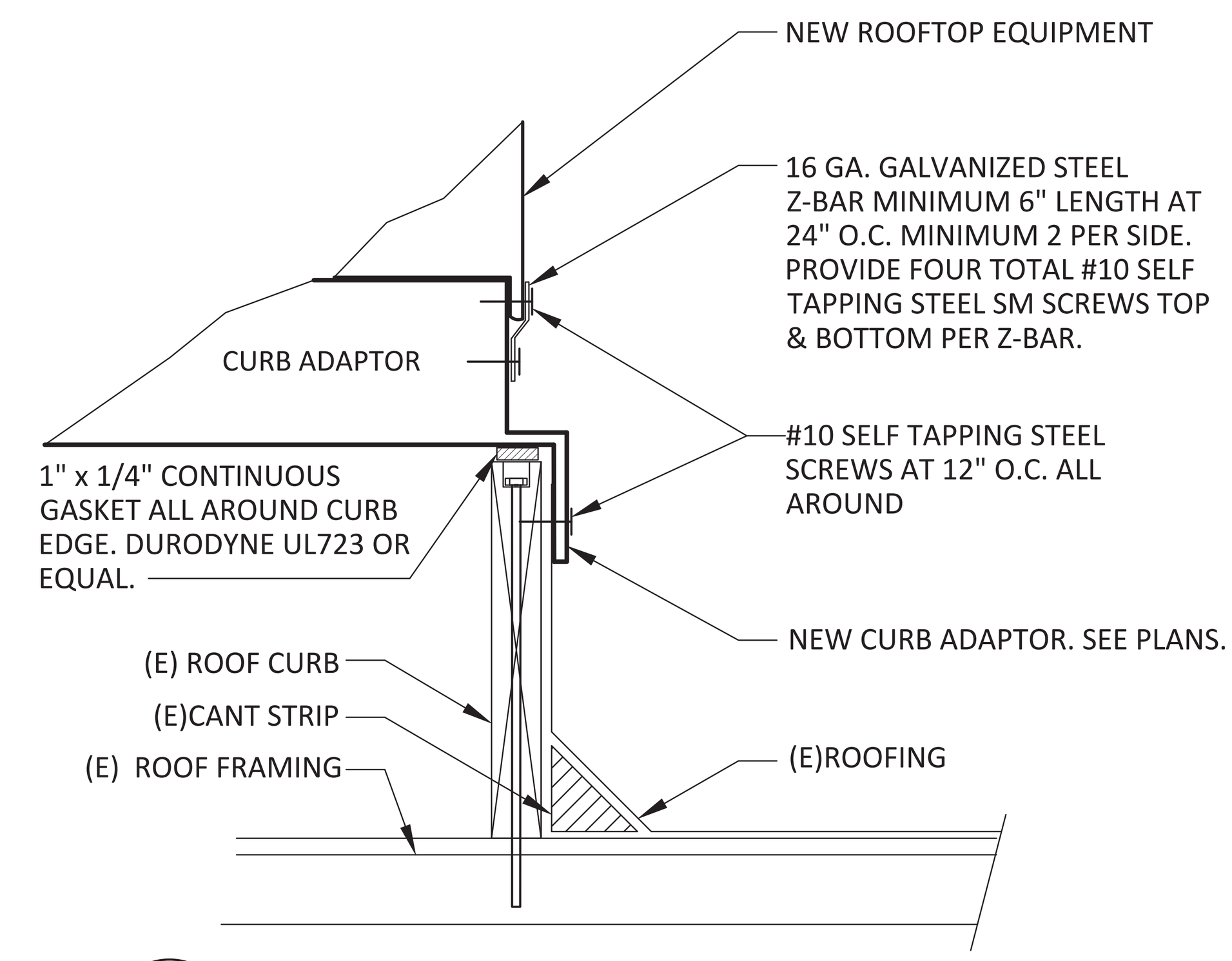
ROOF PLAN - MECHANICAL NEW

DATE	11/15/21
SCALE	1/4" = 1'-0"
DRAWN	CADD
JOB	20210099
SHEET	M1.1

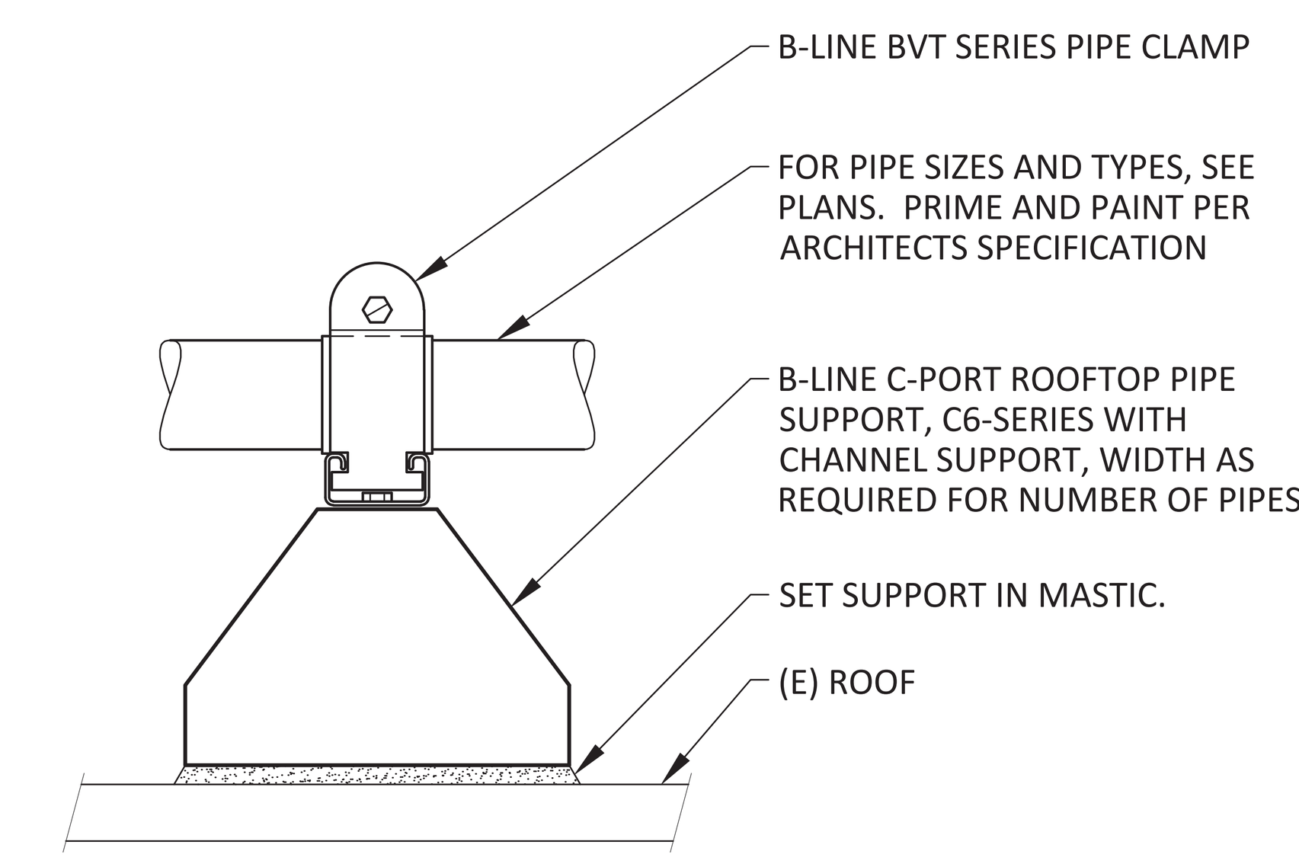


NOTE:
FOR CONDENSATE PIPE SIZES SEE PLANS

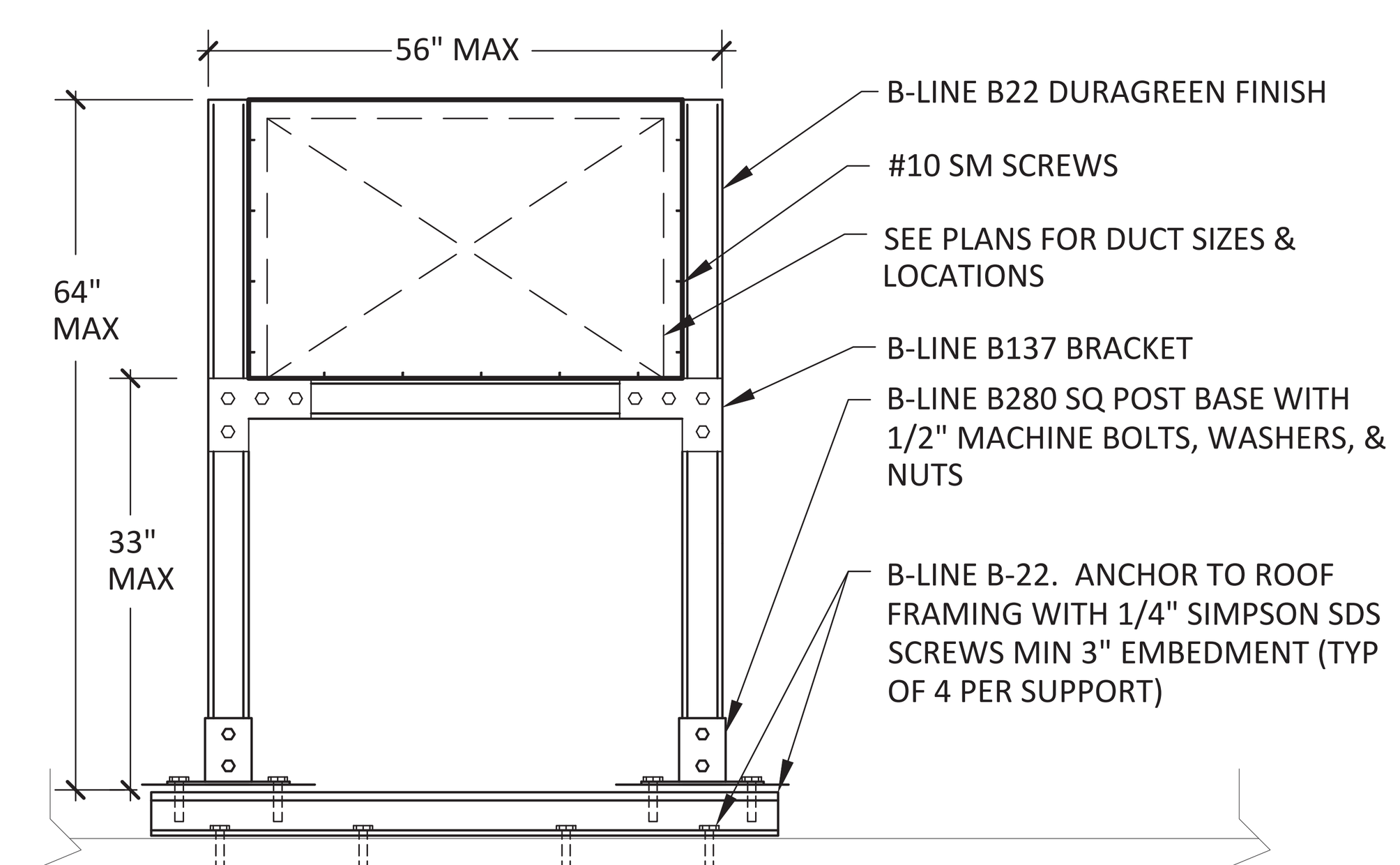
5 M6.1 CONDENSATE TRAP
NO SCALE



1 M6.1 ROOFTOP UNIT MOUNTING
NO SCALE

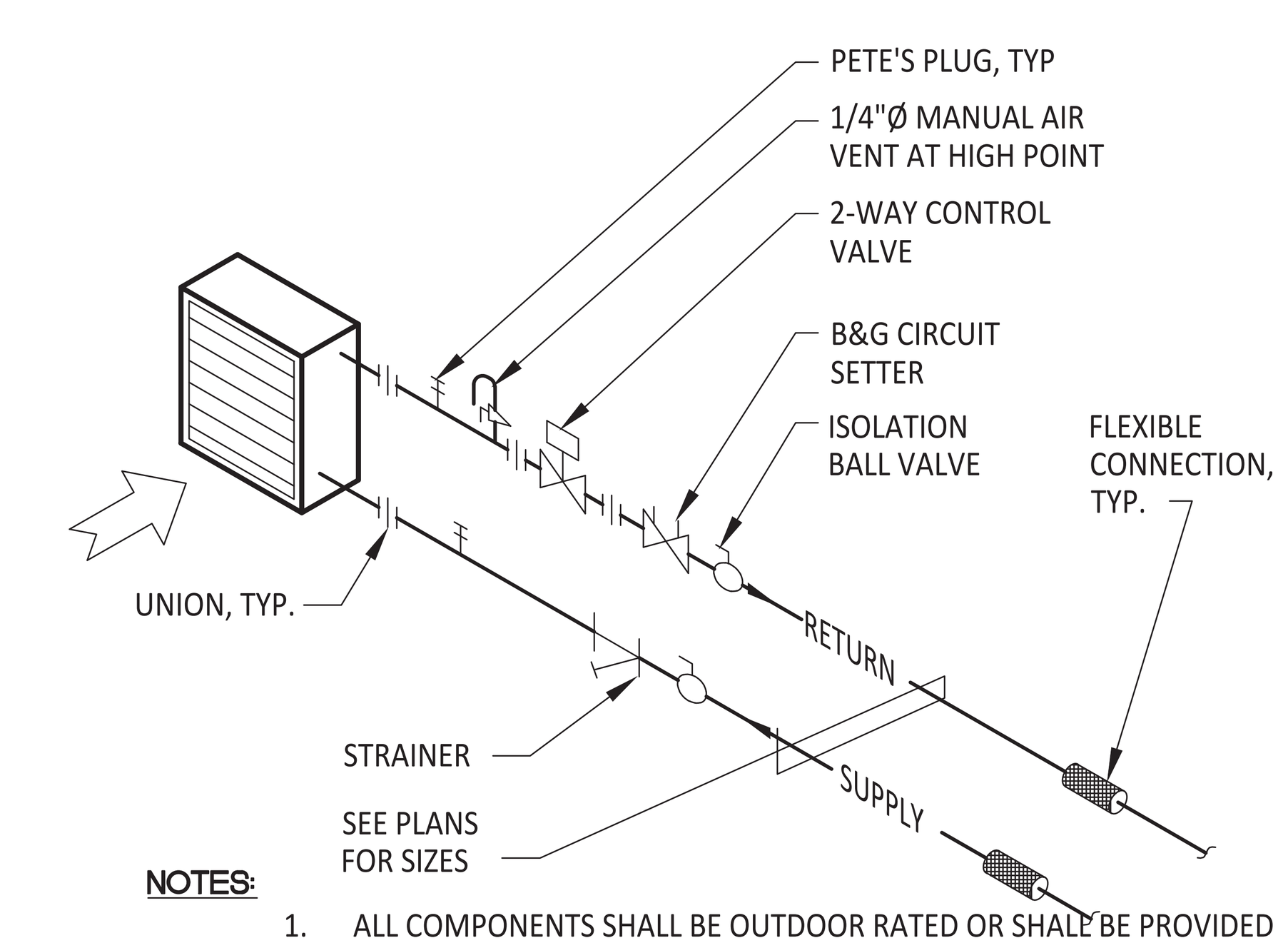


2 M6.1 PIPE SUPPORT ON ROOF
NO SCALE



NOTES:
1. B-LINE OR EQUAL STRUT & COMPONENTS SHALL HAVE FACTORY DURAGREEN FINISH.
2. DUCT SUPPORTS AHLL BE MAX 10' ON CENTER SPACING.

3 M6.1 ROOF DUCT SUPPORT
NO SCALE



NOTES:
1. ALL COMPONENTS SHALL BE OUTDOOR RATED OR SHALL BE PROVIDED WITH 316 STAINLESS STEEL PROTECTIVE HOUSING.
2. CONFIRM VALVE BODY SIZE AND CIRCUITS FOR SCHEDULED COIL FLOW RATES.

4 M6.1 HEATING HOT WATER COIL PIPING
NO SCALE
VAV TERMINAL UNIT COILS

REVISIONS	DATE

REGISTERED PROFESSIONAL ENGINEER SEAN L. RING No. M33543 EXP. SEPT. 30, 2022 MECHANICAL STATE OF CALIFORNIA

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90 ROUNDTREE LANE
WATSONVILLE, CA 95073

DETAILS - MECHANICAL

DATE	11/15/21
SCALE	AS NOTED
DRAWN	CADD
JOB	20210099
SHEET	M6.1

GENERAL CONSTRUCTION NOTES

1. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS. MATERIALS AND EQUIPMENT SHALL BE U.L. LISTED AND LABELED FOR THE APPLICATION.
2. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, LICENSES AND INSPECTION FEES REQUIRED BY THIS CONTRACT WORK.
3. CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO BIDDING AND ALLOW FOR ALL FIELD CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ELECTRICAL WORK NOTED AND CALLED OUT ON ALL CONTRACT DOCUMENTS. THE CONTRACTOR SHALL OBTAIN INFORMATION AND BE FAMILIAR WITH ALL OTHER TRADES WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION BETWEEN OTHER TRADES ON PROJECT.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF PERSONS AND PROPERTY AND SHALL PROVIDE INSURANCE COVERAGE AS NECESSARY FOR LIABILITY AND PERSONAL, PROPERTY DAMAGE, TO FULLY PROTECT THE OWNER, ARCHITECT AND ENGINEER FROM ANY AND ALL CLAIMS RESULTING FROM THIS WORK.
5. CONTRACTOR SHALL MAINTAIN RECORD DRAWINGS AT THE PROJECT SITE INDICATING ALL MODIFICATIONS TO ELECTRICAL SYSTEMS. THE CONTRACTOR SHALL AT THE CONCLUSION OF THE PROJECT PROVIDE ACCURATE "AS-BUILT" DRAWINGS ACCEPTABLE TO THE ARCHITECT.
6. ALL MATERIALS PROVIDED TO THE PROJECT SHALL BE NEW. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE AND INSTALL ALL INCIDENTAL MATERIALS REQUIRED FOR A COMPLETE INSTALLATION.
7. CONTRACTOR SHALL PROVIDE TO THE ARCHITECT A CONSTRUCTION SCHEDULE OF ELECTRICAL WORK. THE CONSTRUCTION SCHEDULE SHALL IDENTIFY ALL SIGNIFICANT MILESTONES WITH COMPLETION DATES.
8. CONTRACTOR SHALL PROVIDE ALL REQUIRED "CUTTING, PATCHING, EXCAVATION, BACKFILL AND REPAIRS" NECESSARY TO RESTORE DAMAGED SURFACES TO EQUAL OR BETTER THAN ORIGINAL CONDITIONS EXISTING AT START OF WORK.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR PAINTING ALL EXPOSED CONDUITS AND ELECTRICAL EQUIPMENT. REFER TO ARCHITECTS PAINTING SECTION FOR REQUIREMENTS.
10. ALL ELECTRICAL EQUIPMENT INSTALLED OUTDOORS SHALL BE WEATHERPROOF. EXTERIOR CONDUITS RUN INTO BUILDINGS SHALL BE INSTALLED WITH FLASHING, CAULKED AND SEALED. CONDUITS FOR EXTERIOR ELECTRICAL DEVICES SHALL BE RUN INSIDE BUILDING UNLESS OTHERWISE NOTED ON DRAWINGS.
11. ALL CONDUITS UNLESS OTHERWISE NOTED ON DRAWINGS SHALL HAVE AS A MINIMUM: TWO (2) #12s WITH ONE (1) #12 GROUND. "TICK" MARKS SHOWN ON CIRCUITRY ARE FOR ROUGH ESTIMATING ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WIRES AND WIRE SIZES REQUIRED BY LATEST CODE.
12. ALL BRANCH CIRCUITS SHALL HAVE INDIVIDUAL NEUTRALS. SHARED NEUTRALS ON MULTIWIRE CIRCUITS IS NOT ALLOWED.
13. ALL 120/277V LIGHT SWITCHES AND WALL OCCUPANT SENSORS SHALL HAVE A NEUTRAL INSTALLED TO THE DEVICE BOX EXCEPT WHERE A CONDUIT OR SURFACE RACEWAY SYSTEM IS INSTALLED.
14. COORDINATE ALL CONDUIT RUNS, ELECTRICAL EQUIPMENT AND PANELS WITH ALL OTHER WORK TO AVOID CONFLICTS.
15. SEE ARCHITECTURAL DOCUMENTS FOR EXACT PLACEMENT OF LIGHTING FIXTURES AND DEVICES. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF CEILING TYPES FROM ARCHITECTURAL DOCUMENTS AND PROVIDE AND INSTALL ALL REQUIRED FIXTURE MOUNTING HARDWARE. PROVIDE AND INSTALL U.L. LISTED FIRE STOP ENCLOSURES FOR ALL RECESSED FIXTURES IN FIRE RATED CEILINGS..
16. CONTRACTOR SHALL PROVIDE IN EVERY NEW EMPTY CONDUIT A DRAW STRING FOR USE IN FUTURE CONSTRUCTION.
17. ALL CONDUIT SHALL BE CONCEALED WHERE POSSIBLE. CUT AND PATCH EXISTING WALLS WHERE NECESSARY. WHERE IT IS NECESSARY TO CUT OR BORE EXISTING STRUCTURAL WALLS FOR NEW ELECTRICAL WORK OBTAIN PERMISSION FROM THE ARCHITECT PRIOR TO STARTING WORK. REUSE EXISTING CONDUIT WHERE POSSIBLE.
18. WHERE IT IS NOT POSSIBLE TO REUSE EXISTING CONDUIT OR RUN NEW CONCEALED CONDUIT USE NON-METALLIC SURFACE RACEWAY AND BOXES. ROUTING OF ALL NON-METALLIC RACEWAYS SHALL BE APPROVED BY THE ARCHITECT OR OWNER'S REPRESENTATIVE PRIOR TO ROUGH-IN.
19. EXISTING WIRING SHOWN HAS BEEN TAKEN FROM OLD PLANS AND IS ASSUMED TO BE CORRECT. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY ACTUAL CONDITIONS AND MAKE ADJUSTMENTS TO SUIT ACTUAL CONDITIONS AND TO MEET THE INTENT OF THE CONTRACT DOCUMENTS.

ELECTRICAL SYMBOLS & ABBREVIATIONS

SYMBOLS & ABBREVIATIONS SHOWN ARE FOR GENERAL USE. DISREGARD THOSE WHICH DO NOT APPEAR ON THE PLANS.

- FLUORESCENT OR LED LUMINAIRE - SEE SCHEDULE
- EMERGENCY OR NIGHT LIGHT
- STRIP FLUORESCENT OR LED LUMINAIRE - SEE SCHEDULE
- LUMINAIRE - RECESSED - SEE SCHEDULE
- RECESSED WALL WASHER
- LUMINAIRE - SURFACE MOUNTED - SEE SCHEDULE
- LUMINAIRE - POLE OR POST MOUNTED - SEE SCHEDULE
- LUMINAIRE - WALL MOUNTED SEE SCHEDULE
- BOLLARD OR PATH LIGHT - SEE SCHEDULE
- EXIT LIGHT - DIRECTIONAL ARROWS AS INDICATED - SEE SCHEDULE
- TRACK LIGHTING - SEE SCHEDULE
- EMERGENCY LIGHT
- DIGITAL DUAL TECHNOLOGY OCC. SENSOR
- LIGHTING CONTROL OCCUPANCY SENSOR CORNER MOUNTED
- DRC — DIMMER ROOM CONTROLLER
- PC — PLUG LOAD CONTROLLER
- RC — ROOM LIGHTING CONTROLLER
- LCP — LIGHTING CONTROL PANEL
- DL — DIGITAL DAYLIGHT SENSOR
- $ — SINGLE POLE SWITCH **
- $a — SINGLE POLE SWITCH, ** a = CIRCUIT CONTROLLED
- $3 — THREE WAY SWITCH**
- $4 — FOUR WAY SWITCH**
- $M — MANUAL MOTOR STARTER
- $K — KEY OPERATED SWITCH**
- LIGHTING DIMMER**
- DIGITAL ON/OFF SWITCH **
- $D — DIGITAL DIMMER SWITCH **
- $M# — DIGITAL MULTI SCENE LIGHTING SWITCH **
- $S — DIGITAL DUAL TECHNOLOGY WALL OCC. SENSOR **
- WALL OCCUPANCY SENSOR **
- DOUBLE SWITCHED WALL OCCUPANCY SENSOR **
- DIMMING DUAL TECHNOLOGY WALL SWITCH OCCUPANCY SENSOR **
- 2-BUTTON DIMMING DUAL TECHNOLOGY WALL SWITCH OCCUPANCY SENSOR **

- SECURITY DOOR CONTACTS
- MD — SECURITY MOTION DETECTOR
- SC — CCTV CAMERA
- KP — SECURITY SYSTEM KEYPAD
- DOOR BELL PUSHBUTTON
- CH — DOOR CHIME WITH LED
- RECEPTACLE - DUPLEX *
- DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
- GFCI CONVENIENCE RECEPTACLE - DUPLEX*
- GFCI CONVENIENCE DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
- RECEPTACLE DOUBLE DUPLEX*
- HALF SWITCHED DUPLEX RECEPTACLE *
- SINGLE RECEPTACLE*
- DUPLEX RECEPTACLE - CEILING MOUNTED
- HC — LETTER INDICATES DUPLEX HALF CONTROLLED RECEPTACLE *
- C — LETTER INDICATES DUPLEX FULLY CONTROLLED RECEPTACLE *
- FLOOR MOUNTED DUPLEX RECEPTACLE
- FLOOR MOUNTED BOX
- POWER OUTLET - SEE PLANS FOR NEMA TYPE*
- POWER POLE
- WALL TELEPHONE OUTLET **
- [#] VOICE/DATA WALL OUTLET *
- [#] VOICE/DATA OUTLET MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
- [#] SURFACE MOUNTED VOICE/DATA WALL OUTLET *
- [#] SURFACE MOUNTED VOICE/DATA OUTLET MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
- WIRELESS ACCESS POINT (WAP) - CEILING MOUNTED
- WIRELESS ACCESS POINT (WAP) - WALL MOUNTED - FIELD VERIFY HEIGHT
- [#] VOICE/DATA OUTLET - FLOOR MOUNTED
- TV OUTLET *
- [#] VOICE/DATA OUTLET - CEILING MOUNTED
- S — INTERIOR SPEAKERS CEILING MOUNTED
- S — INTERIOR SPEAKERS WALL MOUNTED
- C — CLOCK +8'-0" AFF U.O.N. VERIFY BEFORE INSTALLATION

- PANELBOARD - FLUSH MOUNTED
- EQUIPMENT PANEL - FLUSH MOUNTED
- PANELBOARD - SURFACE MOUNTED
- EQUIPMENT PANEL - SURFACE MOUNTED
- M — METER W/ CURRENT TRANSFORMER
- J — JUNCTION BOX - CEILING OR WALL MOUNTED, SIZE PER CODE, TAPE AND TAG WIRES
- MOTOR CONNECTION
- NON-FUSED DISCONNECT SWITCH
- FUSED DISCONNECT SWITCH; FUSED WITH DUAL-ELEMENT FUSES SIZED PER EQUIPMENT MFGR'S NAMEPLATE DATA
- COMBINATION STARTER/FUSED DISCONNECT SWITCH; FUSED DISCONNECT SWITCH ELEMENT FUSES SIZED PER EQUIPMENT MFGRS NAMEPLATE DATA
- MAGNETIC STARTER - NEMA SIZE INDICATED NEMA 3R ENCLOSURE UNLESS OTHERWISE SPECIFIED
- CIRCUIT BREAKER
- GROUND ROD WITH GROUNDWELL BOX
- GROUND ELECTRODE
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- TRANSFORMER - SEE SINGLE LINE FOR SIZE
- PULLBOX
- FLEX CONDUIT WITH CONNECTION
- CONDUIT - UP
- CONDUIT - DOWN
- E — CONDUIT EMERGENCY SYSTEM
- LV — LOW VOLTAGE WIRING
- SURFACE METAL OR NON-METALLIC RACEWAY
- CONDUIT - CONCEALED IN WALLS OR CEILING
- CONDUIT - EXISTING
- CONDUIT - BELOW SLAB OR UNDERGROUND: 3/4"MIN.
- CAPPED OR STUB-OUT CONDUIT
- CONDUIT CONTINUATION
- #10 — CONDUIT - HOME RUN TO PANEL, TERMINAL CABINET, ETC. RUNS MARKED WITH CROSSHATCHES INDICATE NUMBER OF #12 AWG WIRES WHEN MORE THAN TWO. SIZE CONDUIT ACCORDING TO SPECIFICATIONS AND APPLICABLE CODE. CROSS HATCHES WITH NUMBER ADJACENT INDICATES WIRE SIZE OTHER THAN #12 AWG.
- 2 — SHEET NOTE REFERENCE SYMBOL; SEE ASSOCIATED NOTE ON SAME SHEET
- 3 — SCHEDULE SYMBOL; SEE ASSOCIATED NOTE ON SAME SHEET

- 2 — DETAIL NOTE REFERENCE SYMBOL SEE ASSOCIATED NOTE ON SAME DETAIL
- F301 — FEEDER DESIGNATION; SEE ASSOCIATED NOTE ON SAME DETAIL
- 1 / E3.0 — DETAIL NUMBER; DETAIL OR SECTION REFERENCE; SHEET NUMBER
- 1 — INDICATES QUANTITY OF TELEPHONE OUTLETS
- 2 — INDICATES QUANTITY OF DATA OUTLETS

ABBREVIATIONS

A	AMPERE	GFCI	GROUND FAULT	NTS	NOT TO SCALE
AFF	ABOVE FINISHED FLOOR	GFI	INTERRUPTING	OAH	OVERALL HEIGHT
ALUM/AL	ALUMINUM	GND, G	GROUND	OC	ON CENTER
ARCH	ARCHITECT	GRS	GALVANIZED RIGID STEEL	OH	OVERHEAD
AWG	AMERICAN WIRE GAUGE	HT	HEIGHT	PA	PUBLIC ADDRESS
BKR	BREAKER	IC	INTERCOM	PB	PULL BOX
C	CONDUIT	IDF	INTERMEDIATE DISTRIBUTION FRAME	PF	POWER FACTOR
CATV	CABLE TV	INCAND	INCANDESCENT	PH	PHASE
CB	CIRCUIT BREAKER	JB	JUNCTION BOX	PIR	PASSIVE INFRARED
CCTV	CLOSED CIRCUIT TV	KV	KILOVOLT	PNL	PANEL
CKT	CIRCUIT	KVA	KILOVOLT AMPERES	PV	PHOTOVOLTAIC
CL	CENTER LINE	KW	KILOWATT	PVC	POLYVINYL CHLORIDE
CLG	CEILING	LCP	LIGHTING CONTROL PANEL	PWR	POWER
C.O.	CONDUIT ONLY	LTG	LIGHTING	(R)	EXISTING TO BE REMOVED
CTR	CENTER	LV	LOW VOLTAGE	(RP)	REMOVABLE POLE
D	DIMMER	KCM	THOUSAND CIRCULAR MILS	RECPT'S	RECEPTACLES
DIM	DIMENSION	M.B.	MAIN CIRCUIT BREAKER	REQD	REQUIRED
DIST	DISTRIBUTION	MCA	MINIMUM CIRCUIT AMPS	REQMT'S	REQUIREMENT(S)
(E)	EXISTING	MDF	MAIN DISTRIBUTION FRAME	SHT	SHEET
EC	ELECTRICAL CONTRACTOR	MECH	MECHANICAL	SLD	SINGLE LINE DIAGRAM
(EL)	EVENING LIGHT	MH	METAL HALIDE	STC	SYSTEMS TERMINATION CABINET
EM	EMERGENCY	MLO	MAIN LUGS ONLY	SW	SWITCH
EMT	ELECTRICAL METALLIC TUBING	MPOE	MAIN POINT OF ENTRANCE	SWBD	SWITCHBOARD
EQUIP	EQUIPMENT	MTD	MOUNTED	TTB	TELEPHONE TERMINAL BACKBOARD
EV	ELECTRICAL VEHICLE	MTG	MOUNTING	TYP	TYPICAL
FA	FIRE ALARM	MOCP	MAXIMUM OVER CURRENT PROTECTION	UON	UNLESS OTHERWISE NOTED
FACP	FIRE ALARM CONTROL PANEL	(N)	NEW	UG	UNDERGROUND
FC	FOOT CANDLE	NIC	NOT IN CONTRACT	V	VOLT
FIN	FINISH	NIEC	NOT IN ELECTRICAL CONTRACT	VD	VOLTAGE DROP
FL	FLOOR	(NL)	NIGHT LIGHT	W	WATT
FLA	FULL LOAD AMPS	NO.	NUMBER	W/	WITH
FLUOR	FLUORESCENT	NOM	NOMINAL	WP	WEATHERPROOF
(F)	FUTURE			XFMR	TRANSFORMER
GC	GENERAL CONTRACTOR				

FIRE ALARM

NOTE: SEE FIRE ALARM DRAWINGS FOR QUANTITIES AND MOUNTING HEIGHTS.

- P — MANUAL PULL STATION
- STROBE ONLY
- HORN ONLY
- M — MINI HORN
- HORN/STROBE
- CHIME/STROBE
- HEAT DETECTOR
- SMOKE DETECTOR
- CO — CARBON MONOXIDE ALARM
- DUCT SMOKE DETECTOR
- TAMPER SWITCH
- FLOW SWITCH
- POST INDICATING VALVE
- FIRE SMOKE DAMPER
- BELL (GONG)
- FCP — FIRE ALARM CONTROL PANEL
- APS — AUXILIARY POWER SUPPLY
- FSA — FIRE SYSTEM ANNUNCIATOR
- FTR — FIRE ALARM TRANSPONDER OR TRANSMITTER
- ESR — ELEVATOR STATUS/RECALL
- FAC — FIRE ALARM COMMUNICATOR
- ANN — REMOTE ANNUNCIATORS
- EOL — END OF LINE

* +15" A.F.F. TO BOTTOM OF BOX, U.O.N.
** +48" A.F.F. TO TOP OF BOX, U.O.N.
[#] NUMBER IN BRACKETS DENOTES NUMBER OF CABLE DROPS WHEN MORE THAN (2).

GENERAL DEMOLITION NOTES

A. CONTRACTOR SHALL FIELD VERIFY EXTENT OF ELECTRICAL DEMOLITION AND QUANTITIES OF ELECTRICAL TO BE REMOVED AS DICTATED BY THE REQUIREMENTS OF THE PROJECT.

B. REMOVAL SHALL INCLUDE WIRING, RACEWAY, BOXES, SWITCHES, LIGHT FIXTURES, ETC. AS INDICATED ON THE PLANS AND AS REQUIRED BY THESE DEMOLITION NOTES.

C. RACEWAYS ASSOCIATED WITH ELECTRICAL BEING DEMOLISHED WHICH ARE CONCEALED IN EXISTING REMAINING WALLS MAY BE ABANDONED IN PLACE. REMOVE WIRING FROM CONDUIT.

D. RACEWAYS ASSOCIATED WITH ELECTRICAL BEING DEMOLISHED WHICH ARE EXPOSED SHALL BE REMOVED.

E. WHERE REMOVAL OF EQUIPMENT OR WIRING IS INDICATED, IT SHALL INCLUDE ALL ASSOCIATED WIRING BACK TO LAST ACTIVE REMAINING OUTLET, DEVICE, FIXTURE OR PANEL.

F. ELECTRICAL CONTRACTOR SHALL INSURE THAT ALL REMAINING ACTIVE CIRCUITS, DEVICES, OUTLETS, LIGHT FIXTURES, ETC. HAVE NOT BEEN DISCONNECTED OR MADE INOPERATIVE DURING DEMOLITION. ELECTRICAL CONTRACTOR SHALL RESTORE ALL INTERRUPTED OR DISCONNECTED CIRCUITS TO OPERATION.

G. ELECTRICAL CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL REMOVED ELECTRICAL EQUIPMENT AND MATERIAL.

H. NO REMOVED EQUIPMENT OR MATERIAL SHALL BE REUSED AS PART OF NEW WORK, U.O.N.

I. EXISTING REMAINING CONCEALED RACEWAYS MAY BE REUSED FOR NEW WORK PROVIDED THEY MEET ALL REQUIREMENTS OF THE SPECIFICATION FOR NEW WORK.

J. EXISTING FLUSH OUTLETS MAY BE REUSED FOR NEW WORK PROVIDED THEY MEET ALL REQUIREMENTS OF THE SPECIFICATION FOR NEW WORK, MEET THE REQUIREMENTS OF THE CURRENT C.E.C. FOR VOLUME AND COINCIDE WITH LOCATION SHOWN FOR THE NEW WORK.

K. FLUSH OUTLET BOXES IN EXISTING WALLS TO REMAIN MAY BE ABANDONED IN PLACE. REMOVE DEVICES AND WIRING, PLUG OPENING AND PROVIDE AND INSTALL A BLANK DEVICE PLATE.

L. EXISTING WIRING SHOWN HAS BEEN TAKEN FROM OLD PLANS AND IS ASSUMED TO BE CORRECT. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY ACTUAL CONDITIONS AND MAKE ADJUSTMENTS TO SUIT ACTUAL CONDITIONS AND TO MEET THE INTENT OF THE CONTRACT DOCUMENTS.

M. WHERE TELEPHONE, COMPUTER DATA, FIBER OPTICS, FIRE ALARM OR OTHER COMMUNICATIONS OUTLETS OR WIRING IS TO BE DEMOLISHED IT SHALL BE REMOVED BACK TO THE NEXT TERMINAL POINT. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OWNER OR HIS REPRESENTATIVE TO HAVE EQUIPMENT AND WIRING DESIGNATED FOR REMOVAL OR PRESERVATION PRIOR TO REMOVAL OF OUTLET BOXES, CONDUIT OR WIRING BY ELECTRICAL CONTRACTOR.

N. COORDINATE WITH OWNER PRIOR TO START OF DEMOLITION TO MINIMIZE POWER INTERRUPTIONS, WORK MAY HAVE TO OCCUR DURING NON-REGULAR BUSINESS HOURS. COORDINATE IN WRITING WITH OWNER ONE WEEK PRIOR TO PLANNED POWER INTERRUPTIONS.

APPLICABLE CODES & STANDARDS

CODES:

1. 2019 CALIFORNIA ADMINISTRATIVE CODE C.C.R., TITLE 24, PART 1.
2. 2019 CALIFORNIA BUILDING CODE (CBC) C.C.R., TITLE 24, VOL. 1 & 2 BASED ON THE 2018 INTERNATIONAL BUILDING CODE (IBC) WITH CALIFORNIA AMENDMENTS.
3. 2019 CALIFORNIA ELECTRICAL CODE (CEC) C.C.R., TITLE 24, PART 3 BASED ON THE 2017 NATIONAL ELECTRICAL CODE (NEC) WITH CALIFORNIA AMENDMENTS.
4. 2019 CALIFORNIA MECHANICAL CODE (CMC) C.C.R., TITLE 24, PART 4 BASED ON THE 2018 UNIFORM MECHANICAL CODE (UMC) WITH CALIFORNIA AMENDMENTS.
5. 2019 CALIFORNIA PLUMBING CODE (CPC) C.C.R., TITLE 24, PART 5 BASED ON THE 2018 UNIFORM PLUMBING CODE (UPC) WITH CALIFORNIA AMENDMENTS.
6. 2019 CALIFORNIA ENERGY CODE C.C.R., TITLE 24, PART 6.
7. 2019 CALIFORNIA FIRE CODE (CFC) C.C.R., TITLE 24, PART 9 BASED ON THE 2018 INTERNATIONAL FIRE CODE (IFC) WITH CALIFORNIA AMENDMENTS.
8. 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE C.C.R., TITLE 24, PART 11.
9. 2019 CALIFORNIA REFERENCED STANDARDS CODE C.C.R., TITLE 24, PART 12.
10. TITLE 19 C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.
11. NATIONAL FIRE ALARM CODE (NFPA 72) 2016.
12. COUNTY OF SANTA CRUZ ORDINANCES, CODES, AND REGULATIONS.

STANDARDS:

1. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
2. ELECTRONICS INDUSTRIES ASSOCIATION (EIA)
3. INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)
4. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
5. NATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)
6. UNDERWRITER LABORATORIES (UL)
7. CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH ACT STANDARDS (CAL/OSHA)

SHEET INDEX

REGISTERED PROFESSIONAL ENGINEER CURTIS J. TAYLOR No. E23019 EXP. 12/31/21 ELECTRICAL STATE OF CALIFORNIA

FOR PLAN CHECK ONLY

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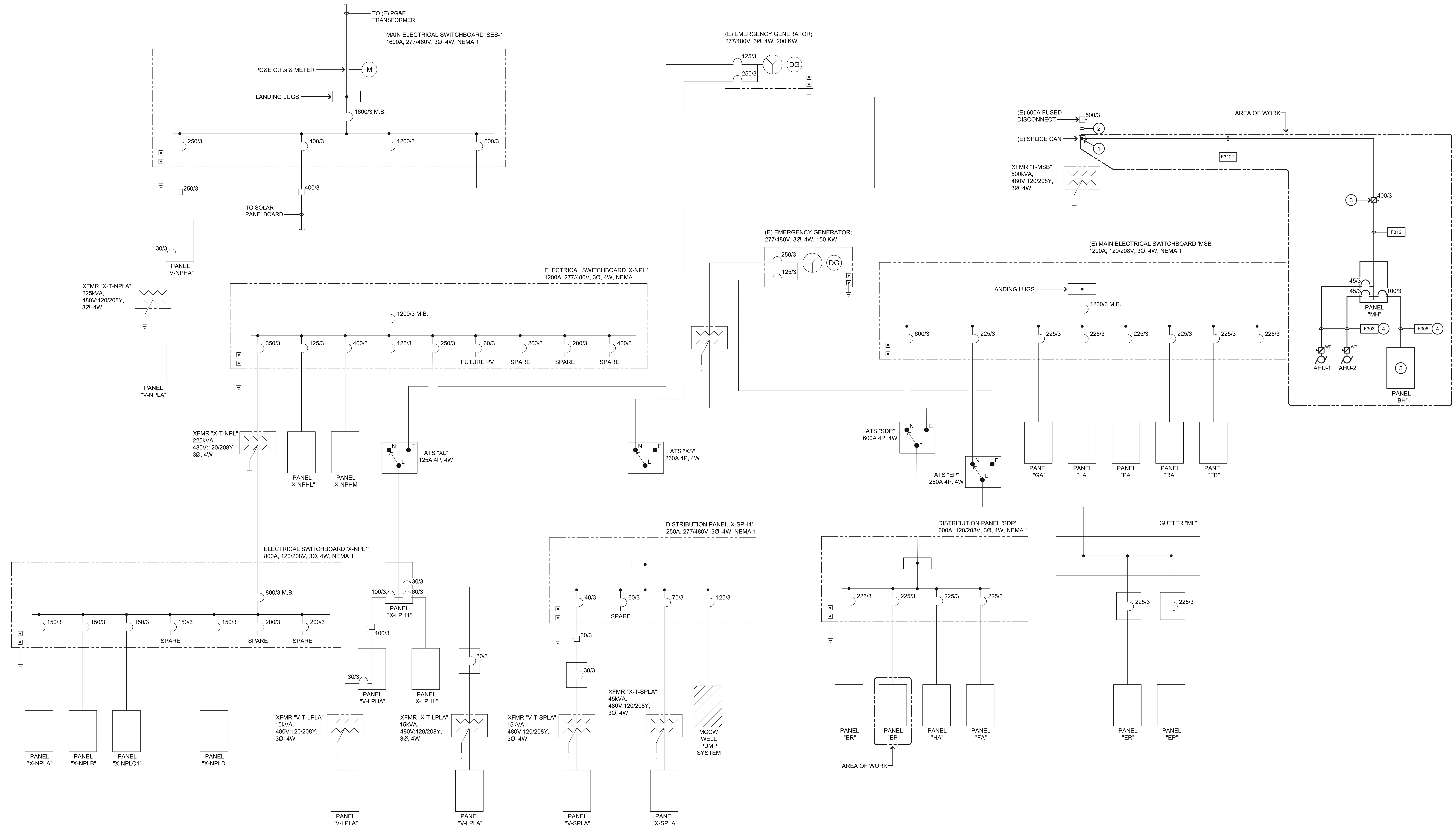
AE Project #: 20210099

ROUNDTREE FACILITY
ROOFTOP UNIT REPLACEMENT

SANTA CRUZ COUNTY
90 ROUNDTREE LANE
WATSONVILLE, CA 95073

SYMBOLS, ABBREVIATIONS, DEMOLITION NOTES, CODES, STANDARDS & SHEET INDEX

DATE 11/19/21
SCALE
DRAWN CADD
JOB 20210099
SHEET E0.1



1 SINGLE LINE DIAGRAM

NO SCALE

DETAIL NOTES:

1. SPLICE NEW PARALLEL 400A FEEDER ONTO (E) PARALLEL 600A USING NSI LUG-SPLICING KIT RATED FOR COPPER CONDUCTORS.
2. (E) 600A FEEDER: (2) SETS OF 4 #350kcm & (E) 1 #1/0 GND (PARALLEL).
3. HEAVY-DUTY FUSED DISCONNECT SWITCH: 400A, 600V, NEMA 3R, 3Ø, 3W, UNSWITCHED GROUND, NO NUETRAL, DOUBLE LUGS FOR INCOMMING CONNECTION.
4. FEEDERS OVERSIZED FOR ROOF MOUNTED TEMPERATURE DERATING.
5. COORDINATE PANEL BREAKER REQUIREMENTS WITH COUNTY BOILER EQUIPMENT PROJECT.

SINGLE LINE DIAGRAM LEGEND

(hatched line)	(DEMOLISH)
(thin line)	(EXISTING)
(bold line)	(NEW)
(thin dashed line)	(E) FLOOR/PAD MOUNTED EQUIPMENT
(bold dashed line)	(N) FLOOR/PAD MOUNTED EQUIPMENT

FEEDER SCHEDULE

DESIGNATION	AMPACITY	CONDUIT & CONDUCTORS SIZES
F303	70	1 1/4" C., 3 #4 & 1 #8 GND.
F306	150	1 1/2" C., 3 #1/0 & 1 #6 GND.
F312	400	3 1/2" C., 3 #500kcm & 1 #2 GND.
F312P	400	(2) SETS OF 2" C., EACH W/3 #3/0 & 1 #2 GND (PARALLEL).
F313C	600	(E) (2) 3 1/2" C., EACH W/ NEW 3 #350kcm & 1 #1/0 GND (PARALLEL).

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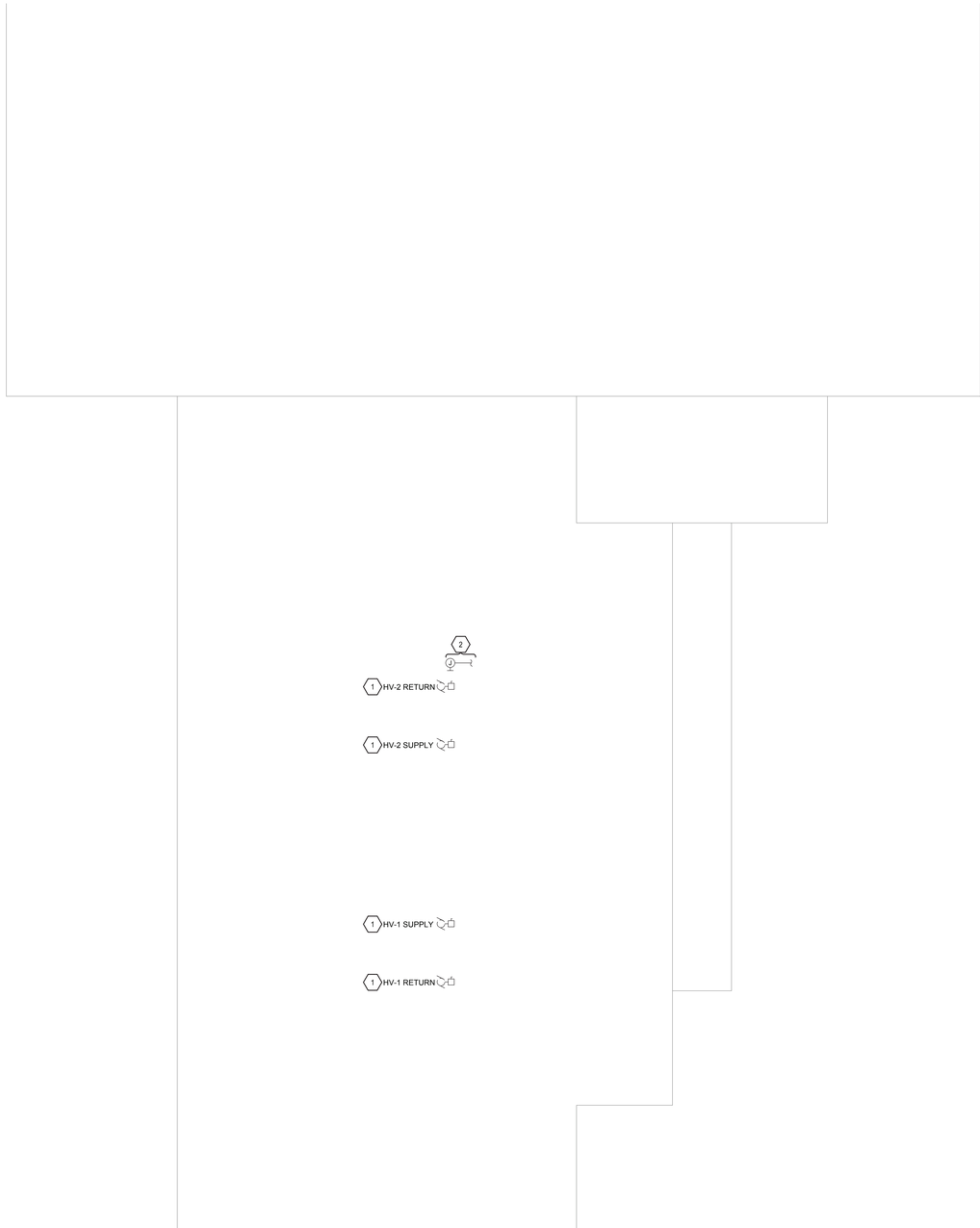
WATSONVILLE, CA 95073

ELECTRICAL SINGLE LINE DIAGRAM

DATE	11/19/21
SCALE	
DRAWN	CADD
JOB	20210099
SHEET	E1.1

SHEET NOTES

1. DEMOLISH ELECTRICAL EQUIPMENT FROM (E) HV-UNITS PER DEMOLITION NOTES ON SHEET E0.1. SALVAGE (E) CONDUIT HOMERUN TO ELECTRICAL ROOM FOR REUSE; SEE SHEET E4.2 FOR NEW CIRCUITING INFORMATION.
2. SALVAGE (E) CONDUIT & CONTROL WIRING CONNECTION TO BOILER ROOM FOR NEW CONTROL WIRING RACEWAY.



8' 0' 2' 4' 6' 8'
SCALE: 1/8"=1'-0"

NORTH

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ROUNDTREE FACILITY
ROOFTOP UNIT REPLACEMENT

SANTA CRUZ COUNTY
90 ROUNDTREE LANE
WATSONVILLE, CA 95073

ELECTRICAL DEMOLITION PLAN - ROOF

DATE	11/19/21
SCALE	
DRAWN	CADD
JOB	20210099
SHEET	E3.1

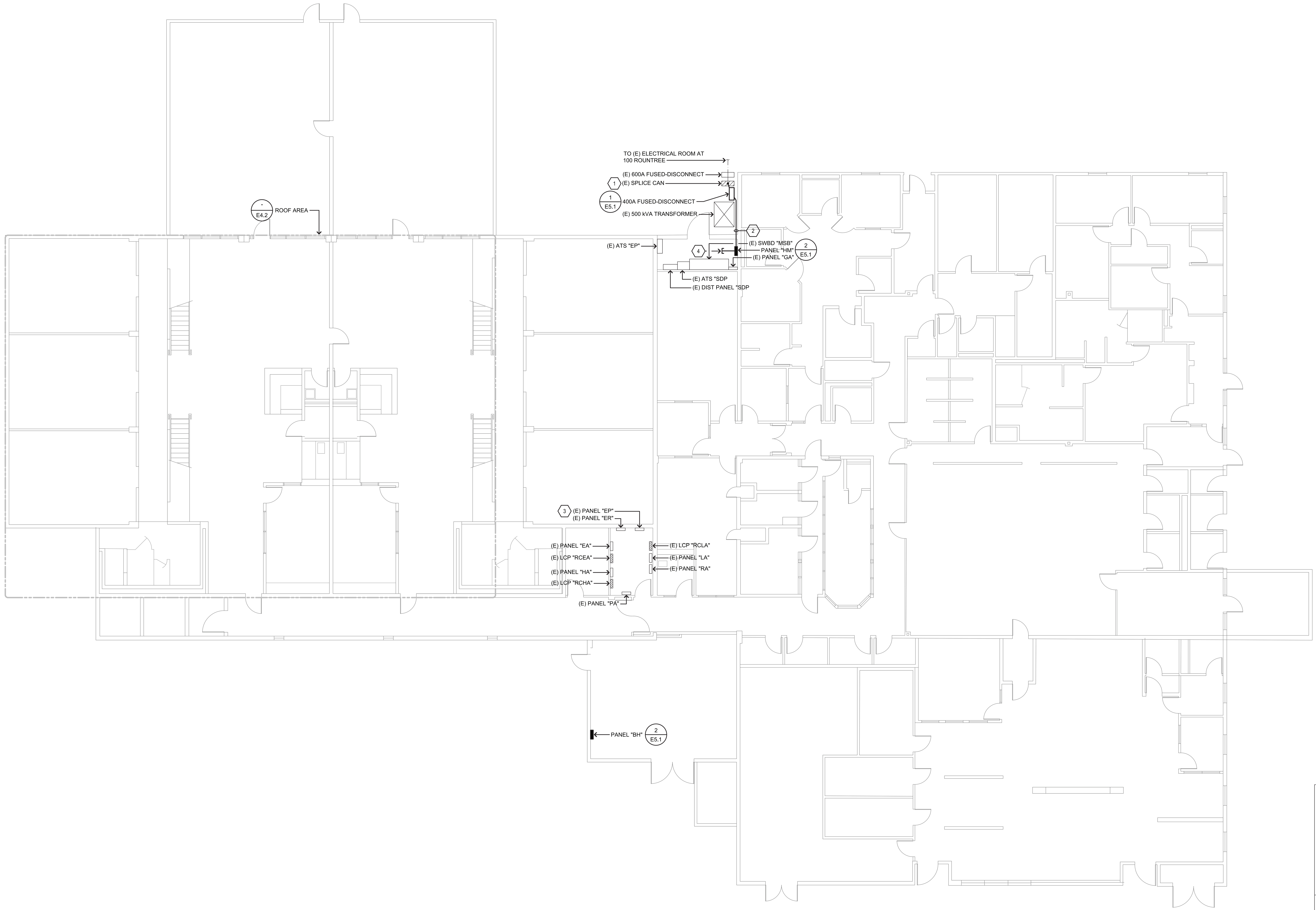
BRANCH CIRCUIT CONDUCTOR SIZING TABLE

CIRCUIT AMPACITY/VOLTAGE	CIRCUIT LENGTH	REQUIREMENT
20/120	56'-90'	½" C., 2 #10 & 1 #10 GND.
20/120	91'-140'	½" C., 2 #8 & 1 #10 GND.
20/277	131'-205'	½" C., 2 #10 & 1 #10 GND.
20/277	206'-330'	½" C., 2 #8 & 1 #10 GND.

NOTE:
CONTRACTOR SHALL SIZE BRANCH CIRCUIT CONDUCTORS PER THE TABLE ABOVE AS DETERMINED BY THE CIRCUIT CONDUCTOR LENGTH, U.O.N. CONTRACTOR SHALL SPLICE TO #12 AWG WITHIN TERMINATION BOX FOR DEVICE CONNECTION IF NECESSARY.

SHEET NOTES

1. SPLICE FEEDER AND EXTEND TO NEW 400A FUSED DISCONNECT; SEE SHEET E1.1 FOR ADDITIONAL INSTRUCTIONS.
2. SEE SHEET E1.1 FOR FEEDER SIZE AND REQUIREMENTS.
3. REMOVE (E) AH-UNIT CIRCUITS PER SHEET E3.1 AND SALVAGE (E) CONDUITS FOR REUSE. SEE SHEET E5.1 FOR NEW BREAKER REQUIREMENTS.
4. STUB (5) 1" C. ONTO ROOF ABOVE ELECTRICAL ROOM; CAP & LABEL CONDUITS AS 'SPARE'.



8' 0' 2' 4' 6' 8'
SCALE: 1/8"=1'-0"

NORTH

REGISTERED PROFESSIONAL ENGINEER
CURTIS J. TAYLOR
No. E23019
EXP. 12/31/21
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ROUNDTREE FACILITY
ROOFTOP UNIT REPLACEMENT

SANTA CRUZ COUNTY
90 ROUNDTREE LANE
WATSONVILLE, CA 95073

POWER & SYSTEMS - FIRST FLOOR

DATE	11/19/21
SCALE	
DRAWN	CADD
JOB	20210099
SHEET	E4.1

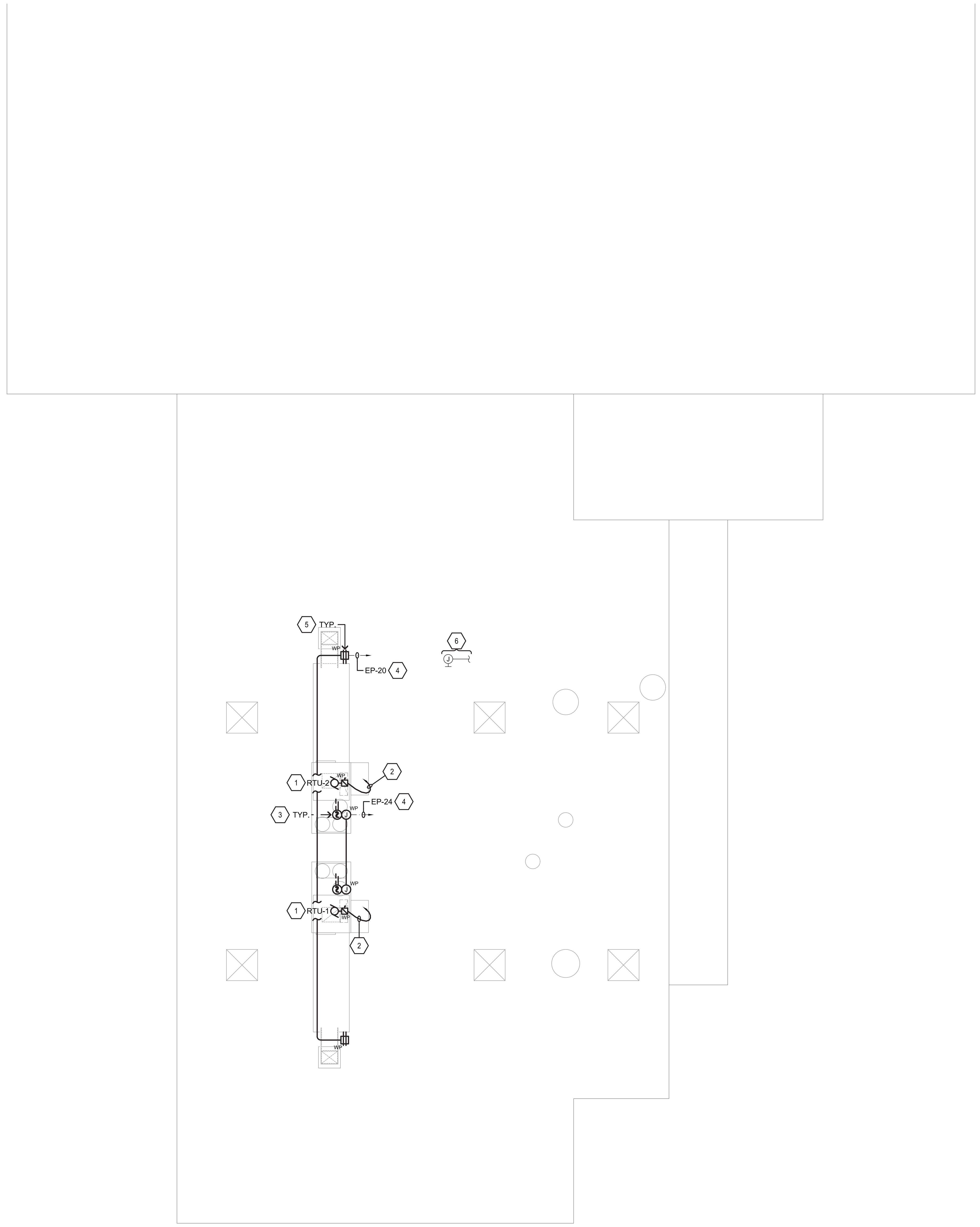
BRANCH CIRCUIT CONDUCTOR SIZING TABLE

CIRCUIT AMPACITY/VOLTAGE	CIRCUIT LENGTH	REQUIREMENT
20/120	56'-90'	½" C., 2 #10 & 1 #10 GND.
20/120	91'-140'	½" C., 2 #8 & 1 #10 GND.
20/277	131'-205'	½" C., 2 #10 & 1 #10 GND.
20/277	206'-330'	½" C., 2 #8 & 1 #10 GND.

NOTE:
CONTRACTOR SHALL SIZE BRANCH CIRCUIT CONDUCTORS PER THE TABLE ABOVE AS DETERMINED BY THE CIRCUIT CONDUCTOR LENGTH, U.O.N. CONTRACTOR SHALL SPLICE TO #12 AWG WITHIN TERMINATION BOX FOR DEVICE CONNECTION IF NECESSARY.

SHEET NOTES

1. 480V, 3Ø; XX.XMCA. PROVIDE STAINLESS STEEL DISCONNECT.
2. SEE SHEET E1.1 FOR FEEDER SIZE AND REQUIREMENTS; ROUTE FEEDER ON ROOF.
3. LOCATED IN DUCT WORK AT FIRE RATED PENETRATION. DUCT SMOKE DETECTOR AND RELAY MODULE PROVIDED BY FIRE ALARM CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR; DUCT SMOKE DETECTOR AND RELAY MODULE SHALL BE COMPATIBLE WITH FIRE ALARM SYSTEM. LOCATED WITHIN 3' OF UNIT BEING CONTROLLED. FIRE ALARM CONTRACTOR SHALL CONNECT DUCT SMOKE DETECTOR AND PROGRAM FIRE ALARM PANEL TO SHUT DOWN UNIT UPON DETECTION OF SMOKE AND SHALL ACTIVATE FIRE ALARM SYSTEM. HVAC UNIT SHUTOFF CONTROL WIRING SHALL BE SUPPLIED AND INSTALLED BY MECHANICAL CONTRACTOR. 120V WIRING SHALL BE SUPPLIED AND INSTALLED BY ELECTRICAL CONTRACTOR. CONTRACTOR SHALL VERIFY EXACT QUANTITY REQUIRED WITH MECHANICAL DRAWINGS AND COORDINATE CONNECTION WITH MECHANICAL CONTRACTOR AND ELECTRICAL CONTRACTOR.
4. 2 #12 & 1 #12 GND INSTALLED IN (E) SALVAGED RTU CONDUIT TO ELECTRICAL ROOM; SEE SHEET E4.1 FOR ELECTRICAL ROOM LOCATION.
5. WEATHER-RESISTANT GFCI RECEPTACLE MOUNTED IN 'FS' BOX WITH WHILE-IN-USE COVER, TAYMAC OR EQUAL.
6. (E) CONTROL CONDUIT & WIRING TO BOILER ROOM. CONTRACTOR SHALL EXTEND CONDUIT AND INSTALL NEW WIRING AS REQUIRED.



SCALE: 1/8"=1'-0"

NORTH

REGISTERED PROFESSIONAL ENGINEER
CURTIS J. TAYLOR
No. E23019
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ROUNDTREE FACILITY
ROOFTOP UNIT REPLACEMENT
SANTA CRUZ COUNTY
90 ROUNDTREE LANE
WATSONVILLE, CA 95073

ELECTRICAL PLAN - ROOF

DATE	11/19/21
SCALE	
DRAWN	CADD
JOB	20210099
SHEET	E4.2

PANELBOARD SCHEDULES

PANEL MH [1] [2]

Voltage:	277/480V,3ø	Bussing:	400A
Wire:	4W	Feed:	TOP
Type:	NEMA 1	Mounting:	SURFACE
Mains:	M.L.O.	A.I.C.	22,000

Load	A	B	C	Bkr	Ck	Ck	Bkr	A	B	C	Load
RTU-1	9356				1	2					PANEL BH
RTU-1		9356		45/3	3	4	100/3				PANEL BH
RTU-1			9356		5	6					PANEL BH
RTU-2	9356				7	8					SPARE
RTU-2		9356		45/3	9	10	20/3				SPARE
RTU-2			9356		11	12					SPARE
SPARE					13	14					SPARE
SPARE				45/3	15	16	15/3				SPARE
SPARE					17	18					SPARE
SPARE					19	20					SPARE
SPARE				45/3	21	22	15/3				SPARE
SPARE					23	24					SPARE
SPARE					25	26	-				SPACE ONLY
SPARE				45/3	27	28	-				SPACE ONLY
SPARE					29	30	-				SPACE ONLY
SPARE					31	32	-				SPACE ONLY
SPARE				45/3	33	34	-				SPACE ONLY
SPARE					35	36	-				SPACE ONLY
SPACE ONLY				-	37	38	-				SPACE ONLY
SPACE ONLY				-	39	40	-				SPACE ONLY
SPACE ONLY				-	41	42	-				SPACE ONLY
	18712	18712	18712					0	0	0	

1. SUBMITTAL SHALL MATCH EXACT BREAKER LOCATIONS SHOWN.
2. LABEL PANEL FOR SHORT CIRCUIT AMPS AVAILABLE PER CEC 110-24.

KVA Phase A	18.7
KVA Phase B	18.7
KVA Phase C	18.7
Total Connected Load KVA	56.1
Total Load Amperes	67

REVISED PANEL EP [1] [2]

Voltage:	120/208V,3ø	Bussing:	225A
Wire:	4W	Feed:	BOTTOM
Type:	NEMA 1	Mounting:	SURFACE
Mains:	M.L.O.	A.I.C.	MATCH (E)

Note	Load	A	B	C	Bkr	Ck	Ck	Bkr	A	B	C	Load	Note
	EF-13	400				1	2		400			EF-14	
	EF-13		400		15/3	3	4	15/3		400		EF-14	
	EF-13			400		5	6				400	EF-14	
	P-1	900				7	8		900			P-2	
	P-1		900		15/3	9	10	15/3		900		P-2	
	P-1			900		11	12				900	P-2	
	HV-4 RETURN	400				13	14		400			HV-6 RETURN	
	HV-4 RETURN		400		15/3	15	16	15/3		400		HV-6 RETURN	
	HV-4 RETURN			400		17	18				400	HV-6 RETURN	
4	SPARE				20/1	19	20	20/1	360			RECEPT- ROOF	3
4	SPARE				20/1	21	22	20/1				LTG - RTU	3
4	SPARE				20/1	23	24	20/1			200	FSD	3 5
	HV-4 SUPPLY	1300				25	26		1300			HV-6 SUPPLY	
	HV-4 SUPPLY		1300		20/3	27	28	20/3		1300		HV-6 SUPPLY	
	HV-4 SUPPLY			1300		29	30				1300	HV-6 SUPPLY	
	SPARE					31	32					SPARE	
	SPARE				15/3	33	34	15/3				SPARE	
	SPARE					35	36					SPARE	
	SURGE PROTECTOR	2000				37	38	-				SPACE ONLY	
	SURGE PROTECTOR		2000		40/3	39	40	60/2		3200		SECURITY UPS	
	SURGE PROTECTOR			2000		41	42				3200	SECURITY UPS	
		5000	5000	5000					3360	6200	6400		

1. U.O.N. ALL BREAKERS AND LOADS ARE EXISTING.
2. PROVIDE NEW TYPED DIRECTORY.
3. NEW BREAKER AND NEW LOAD.
4. NEW BREAKER AND LABEL AS SPARE.
5. PROVIDE NEW LOCK-ON DEVICE WITH RED HANDLE.

KVA Phase A	8.4
KVA Phase B	11.2
KVA Phase C	11.4
Total Connected Load KVA	31.0
Total Load Amperes	86

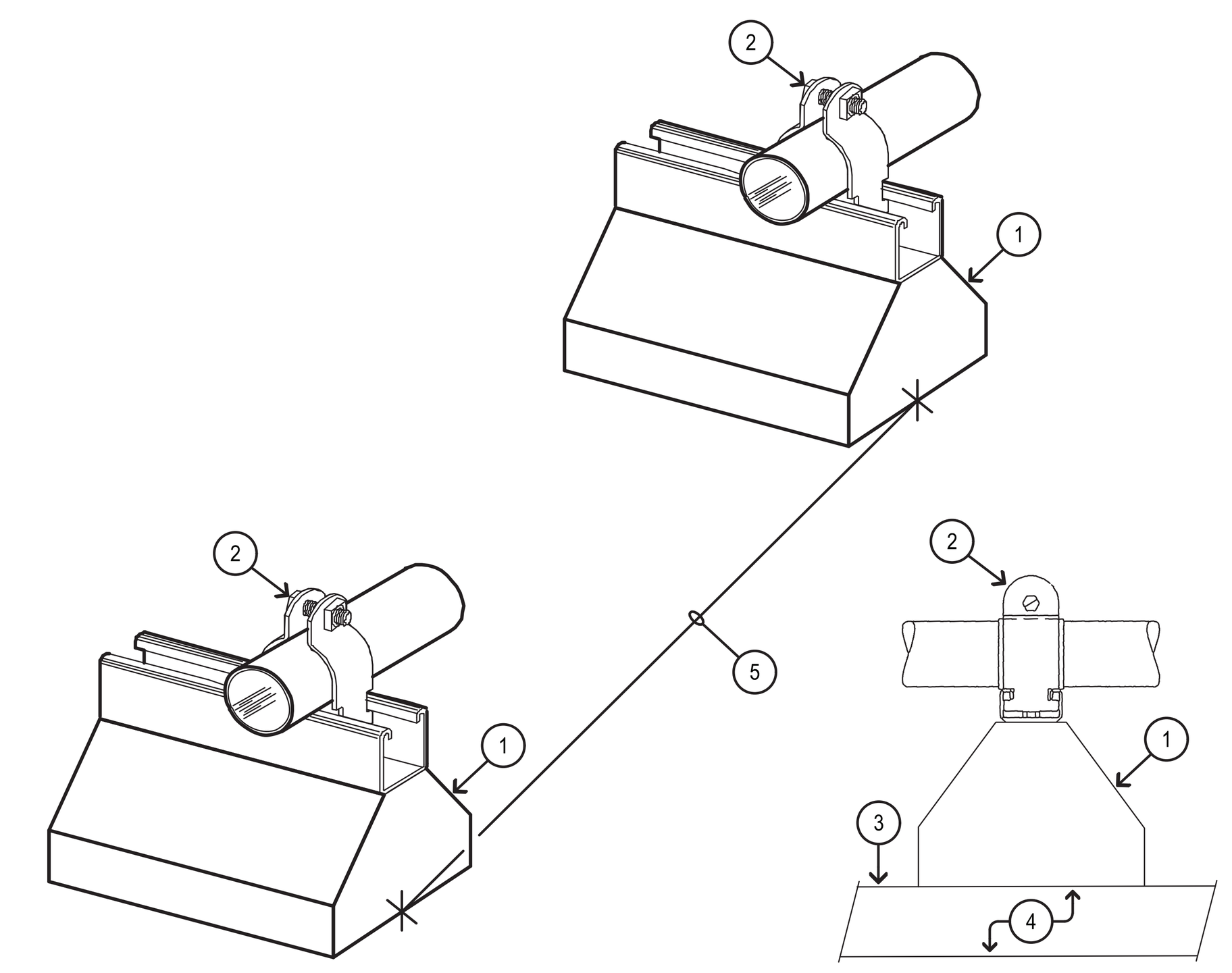
(E) PANEL EP [1]

Voltage:	120/208V,3ø	Bussing:	225A
Wire:	4W	Feed:	BOTTOM
Type:	NEMA 1	Mounting:	SURFACE
Mains:	M.L.O.	A.I.C.	MATCH (E)

Note	Load	A	B	C	Bkr	Ck	Ck	Bkr	A	B	C	Load	Note
	EF-13	400				1	2		400			EF-14	
	EF-13		400		15/3	3	4	15/3		400		EF-14	
	EF-13			400		5	6				400	EF-14	
	P-1	900				7	8		900			P-2	
	P-1		900		15/3	9	10	15/3		900		P-2	
	P-1			900		11	12				900	P-2	
	HV-4 RETURN	400				13	14		400			HV-6 RETURN	
	HV-4 RETURN		400		15/3	15	16	15/3		400		HV-6 RETURN	
	HV-4 RETURN			400		17	18				400	HV-6 RETURN	
3	HV-2 RETURN	2000				19	20		2000			HV-1 RETURN	3
3	HV-2 RETURN		2000		40/3	21	22	40/3		2000		HV-1 RETURN	3
3	HV-2 RETURN			2000		23	24				2000	HV-1 RETURN	3
	HV-4 SUPPLY	1300				25	26		1300			HV-6 SUPPLY	
	HV-4 SUPPLY		1300		20/3	27	28	20/3		1300		HV-6 SUPPLY	
	HV-4 SUPPLY			1300		29	30				1300	HV-6 SUPPLY	
2	HV-2 SUPPLY	900				31	32		900			HV-1 SUPPLY	2
2	HV-2 SUPPLY		900		15/3	33	34	15/3		900		HV-1 SUPPLY	2
2	HV-2 SUPPLY			900		35	36				900	HV-1 SUPPLY	2
	SURGE PROTECTOR	2000				37	38	-				SPACE ONLY	
	SURGE PROTECTOR		2000		40/3	39	40	60/2		3200		SECURITY UPS	
	SURGE PROTECTOR			2000		41	42				3200	SECURITY UPS	
		7900	7900	7900					5900	9100	9100		

1. U.O.N. ALL BREAKERS AND LOADS ARE EXISTING AND SHALL REMAIN.
2. REMOVE LOAD ONLY PER GENERAL DEMO NOTES ON SHEET E0.1.
3. REMOVE BREAKER AND LOAD PER GENERAL DEMO NOTES ON SHEET E0.1.

KVA Phase A	13.8
KVA Phase B	17.0
KVA Phase C	17.0
Total Connected Load KVA	47.8
Total Load Amperes	133

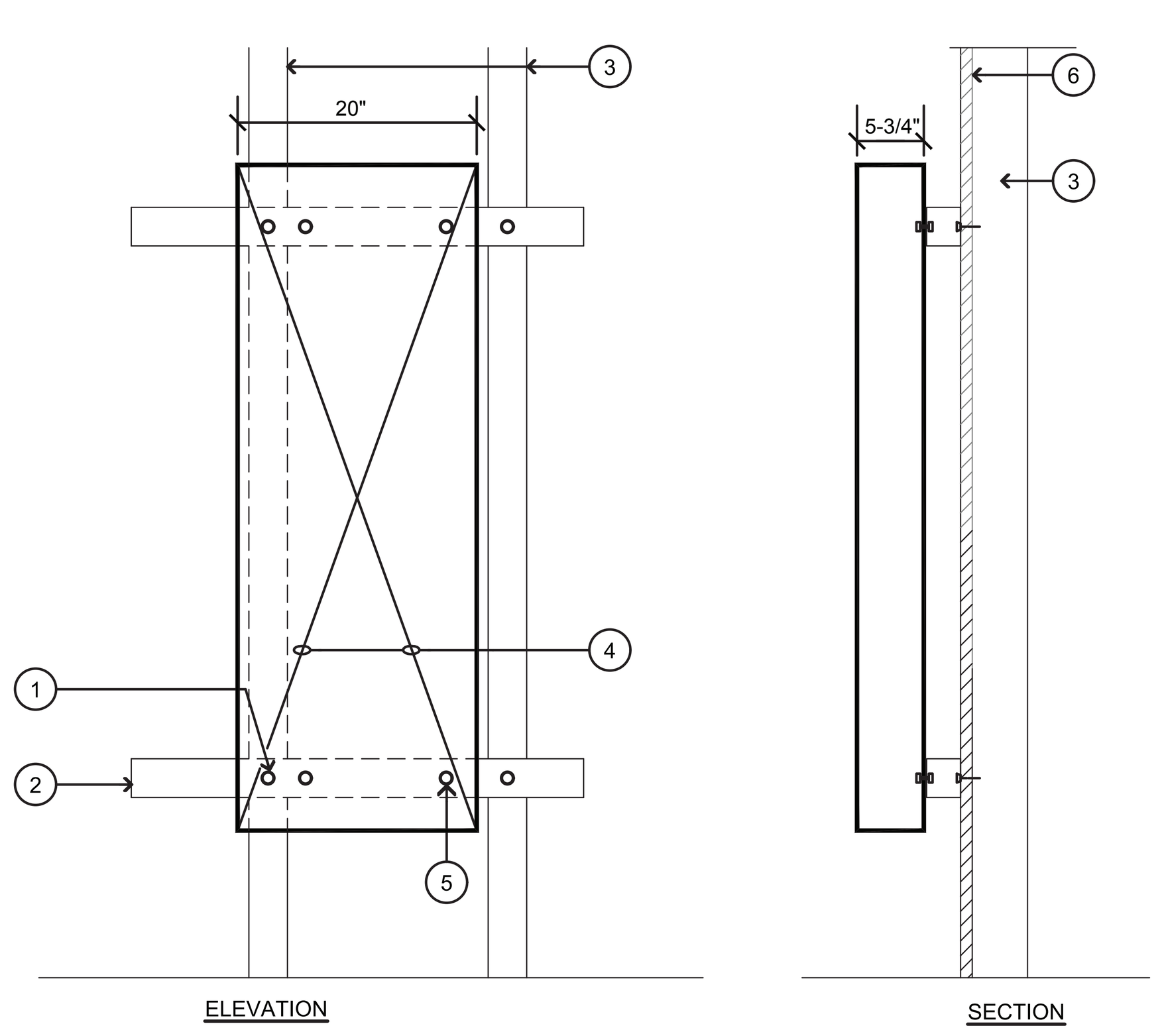


DETAIL NOTES:

1. ROOF TOP CONDUIT SUPPORT; 5" x 6" x 9.5" WITH 1" HIGH 14 GA. GALVANIZED CHANNEL STRUT. COOPER B-LINE "DB" SERIES.
2. 14 GA. RIGID CONDUIT CLAMP WITH RECESS HEX HEAD MACHINE SCREW AND SQUARE NUT COMBINATION. COPPER B-LINE B200 SERIES.
3. CLEAN (E) ROOF AREA AS REQUIRED.
4. ROOF STRUCTURE.
5. PROVIDE AND INSTALL CONDUIT SUPPORT PER CEC REQUIREMENTS.

3 ROOF MOUNTED CONDUIT SUPPORT DETAIL

NO SCALE

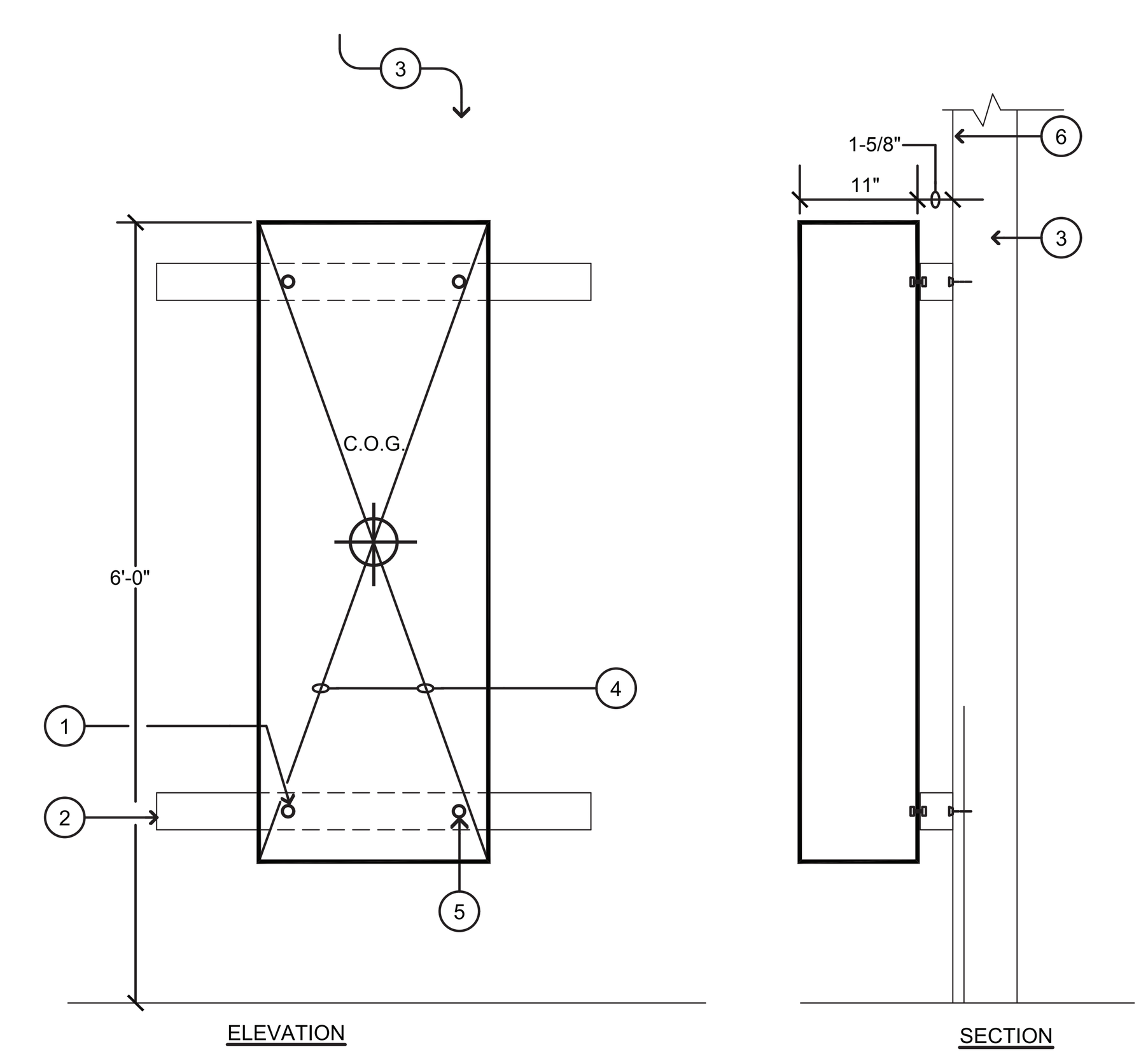


DETAIL NOTES:

1. #12 SMS, (4) TOTAL.
2. UNISTRUT P1000, TYP.
3. EXISTING METAL STUDS
4. PANEL MAXIMUM WT. 200 LBS
5. 3/8"-15 X 1 1/8"L UNISTRUT STUD NUTS W/FLAT WASHER & HEX NUT, TYP. (4)/PANEL
6. FACE OF WALL

2 WALL MOUNTED PANEL - MOUNTING DETAIL (EXISTING METAL STUD WALL)

NO SCALE



DETAIL NOTES:

1. ANCHOR BOLT - ½" DIA. HILTI KWIK BOLT-TZ2 (TYP. OF 4). 2" EMBEDMENT.
2. UNISTRUT P1000, TYP.
3. (E) EXTERIOR CONCRETE WALL
4. DISCONNECT APPROXIMATE WT. 200 LBS
5. 3/8"-15 X 1 1/8"L UNISTRUT STUD NUTS W/FLAT WASHER & HEX NUT, TYP. (4)/PANEL
6. FACE OF WALL

1 WALL MOUNTED DISCONNECT - MOUNTING DETAIL (EXISTING CONCRETE WALL)

NO SCALE

FOR PLAN CHECK ONLY

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AE Project # 20210099

REVISIONS | DATE

ROUNDTREE FACILITY
ROOFTOP UNIT REPLACEMENT
SANTA CRUZ COUNTY
90 ROUNDTREE LANE
WATSONVILLE, CA 95073

ELECTRICAL DETAILS & PANELBOARD SCHEDULES

DATE 11/19/21
DRAWN CADD
JOB 20210099
SHEET E5.1

SECTION 26 05 00

GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 Description of Work:
A. Furnish and install all required in-place equipment, conduits, conductors, cables and any miscellaneous materials for the satisfactory interconnection and operation of all associated electrical systems.

1.02 Submittals:
A. As specified in Division 1. Submit to the Architect shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system specified. Information to be submitted includes manufacturer's descriptive literature of cataloged products, equipment, drawings, diagrams, performance and characteristic curves as applicable, test data and catalog cuts. Obtain written approval before procurement, fabrication, or delivery of the items to the job site.
B. Proposed substitutions of products will not be reviewed or approved prior to awarding of the Contract.
C. Substitutions shall be proven to the Architect or Engineer to be equal or superior to the specified product. Architect's decision is final. The Contractor shall pay all costs incurred by the Architect and Engineer in reviewing and processing any proposed substitutions whether or not a proposed substitution is accepted.
D. If a proposed substitution is rejected, the contractor shall furnish the specified product at no increase in contract price.
E. If a proposed substitution is accepted, the contractor shall be completely responsible for all dimensional changes, electrical changes, or changes to other work which are a result of the substitution. The accepted substitution shall be made at no additional cost to the owner or design consultants.

1.03 Quality Assurance:
A. Codes: All electrical equipment and materials, including installation and testing, shall conform to the latest editions of the following applicable codes:
1. California Electrical Code (CEC).
2. Occupational Safety and Health Act (OSHA) standards.
3. All applicable local codes, rules and regulations.
4. Electrical Contractor shall posses a C-10 license and all other licenses as may be required. Licenses shall be in effect at start of this contract and be maintained throughout the duration of this contract.
B. Variances: In instances where two or more codes are at variance, the most restrictive requirement shall apply.
C. Standards: Equipment shall conform to applicable standards of American National Standards Institute (ANSI), Electronics Industries Association (EIA), Institute of Electrical and Electronics Engineers (IEEE), and National Electrical Manufacturers Association (NEMA).
D. Underwriter Laboratories (UL) listing is required for all equipment and materials where such listing is offered by the Underwriters Laboratories. Provide service entrance labels for all equipment required by the NEC to have such labels.
E. The electrical contractor shall guarantee all work and materials installed under this contract for a period of one (1) year from date of acceptance by owner.
F. All work and materials covered by this specification shall be subject to inspection at any and all times by representatives of the owner. Work shall not be closed in or covered before inspection and approval by the owner or his representative. Any material found not conforming with these specifications shall, within 3 days after being notified by the owner, be removed from premises; if said material has been installed, entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by the contractor.

1.04 Contract Documents:
A. Drawings: The Electrical Drawings shall govern the general layout of the completed construction.
1. Locations of equipment, panels, pullboxes, conduits, stub-ups, ground connections are approximate unless dimensioned; verify locations with the Architect prior to installation.
2. The general arrangement and location of existing conduits, piping, apparatus, etc., is approximate. The drawings and specifications are for the assistance and guidance of the contractor, exact locations, distances and elevations are governed by actual field conditions. Accuracy of data given herein and on the drawings is not guaranteed. Minor changes may be necessary to accommodate work. The contractor is responsible for verifying existing conditions. Should it be necessary to deviate from the design due to interference with existing conditions or work in progress, claims for additional compensation shall be limited to those for work required by unforeseen conditions as determined by the Architect.
3. All drawings and divisions of these specifications shall be considered as whole. The contractor shall report any apparent discrepancies to the Architect prior to submitting bids.
4. The contractor shall be held responsible to have examined the site and compared it with the specifications and plans and to have satisfied himself as to the conditions under which the work is to be performed. He shall be held responsible for knowledge of all existing conditions whether or not accurately described. No subsequent allowance shall be made for any extra expense due to failure to make such examination.

1.05 Closeout Submittals:
A. Manuals: Furnish manuals for equipment where manuals are specified in the equipment specifications or are specified in Division 1.

1.06 Coordination:
A. Coordinate the electrical work with the other trades, code authorities, utilities and the Architect.
B. Contractor shall pay all inspection and other applicable fees and procure all permits necessary for the completion of this work.
C. Where connections must be made to existing installations, properly schedule all the required work, including the power shutdown periods.
D. When two trades join together in an area, make certain that no electrical work is omitted.

1.07 Job Conditions:
A. Operations: Perform all work in compliance with Division 1
1. Keep the number and duration of power shutdown periods to a minimum.
2. Show all proposed shutdowns and their expected duration on the construction schedule. Schedule and carry out shutdowns so as to cause the least disruption to operation of the Owner's facilities.
3. Carry out shutdown only after the schedule has been approved, in writing, by the owner. Submit power interruption schedule 15 days prior to date of interruption.
B. Construction Power: Unless otherwise noted in Division 1 of these specifications, contractor shall make all arrangements and provide all necessary facilities for temporary construction power [from the owner's on site source. Energy costs shall be paid for by the Owner.] [to the site. Energy costs shall be paid by the General Contractor.]

1.08 Safety and Indemnity:
A. The Contractor is solely and completely responsible for conditions of the job site including safety of all persons and property during performance of the work. This requirement will apply continually and not be limited to normal working hours. The contractor shall provide and maintain throughout the work site proper safeguards including, but not limited to, enclosures, barriers, warning signs, lights, etc. to prevent accidental injury to people or damage to property.
B. The Contractor performing work under this Division of the Specifications shall hold harmless, indemnify, and defend the Owner, the Engineer, their consultants, and each of their officers, agents and employees from any and all liability claims, losses, or damage arising out of or alleged to arise from bodily injury, sickness, or death of a person or persons and for all damages arising out of injury to or destruction of property arising directly or indirectly out of or in connection with the performance of the work under this Division of the Specifications, and from the Contractor's negligence in the performance of the work described in the construction contract documents, but not including liability that may be due to the sole negligence of the Owner, the Engineer, their Consultants or their officers, agents and employees.
C. If a work area is encountered that contains hazardous materials, the contractor is advised to coordinate with the owner and it's abatement consultant for abatement of hazardous material by the Owner's Representative. "Hazardous materials" means any toxic substance regulated or controlled by OSHA, EPA, State of California or local rules, regulations and laws. Nothing herein shall be construed to create a liability for Aurum Consulting Engineers regarding hazardous materials abatement measures, or discovery of hazardous materials.

1.09 Access Doors:
A. The contractor shall install access panels as required where floors, walls or ceilings must be penetrated for access to electrical, control, fire alarm or other specified electrical devices. The minimum size panel shall be 14" x 14" in usable opening. Where access by a service person is required, minimum usable opening shall be 18" x 24".

1.10 Arc Flash:
A. The contractor shall install a clearly visible arc flash warning to the inside door of all panelboards and industrial control panels, as well as to the front of all switchboards and motor control centers that are a part of this project.
B. The warning shall have the following wording: line 1 "WARNING" (in large letters), line 2 "Potential Arc Flash Hazard" (in medium letters), line 3 & 4 "Appropriate Personal Protective Equipment and Tools required when working on this equipment".

1.11 All boxes and enclosures for emergency circuits shall be permanently marked with a readily visible red spray painted mark.

PART 2 - PRODUCTS

2.01 Nameplates:
A. Identify each piece of equipment and related controls with a rigid laminated engraved plastic nameplate. Unless otherwise noted, nameplates shall be melamine plastic 0.125 inch thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be 0.5 by 2.5 inches unless otherwise noted. Where not otherwise specified, lettering shall be a minimum of 0.25 inch high normal block style. Engrave nameplates with the inscriptions indicated on the Drawings and, if not so indicated, with the equipment name. Securely fasten nameplates in place using two stainless steel or brass screws.

2.02 Finish requirements:
A. Equipment: Refer to each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish which has been damaged or is otherwise unsatisfactory, to the satisfaction of the Architect.
B. Wiring System: In finished areas, paint all exposed conduits, boxes and fittings to match the color of the surface to which they are affixed.

PART 3 - EXECUTION

3.01 Workmanship:
A. All electrical equipment and materials shall be installed in a neat and workmanship manner in accordance with the "NECA-1 Standard Practices For Good Workmanship in Electrical Contracting". Workmanship of the entire job shall be first class in every respect.

3.02 Equipment Installations:
A. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.
B. Do all the cutting and patching necessary for the proper installation work and repair any damage done.
C. Earthquake restraints: all electrical equipment, including conduits over 2 inches in diameter, shall be braced or anchored to resist a horizontal force acting in any direction as per CBC Section 1616A Title 24, part 2 and ASCE7-10, section 13.3 and 13.6 and table 13.6-1.
D. Structural work: All core drilling, bolt anchor insertion, or cutting of existing structural concrete shall be approved by a California registered structural consulting engineer prior to the execution of any construction. At all floor slabs and structural concrete walls to be drilled, cut or bolt anchors inserted, the contractor shall find and mark all reinforcing in both faces located by means of x-ray, pach-ometer, or prof-ometer. Submit sketch showing location of rebar and proposed cuts, cores, or bolt anchor locations for approval.

3.03 Field Test:
A. Perform equipment field tests and adjustments. Properly calibrate, adjust and operationally check all circuits and components, and demonstrate as ready for service.
B. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed and adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation, including alarm conditions.

3.04 Records:
A. Maintain one copy of the contract Drawing Sheets on the site of the work for recording the "as built" condition. After completion of the work, the Contractor shall carefully mark the work as actually constructed, revising, deleting and adding to the Drawing Sheets as required. As built Drawings shall be delivered to the Architect within ten (10) days of completion of construction.

3.05 Clean Up:
A. Upon completion of electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the Architect.

3.06 Mechanical and Plumbing Electrical Work:
A. The requirements for electrical power and/or devices for all mechanical and plumbing equipment supplied and/or installed under this Contract shall be coordinated and verified with the following:
1. Mechanical and Plumbing Drawings.
2. Mechanical and Plumbing sections of these Specifications.
3. Manufacturers of the Mechanical and Plumbing equipment supplied.
B. The coordination and verification shall include the voltage, ampacity, phase, location and type of disconnect, control, and connection required. Any changes that are required as a result of this coordination and verification shall be a part of this Contract.
C. The Electrical Contractor shall furnish and install the following for all mechanical and plumbing equipment:
1. Line voltage conduit and wiring.
2. Disconnect switches.
3. Manual line motor starters.
D. Automatic line voltage controls and magnetic starters shall be furnished by the Mechanical and/or Plumbing Contractor and installed and connected by the Electrical Contractor. When subcontracted for by the Mechanical and/or Plumbing Contractor, all line voltage control wiring installed by the Electrical Contractor shall be done per directions from the Mechanical and/or Plumbing Contractor.
E. All low voltage control wiring for Mechanical and Plumbing equipment shall be installed in conduit. Furnishing, installation and connection of all low voltage conduit, boxes, wiring and controls shall be by the Mechanical and/or Plumbing Contractor.
F. Manual motor starters, where required, shall have toggle type operators with pilot light and melting alloy type overload relays, SQUARE D COMPANY, Class 2510, Type FG-1P (surface) or Type FS-1P (flush) or ITE, WESTINGHOUSE or GENERAL ELECTRIC equal.

SECTION 26 05 26

GROUNDING

PART 1 - EXECUTION

1.1 Grounding and Bonding:
A. Grounding and bonding shall be as required by codes and local authorities.
B. All electrical equipment shall be grounded, including, but not limited to, panel boards, terminal cabinets and outlet boxes.
C. The ground pole of receptacles shall be connected to their outlet boxes by means of a copper ground wire connecting to a screw in the back of the box.
D. A green insulated copper ground wire, sized to comply with codes, shall be installed in all conduit runs.
E. All metal parts of pull boxes shall be grounded per code requirements.
F. All ground conductors shall be green insulated copper.

SECTION 26 05 42

CONDUITS, RACEWAYS AND FITTINGS

PART 1 - EXECUTION

1.01 Conduit, Raceway and Fitting Installation:
A. For conduit runs exposed to weather provide rigid metal (GRS).
B. For conduit run underground, in concrete or masonry block wall and under concrete slabs, install minimum ¾" size nonmetallic (PVC) with PVC elbows. Where conduits transition from underground or under slab to above grade install wrapped rigid metal (GRS) elbows and risers.
C. For conduit runs concealed in steel or wood framed walls or in ceiling spaces or exposed in interior spaces above six feet over the finished floor, install EMT.
D. Flexible metal conduit shall be used only for the connection of recessed lighting fixtures and motor connections unless otherwise noted on the Drawings. Liquid-tight steel flexible conduit shall be used for motor connections.
E. The minimum size raceway shall be 1/2-inch unless indicted otherwise on the Drawings.
F. Installation shall comply with the CEC.
G. From pull point to pull point, the sum of the angles of all of the bends and offset shall not exceed 360 degrees.
H. Conduit Supports: Properly support all conduits as required by the NEC. Run all conduits concealed except where otherwise shown on the drawings.
1. Exposed Conduits: Support exposed conduits within three feet of any equipment or device and at intervals not exceeding NEC requirements; wherever possible, group conduits together and support on common supports. Support exposed conduits fastened to the surface of the concrete structure by one-hole clamps, or with channels. Use conduit spacers with one-hole clamps.
a. Conduits attached to walls or columns shall be as unobtrusive as possible and shall avoid windows. Run all exposed conduits parallel or at right angles to building lines.
b. Group exposed conduits together. Arrange such conduits uniformly and neatly.
2. Support all conduits within three feet of any junction box, coupling, bend or fixture.
3. Support conduit risers in shafts with Unistrut Superstrut, or approved equal, channels and straps.
I. Moisture Seals: Provide in accordance with NEC paragraphs 230-8 and 300-5(g).
J. Where PVC conduit transitions from underground to above grade, provide rigid steel 90's with risers. Rigid steel shall be half-lap wrapped with 20 mil tape and extend minimum 12" above grade.
K. Provide a nylon pull cord in each empty raceway.
L. Provide galvanized rigid steel factory fittings for galvanized rigid steel conduit.
M. Slope all underground raceways to provide drainage; for example, slope conduit from equipment located inside a building to the pull box or manhole located outside the building.
N. Conduits shall be blown out and swabbed prior to pulling wires.

SECTION 26 05 16

LINE VOLTAGE WIRE AND CABLE

PART 1 - PRODUCTS

1.01 Conductors:
A. Conductors shall be copper, type THHN/THWN/MTW oil and gasoline resistant, 90°C, 600 volt rated insulation.
B. Conductors shall be stranded copper.
C. Minimum power and control wire size shall be No. 12 AWG unless otherwise noted.
D. All conductors used on this Project shall be of the same type and conductor material.

1.02 Terminations:
A. Manufacturer - Terminals as manufactured by T&B, Burndy or equal.
B. Wire Terminations - Stranded conductors shall be terminated in clamping type terminations which serve to contain all the strands of the conductor. Curling of a stranded conductor around a screw type terminal is not allowed. For screw type terminations, use a fork type stake-on termination on the stranded conductor. Use only a stake-on tool approved for the fork terminals selected.
C. End Seals - Heat shrink plastic caps of proper size for the wire on which used.

1.03 Tape:
A. Tape used for terminations and cable marking shall be compatible with the insulation and jacket of the cable and shall be of plastic material.

PART 2 - EXECUTION

2.01 Cable Installation:
A. Clean Raceways - Clean all raceways prior to installation of cables as specified in Section 26 05 42 - Conduits Raceway and Fittings.
B. All wiring including low voltage wiring shall be installed in conduit, U.O.N.
C. All feeder conductors shall be continuous from equipment to equipment. Splices in feeders are not permitted unless specifically noted or approved by the Electrical Engineer.
D. All branch circuit wiring shall be run concealed in ceiling spaces, walls, below floors or in crawl spaces unless noted otherwise.

2.02 Cable Terminations and Splices:
A. Splices - UL Listed wirenuts.
B. Terminations - Shall comply with the following:
1. Make up and form cable and orient terminals to minimize cable strain and stress on device being terminated on.
2. Burnish oxide from conductor prior to inserting in oxide breaking compound filled terminal.

2.03 Circuit and Conductor Identification:
A. Color Coding - Provide color coding for all circuit conductors. Insulation color shall be white for neutrals and green for grounding conductors. Conductor colors shall be as follows:

VOLTAGE	208/120V	480/277V
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Grey
Ground	Green	Green

B. Color coding shall be in the conductor insulation for all conductors #10 AWG and smaller; for larger conductors, color shall be either in the insulation or in colored plastic tape applied at every location where the conductor is readily accessible.
C. Circuit Identification - All underground distribution and service circuits shall be provided with plastic identification tags in each secondary box and at each termination. Tags shall identify the source transformer of the circuit and the building number(s) serviced by the circuit.

2.04 Field Tests:
A. All systems shall test free from short circuits and grounds, shall be free from mechanical and electrical defects, and shall show an insulation resistance between phase conductors and ground of not less than the requirements of the CEC. All circuits shall be tested for proper neutral connections.

SECTION 26 05 33

OUTLET, JUNCTION AND PULL BOXES

PART 1 - PRODUCTS

1.01 Outlet boxes, Junction and Pull boxes
A. Standard Outlet Boxes: Galvanized, steel, knock-out type of size and configuration best suited to the application indicated on the Drawings. Minimum box size shall be 4 inches square (octagon for most light fixtures) by 1-1/2 inches deep with mud rings as required. Boxes used with conduit 1" or larger shall be minimum 2" deep.
B. Switch boxes: Minimum box size shall be 4 inches square by 1-1/2 inches deep with mud rings as required. Install multiple switches in standard gang boxes with raised device covers suitable for the application indicated.
C. Conduit bodies: Cadmium plated, cast iron alloy. Conduit bodies with threaded conduit hubs and neoprene gasketed, cast iron covers. Bodies shall be used to facilitate pulling of conductors or to make changes in conduit direction only. Splices are not permitted in conduit bodies. Crouse-Hinds Form 8 Condulets, Appleton Form 35 Unilets or equal.
D. Sheet Metal Boxes: Use standard outlet or concrete ring boxes wherever possible; otherwise use a minimum 16 gauge galvanized sheet metal, NEMA I box sized to Code requirements with covers secured by cadmium plated machine screws located six inches on centers. Circle AW Products, Hoffman Engineering Company or equal.
E. Flush Mounted Pull boxes and Junction boxes: Provide overlapping covers with flush head cover retaining screws, prime coated.

PART 2 - EXECUTION

2.01 Outlet Boxes
A. General:
1. All outlet boxes shall finish flush with building walls, ceilings and floors except in mechanical and electrical rooms above accessible ceiling or where exposed work is called for on the Drawings.
2. Install raised device covers (plaster rings) on all switch and receptacle outlet boxes installed in masonry or stud walls or in furred, suspended or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.
3. Leave no unused openings in any box. Install close-up plugs as required to seal openings.
B. Box Layout:
1. Outlet boxes shall be installed at the locations and elevations shown on the drawings or specified herein. Make adjustments to locations as required by structural conditions and to suit coordination requirements of other trades.
2. Locate switch outlet boxes on the latch side of doorways.
3. Outlet boxes shall not be installed back to back nor shall through-wall boxes be permitted. Outlet boxes on opposite sides of a common wall shall be separated horizontally by at least one stud or vertical structural member.
4. For outlets mounted above counters, benches or backsplashes, coordinate location and mounting heights with built-in units. Adjust mounting height to agree with required location for equipment served.
5. On fire rated walls, the total face area of the outlet boxes shall not exceed 100 square inches per 100 square feet of wall area.
C. Supports:
1. Outlet Boxes installed in metal stud walls shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.
2. Fixture outlet boxes installed in suspended ceiling of gypsum board or lath and plaster construction shall be mounted to 16 gauge metal channel bars attached to main ceiling runners.
3. Fixture outlet boxes installed in suspended ceilings supporting acoustical tiles or panels shall be supported directly from the structure above where pendant mounted lighting fixture are to be installed on the box.
4. Fixture Boxes above tile ceilings having exposed suspension systems shall be supported directly from the structure above.
5. Outlet and / or junction boxes shall not be supported by grid or fixture hanger wires at any locations.

2.02 Junction And Pull Boxes
A. General:
1. Install junction or pull boxes where required to limit bends in conduit runs to not more than 360 degrees or where pulling tension achieved would exceed the maximum allowable for the cable to be installed. Note that these boxes are not shown on the Drawings.
2. Locate pull boxes and junction boxes in concealed locations above accessible ceilings or exposed in electrical rooms, utility rooms or storage areas.
3. Install raised covers (plaster rings) on boxes in stud walls or in furred, suspended or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.
4. Leave no unused openings in any box. Install close-up plugs as required to seal openings.
5. Identify circuit numbers and panel on cover of junction box with black marker pen.
B. Box Layouts:
1. Boxes above hung ceilings having concealed suspension systems shall be located adjacent to openings for removable recessed lighting fixtures.
C. Supports:
1. Boxes installed in metal stud walls shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.
2. Boxes installed in suspended ceilings of gypsum board or lath and plaster construction shall be mounted to 16 gauge metal channel bars attached to main ceiling runners.
3. Boxes installed in suspended ceilings supporting acoustical tiles or panels shall be supported directly from the structure above.
4. Boxes mounted above suspended acoustical tile ceilings having exposed suspension systems shall be supported directly from the structure above.

SECTION 26 27 26

DEVICES WIRING

PART 1 - PRODUCTS

1.01 Receptacles:
A. General - Receptacles shall be heavy duty, high abuse, grounding type.
B. Duplex Receptacles:
1. Receptacles shall be specification grade, rated 20 ampere, two-pole, 3-wire, 120 volt, NEMA 5-20 configuration, self-grounding with screw terminals. Color shall be as selected by the Architect.
2. Devices shall have a nylon face, back and side wired.
3. Manufacturer: Hubbell #DR20 Series, Leviton #16352 Series.
C. GFCI Receptacles:
1. Device shall be rated 20 ampere, 2-pole, 3-wire, 120 volt, conforming to NEMA 5-20 configuration. Face shall be nylon composition. Unit shall have an LED type red indicator light, test and reset push buttons. Color shall be as selected by the Architect.
2. GFCI component shall meet UL 943 Class A standards with a tripping time of 1/40 second at 5 milliamperes current unbalance. Operating range shall extend from -31°F to 158°F. Unit shall have transient voltage protection and shall be ceramic encapsulated for protection against moisture.
3. Manufacturer: Hubbell #GF20_ _LA Series, Leviton #7899 Series.
D. Automatically Controlled Receptacles [Tamper Resistant]
1. Receptacles shall be specification grade, rated 20 amperes, two pole, 3-wire, 125V, NEMA 5-20 configuration, self-grounding with screw terminals. Color shall be selected by the Architect.
2. Devices shall have a nylon face, back and side wired. Marking permanently printed, molded, or stamped on the face of the receptacle and in compliance with controlled receptacle marking requirements stated in California Building Energy Efficiency Standards Section 130.5(d)(3).
3. Manufacturer: Pass & Seymour 26352_D, 26352_H (Half Switched Receptacles) [TR26352_D, TR26352_H (Half Switched Receptacles); Hubble XXX_X, XXXXX_X (Half Switched Receptacles) [TRXXX_X, TRXXX_X (Half Switched Receptacles); Leviton XXX_X, XXX_X (Half Switched Receptacles) [TRXXX_X, TRXXX_X (Half Switched Receptacles).
E. Surge Suppression Receptacles:
1. Device shall be rated 20 ampere, 2-pole, 3-wire, 120 volt. Face shall be nylon composition. Unit shall have an LED type "Power-on" indication light and damage-alert audible alarm. Color shall be as selected by the Architect.
2. Surge suppression protection shall be listed to UL standard 1449 and shall instantly absorb a transient surge of 6,000 volts minimum. A minimum of four (4) Metal Oxide Varistors shall be utilized to absorb transients.
3. Manufacturer: Hubbell #HBL8362S Series, Leviton #8380 Series.

1.02 Switches:
A. Switches shall be rated 20 amperes to 120/277 volts ac. Units shall be flush mounted, self-grounding, quiet operating toggle devices. Handle color shall be as selected by the Architect.
1. Manufacturer: Hubbell #HBL1221 Series, Leviton #1221 Series
B. Timed switches: Shall be as designed by Paragon Electric Company # ET2000f or Watt Stopper TS-400 rated for the voltage specified on drawings. Time out shall be adjustable from 5 minutes up to 12 hours. Unit shall be provided with warning alarm.

1.03 Plates:
A. General - Plates shall be of the style and color to match the wiring devices, and of the required number of gangs. Plates shall conform with NEMA WD 1 , UL 514 and FS W-P-455A. Plates on finished walls shall be non-metallic or stainless steel. Plates on unfinished walls and on fittings shall be of zinc plated steel or case metal and shall have rounded corners and beveled edges.
B. Non-Metallic: Plates shall be plain with beveled edges and shall be nylon or reinforced fiberglass.
C. Stainless Steel: Plates shall be .040 inches thick with beveled edges and shall be manufactured from No. 430 alloy having a brushed or satin finish.
D. Cast Metal: Plates shall be cast or malleable iron covers with gaskets so as to be moisture resistant or weatherproof.
E. Blank Plates: Cover plates for future telephone outlets shall match adjacent device wall plates in appearance and construction.

PART 2 - EXECUTION

2.01 Installation of Wiring Devices:
A. Interior Locations: In finished walls, install each device in a flush mounted box with washers as required to bring the device mounting strap level with the surface of the finished wall. On unfinished walls, surface mount boxes level and plumb.
B. Mounting Heights: Adjust boxes so that the front edge of the box shall not be farther back from the finished wall plane than 1/4-inch. Adjust boxes so that they do not project beyond the finished wall. Height of device shall be as follows:
1. Receptacles 15 Inches from finished floor to bottom of box unless otherwise noted on the drawings
2. Toggle Switches 48 Inches from finished floor to top of box
C. Receptacles:
1. Ground each receptacle using a grounding conductor, not a yoke or screw contact.
2. Install receptacles with connections spliced to the branch circuit wiring in such a way that removal of the receptacle will not disrupt neutral continuity and branch circuit power will not be lost to other receptacles in the same circuit.

2.02 Installation of Wall Plates:
A. General - Plates shall match the style of the device and shall be plumb within 1/16-inch of the vertical or horizontal.
B. Interior Locations, Finished Walls: Install non-metallic plates so that all four edges are in continuous contact with the finished wall surfaces. Plaster filling will not be permitted. Do not use oversized plates or sectional plates.
C. Interior Locations, Unfinished Walls: Install stainless steel or cast metal cover plates.
D. Exterior Locations: Install cast metal plates with gaskets on wiring devices in such a manner as to provide a rain tight weatherproof installation. Cover type shall match box type. Cover shall be [Lockable] outdoor extra-duty "in-use" type.
E. Future Locations: Install blank cover plates on all unused outlets.
F. Labeling: All switch and receptacle plates shall be labeled on the top portion of the plate with the panelboard and circuit number serving that device. Lettering shall be 1/16" minimum high, black color, on clear Mylar tape.

2.03 Tests:
A. Receptacles:
1. After installation of receptacles, energize circuits and test each receptacle to detect lack of ground continuity, reversed polarity, and open neutral condition.

SECTION 26 24 16

PANELBOARDS AND DISTRIBUTION PANELS

PART 1 - PRODUCTS

1.01 Panelboards:
A. General: Lighting and Receptacle Panelboards shall be the automatic circuit breaker type. The number and arrangement of circuits, trip ratings, spares and blank spaces for future circuit breakers shall be as shown on the Drawings or, if not shown, 42 circuits. All circuit breakers shall be quick-make, quick-break, thermal-magnetic, bolt-on type (unless otherwise noted on drawings), with 1, 2 or 3 poles as shown, each with a single operating handle. Tandem or piggy-back breakers shall not be used.
B. Nameplates:
1. Each panelboard shall have a field mounted identifying, rigid, plastic nameplate giving the panel identification as shown on the Drawings.
2. Each panelboard shall have a manufacturer's nameplate showing the voltage, bus rating, number of phases, frequency and number of wires.
C. Construction:
1. Door and trim shall be finished to match finish type and color of surrounding wall. Box shall be hot-dip galvanized, field finished to match the front.
2. Panelboards and enclosures shall conform to requirements of all relevant codes. Panelboards shall be suitable for use as service equipment.
3. Panelboards shall be furnished with hinged trim fronts with key latch and a typed directory card and holder. Panelboard circuits shall be arranged with odd numbers on the left and even numbers on the right. Provide weatherproof, NEMA type 3R enclosures for outdoor installation.
D. Busbars: Panelboard busbars shall be phase sequence type suitable for bolt-on circuit breakers. All busbars shall be copper.
E. Circuit Breakers: Circuit breakers shall be the molded case type with trip and interrupting ratings as shown on the Drawings.
F. Manufacturer:
1. Panelboard manufacturer shall be be Square D, Siemens or I.E.M., No other panelboard manufacturers are acceptable. Panelboards shall be of the same manufacturer as the switchboard.

1.02 Distribution Panels:
A. General: Distribution panels shall be the automatic circuit breaker type. The number and arrangement of circuits, trip ratings, spares and blank spaces for future circuit breakers shall be as shown on the Drawings. All circuit breakers shall be quick-make, quick-break, thermal-magnetic bolt-on type, with 1, 2 or 3 poles as shown, each with a single operating handle. Tandem or piggy-back breakers shall not be used.
B. Nameplates:
1. Each distribution panel shall have a field mounted, identifying, rigid, plastic nameplate giving the panel identification as shown on the Drawings.
2. Each distribution panel shall have a manufacturer's nameplate showing the voltage, bus rating, number of phases, frequency and number of wires.
C. Construction:
1. Door and trim shall be finished to match color of surrounding wall. Box shall be hot-dip galvanized, field finished to match the front.
2. Distribution panels and enclosures shall conform to requirements of all relevant codes. Distribution panels shall be suitable for use as service equipment.
3. Distribution panels shall have a front door with key latch and a typed directory card and permanently attached holder. Adhesive backed holders are not acceptable. Distribution panels circuits shall be arranged with odd numbers on the left and even numbers on the right. Provide weatherproof, NEMA type 3R enclosures for outdoor installation.
D. Busbars: Distribution panels busbars shall be phase sequence type suitable for bolt-on circuit breakers. All busbars shall be copper, sized for a maximum current density of 1000A psi.
E. Circuit Breakers: Circuit breakers shall be the molded case type with trip and interrupting ratings as shown on the Drawings.
F. Manufacturer:
1. Distribution panel manufacturer manufacturer shall be be Square D, Siemens, I.E.M. or Eaton Cutler Hammer; no other distribution panel manufacturers are acceptable. Distribution panels shall be of the same manufacturer as the switchboard.

PART 2 - EXECUTION

2.01 Mounting:
A. Panelboards and Distribution Panels shall be mounted with the top of the box 6'-6" above the floor. Panelboards and Distribution Panels shall be plumb within 1/8-inch. The highest breaker operating handle shall not be higher than 72 inches above the floor.

SECTION 26 28 16

CIRCUIT BREAKERS

PART 1 - PRODUCTS

1.01 Circuit Breaker: Each circuit breaker shall consist of the following:
A. A molded case breaker with an over center toggle-type mechanism, providing quick-make, quick-break action. Each circuit breaker shall have a permanent trip unit containing individual thermal and magnetic trip elements in each pole. Multipole circuit breakers shall have variable magnetic trip elements which are set by a single adjustment to assure uniform tripping characteristics in each pole. Circuit breakers shall be of the bolt-on type unless otherwise noted.
B. Breaker shall be calibrated for operation in an ambient temperature of 40°C.
C. Each circuit breaker shall have trip indication by handle position and shall be trip-free.
D. Three pole breakers shall be common trip.
E. The circuit breakers shall be constructed to accommodate the supply connection at either end of the circuit breaker. Circuit breaker shall be suitable for mounting and operation in any position.
F. Breakers shall be rated as shown on Drawings.
G. Circuit breaker and/or Fuse/circuit breaker combinations for series connected interrupting ratings shall be listed by UL as recognized component combinations for use in the end use equipment in which it is installed. Any series rated combination used shall be marked on the end use equipment per CEC section 110-22.
H. Breakers shall be UL listed. Circuit breakers shall have removable lugs.
I. Lugs shall be UL listed for copper and aluminum conductors.
J. Breakers shall be UL listed for installation of mechanical screw type lugs.
K. Circuit breakers serving HACR rated loads shall be HACR type. Circuit breakers serving other motor loads shall be motor rated.
L. Breakers indicated as "current limiting " (CL), shall be of the non-fused type; Square D I-Limiter, Westinghouse Limit-R, or ITE Sentron only.

SECTION 26 51 00

LIGHTING

PART 1 - PRODUCTS

1.01 Fixtures
A. Fixtures shall be of the types, wattage's and voltages shown on the Drawings and be UL classified and labeled for the intended use.
B. Substitutions will not be considered unless the photometric distribution curve indicates the proposed fixture is equal to or exceeds the specified luminaire.
C. Luminaire wire, and the current carrying capacity thereof shall be in accordance with the CEC.
D. Luminaires and lighting equipment shall be delivered to the project site complete, with suspension accessories, aircraft cable, stems, canopies, hickeys, castings, sockets, holders, ballasts, diffusers, frames, and related items, including support and braces.

1.02 LED Power Supplies / Drivers:
A. Power Supplies and Drivers shall be of the types shown on the drawings. Drivers shall be CBM certified and bear the UL label. Drivers shall be the high power factor type and have a 10% maximum total harmonic distortion.
B. All Drivers for fixtures installed outdoors shall provide reliable operation at 0°F at 90% of the nominal line voltage.
C. Drivers shall be Sound Rated A+ or will be rejected and shall be replaced at no expense to the Owner.

1.03 Light Sources:
A. All LED sources shall be new at the time of acceptance; been fabricated within 12 months before installation per the date code on the module; and shall be CREE, General Electric, Osram /Sylvania, Phillips, or approved equal.
B. Unless otherwise noted on the drawings, Light Engines shall have the highest available efficacy, 3500°K, and 85 CRI minimum.

PART 2 - EXECUTION

2.01 Installation:
A. General:
1. All fixtures and luminaires shall be clean and light engines shall be operable at the time of acceptance.
2. Install luminaires in accordance with manufacturer's instructions, complete with power supply/driver, light source and controls, ready for operation as indicated.
3. Align, mount, and level the luminaires uniformly.
4. Avoid interference with and provide clearance for equipment. Where an indicated position conflicts with equipment locations, change the location of the luminaire by the minimum distance necessary.
B. Mounting and Supports:
1. Mounting heights shall be as shown on the Drawings. Unless otherwise shown, mounting height shall be measured to the centerline of the outlet box for wall mounted fixtures and to the bottom of the fixture for suspended fixtures and to the bottom of the fixture for all other types.
2. Luminaire supports shall be anchored to structural members.
3. Pendant stem mounted luminaires shall be provided with ball aligners to assure a plumb installation and shall have a minimum 45 degree clean swing from horizontal in all directions. Sway bracing shall be installed as required to limit the movement of the fixture. Fixtures shall be allowed to sway a maximum of 45° without striking any object.
4. Fixture supports shall be designed to resist earthquake forces of UBC Seismic Area.

REGISTERED PROFESSIONAL ENGINEER
CURTIS J. TAYLOR
No. E23019
EXP. 12/31/21
ELECTRICAL
STATE OF CALIFORNIA
FOR PLAN CHECK ONLY

AURUM CONSULTING ENGINEERS MONTEREY BAY, INC.
Project No. 21-410.00
60 Garden Court • Suite 210 • Monterey, CA 93940
T.831.646.3330 • F.831.646.3336 • www.acemb.com

REVISIONS	DATE

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303 Potrero St., Suite 43-108
Santa Cruz, California 95060-2777
AE Project # : 20210099

ROUNDTREE FACILITY
ROOFTOP UNIT REPLACEMENT
SANTA CRUZ COUNTY
90 ROUNDTREE LANE
WATSONVILLE, CA 95073

ELECTRICAL SPECIFICATIONS

DATE 11/19/21
SCALE
DRAWN CADD
JOB 20210099
SHEET E6.1

TECHNICAL SPECIFICATIONS

EXHIBIT "B"

NOTE: Specifications are included in the project drawings.
Reference Exhibit "A"

SUPPLEMENTAL CONDITIONS

EXHIBIT "C"

County of Santa Cruz
GENERAL SERVICES DEPARTMENT
FACILITIES MAINTENANCE & PROJECT OPERATIONS
1110 EMELINE AVENUE, SANTA CRUZ, CA 95060-4073

SUPPLEMENTAL & SPECIAL CONDITIONS

PROJECT 21TI-036

The Supplemental Conditions enumerated below shall be applicable to the noted Project above and shall be enforced by County Facilities Maintenance & Project Operations with the support of County Risk Management and Counsel.

1. Contractor **MUST** ensure ALL Workers onsite are wearing Safety PP&E which will include Hardhats, orange or bright green safety vests, steel toed shows, jeans or other applicable work pants, appropriate work shirt preferably with the Contractor name written on said shirt, safety glasses, and safety gloves, and ear protection when applicable.
2. Contractor **MUST** abide by COVID 19 Compliance regulations if and when enforced. If enforced, while walking to and from the work site or outside the work site during the day said Contractor shall ensure all Crew have and wear proper face coverings. While in the work zone area Contractor can remove face coverings if Contractor policy permits.
3. Bidders **are required** to submit a **"Bid Bond"** during the Bid Phase of this project if the value of the Project equals or exceeds $10,000.
4. The successful Bidder **is required** to obtain and submit a **"Payment & Performance"** Bond for 100% of the project Bid Value. A **"Performance Bond"** is required if the value of the project exceeds $10,000. A **"Payment Bond"** is required if the value of the project exceeds $25,000. **Payment and Performance Bonds** are not required to be submitted with the Bid. These will be requested of the apparent successful Bidder during Post Bid proceedings.
5. This project will be registered with the Department of Industrial Relations (DIR) and assigned a DIR #. County General Services Department (GSD) will issue that # to the successful Bidder.
6. Contractor shall start work at 7:00 am and cleanup the work site daily beginning at 2:30 pm. Contractor shall be offsite by 3:30pm unless authorized to work overtime.
7. Materials and equipment shall be staged accordingly.
8. Contractor shall define the required staging and laydown area(s) required for the duration of the project. Area shall be adequately delineated, and proper signage installed if applicable.
9. The successful contractor **SHALL** collaborate with **ALL** applicable County Departments and Representatives to include Facilities Maintenance & Project Operations.
10. Contractor shall maintain a safe site and comply with OSHA Regulations.
11. Contractor is obligated to comply with applicable building codes.
12. Contractor is responsible for the project schedule which includes a baseline, monthly progress, and look ahead schedules throughout the project duration.
13. Change Conditions shall be discussed in advance of Contractor submitting any **"Proposed Change Order"** to Facilities Maintenance & Project Operations. ALL **"Proposed Change Orders"** MUST be submitted with applicable supporting documentation.

14. Contractor shall, at appropriate project intervals, schedule Facilities Maintenance & Project Operations to conduct a trades specific building inspection ensuring means & methods performance meets code requirements. These observations are equivalent to a typical inspection activity from the Agency Having Jurisdiction for enforcement of applicable codes.
15. Facilities Maintenance & Project Operations will inspect the quality and progress of the Contractors work at irregular intervals.
16. Contractor shall use the County **"Progress Payment Schedule of Values"** when submitting for payment.
17. Contractor shall process ALL Progress Payment Applications for payment to GSDFacilities@santacruzcounty.us
18. Contractor is required to submit Certified Payroll with all submitted invoices and/or payment applications.
19. Contractor will carry a current and in good standing State of California Contractors License for the work performed.
20. Contractor shall submit applicable certificates of insurance (COI).
21. Contractor will review and execute an Independent Contracting Agreement (ICA) when issued by County General Services Department (GSD) or be issued a Purchase Order (PO). Both bind the Contractor and County to the documents and terms and conditions of the project.
22. Project warranty on material and labor shall be extended to the County by the Contractor during closeout of the project. Warranty on labor and materials shall be separately defined.
23. Taxes (if applicable) shall be included in the Contractor Bid.
24. Facilities Maintenance & Project Operations shall provide to the Contractor a "Notice of Substantial Completion" at a time when the majority of the contracted work is completed and a "Punch List" of the work is scheduled.
25. Contractor before receiving "Retention" payment MUST have completed work to include "Punch Items" and have received a "Notice of Completion".

SPECIAL CONDITIONS:

A. The County has procured the AHU equipment from Siegler's and Carrier. Purchased Units are due to arrive May 29, 2022. Contractor will be held accountable for all coordination of the receipt, confirmation of secure delivery, and observation of the equipment physical not operational condition.
B. Contractors assigned Crew shall individually complete the Sheriff's Office "Access Application". Clearance for the Team is required before start of construction activities.

EXISTING CONDITION PHOTOGRAPHS

EXHIBIT “D”

SCOPING OF WORK

EXHIBIT “E”

County Of Santa Cruz
GENERAL SERVICES DEPARTMENT

FACILITIES MAINTENANCE & PROJECT OPERATIONS
1110 EMELINE AVE, SANTA CRUZ, CA 95060
(831) 454-5251 OR (831)454-5255

SANTA CRUZ COUNTY FACILITIES MAINTENANCE & PROJECT OPERATIONS

VOLUME #1 SCOPING DOCUMENT

PROJECT 21TI-036

ROOFTOP AHU'S REMOVAL & REPLACEMENT

March 30, 2022

**PURCHASING * ENERGY MANAGEMENT *CONSTRUCTION PROJECT MANAGEMENT *FACILITIES MAINTENANCE * FLEET SERVICES *EMERGENCY SERVICES *WAREHOUSE SERVICES *CUSTODIAL SERVICES *COUNTY FIRE SERVICES *COUNTY SAFETY*

FACILITIES MAINTENANCE & PROJECTS OPERATIONS

PURPOSE:

This project is being funded due to urgent situation at the Rountree Correctional Facility and the inability with certainty to sustain space conditioning Population POD's "R" and "S". POD "S" unit has failed. Population has been relocated to other facilities. POD "R" remains populated, but the mechanical unit is on life support. The project wnet through an expedited but thorough engineering design. These two AHU's must be replaced and the controls upgraded. Continued deference puts the Sheriff's Office in violation of many corrections' facility health and safety codes.

The County of Santa Cruz has developed this project Bid Package specifically in an effort to solicit qualified Contractors to review the supporting documents, participate in the Pre-Bid Job Walks, submit when applicable Pre-Bid RFI's, and compile a "Fair Market" competitive and complete Bid.

The Contractor will execute the work professionally and with an industry expected level of acceptable quality. The County of Santa Cruz submits this scoping document as a supporting document in Project # P22-056 Bid Package.

SCOPE OF WORK SUMMARY:

Bidders shall be informed that the mechanical units have been procured by the County General Services Department. The schedule in Volume II notes the expected equipment delivery date. The Bidder will be under obligation to receive OFCI equipment. The Bidder will be responsible to conduct a condition survey of the equipment ensuring it was not damaged during shipment and storage. Any recognized damage must be brought to the County Representatives attention.

The primary scope of work is the removal of existing AHU's and disconnecting of existing supply and return air ducts at the equipment on both POD's R&S Units. Inspection of existing curbing is essential for fit and function of the new equipment. Curbing likely will need to be replaced. Newly installed curbing shall be batched back on the roof for proper sealing and waterproofing.

Inmate evacuation of both PODs concurrently is not possible. Work shall be executed one POD at a time with minimal lap over between PODs construction. New Delta Controls will be connected to new equipment's BACnet system. New Units shall be commissioned in Closeout of the project. Closeout shall include Air Balancing of both PODs with adjoining spaces. O&M manuals shall be provided to the County upon completion of commissioning.

CLARIFICATION:

- Bidder shall reference **Exhibit "C"** of Volume II in the Bid Package for "Supplemental and Special Conditions" associated with this project.
- Bidder crew shall not wander off or outside of the delineated Work Zone.
- All exit doors are to remain closed during construction for security reasons.
- Contractor shall start work at 7:00am. Work site shall be cleaned prior to leaving the site daily.
- Contractor will be off site by 4:30pm daily unless prior arrangements are made with Facilities Maintenance & Project Operations.
- Contractor shall submit appropriate project specific Submittals for formal review by County Facilities Maintenance & Project Operations for compliance with unpublished standards.
- At the conclusion of each workday Contractor shall clean up the project site to ensure the site is safe, secured, clean and orderly.

SCHEDULE:

Facilities Maintenance & Project Operations have derived **"Preliminary Project Schedule"** for the Bid Phase. (Reference **Exhibit F**) The estimated duration is 90 calendar days.

Prior to start of work the Contractor shall meet with Facilities Maintenance & Project Operations to discuss the "Baseline" schedule and the inferred approach to the executing the work.

SAMPLE

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS, THAT WHEREAS the County of Santa Cruz, State of California, hereinafter designated as the "Obligee," has on _____, 200__, awarded to _____ hereinafter designated as "Principal," a contract for the construction of _____ _____(Contract No.) _____, and

WHEREAS, said Principal is required to furnish a bond in connection and with said contract, providing that if said Principal, or any of his or its subcontractors, shall fail to pay for any materials, provisions, or other supplies used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor done thereon of any kind, the Surety on this bond will pay the same to the extent hereinafter set forth:

NOW, THEREFORE, We, the Principal, and _____ _____as Surety, are held and firmly bound unto the Obligee in the penal sum of _____ _____ lawful money of the United States for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal, or any of his or its subcontractors, shall fail to pay any of the persons named in Section 3181 of the Civil Code of the State of California, or any amounts due under the Unemployment Insurance Code with respect to such work or labor performed under the contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department of the State of California, from the wages of employees of the Principal and subcontractors pursuant to Section 13020 of the Unemployment Insurance Code of the State of California with respect to such work or labor, as required by the provisions of Section 3225 and following of the Civil Code of the State of California, then said Surety will pay the same in, or to an amount not exceeding the amount, hereinabove set forth, and also will pay, in case suit is brought upon this bond, reasonable attorneys' fees to such claimant and to the Obligee as shall be fixed by the Court.

This bond is issued pursuant to Civil Code § 9550 et seq., inclusive, of the State of California, and shall inure to the benefit of any and all persons, companies, and corporations named in Section 3181 of said Civil Code so as to give a right of action to them or their assigns in any suit brought upon this bond.

The said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or to the work to be performed thereunder, or the specifications accompanying the same shall, in any way, affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract, or to the work or to the specifications. Said Surety hereby waives the provisions of Sections 2819 and 2845 of the Civil Code of the State of California.

SAMPLE

PAYMENT BOND CONTINUED

IN WITNESS WHEREOF, the above-bounden parties have signed this instrument under their seals this _____ day of _____, 200__, the name and corporate seal of each corporate party being hereto affixed, and these presents duly signed by its undersigned representatives, pursuant to authority of its governing body.

(SEAL)

_____
Principal

_____
Signature for Principal

_____
Title of Signatory

(SEAL)

_____
Surety

_____
Signature of Surety

_____
Title of Signatory

(This bond must be submitted in sets of four, each bearing original signatures. The signature of the Attorney-In-Fact for the Surety must be acknowledged by a Notary Public. These bonds must be accompanied by a current Power of Attorney appointing such Attorney-In-Fact.)

SAMPLE

Bond Number:
Premium:

FAITHFUL PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS, that WHEREAS the County of Santa Cruz, State of California, hereinafter designated as the "Obligee," has on _____,200__, awarded to _____ hereinafter designated as the "Principal," a contract for the construction of _____ _____(Contract No. _____), and

WHEREAS said Principal is required, under the terms of the Contract, to furnish a bond for the faithful performance of said Contract:

NOW, THEREFORE, We, the Principal, and _____ as Surety, are held and firmly bound unto the Obligee in the penal sum of _____ _____ Dollars ($_____) lawful money of the United States for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that, if the above bounden Principal, his or its heirs, executors, administrators, successors, or assigns shall in all things stand to and abide by, and well and truly keep and faithfully perform the covenants, conditions, and agreement in the said Contract, and any alterations made as therein provided, on his or their part to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the Obligee, its officers and agents as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and virtue, and Principal and Surety, in the event suit is brought on this bond, will pay to the Obligee such reasonable attorneys' fees as may be fixed by the Court.

As a condition precedent to the satisfactory completion of the said Contract, the above obligation in said amount shall hold good for a period of one (1) year after the completion and acceptance of the said work, during which time if the above bounden Principal, his or its heirs, executors, administrators, successors, or assigns shall fail to make full, complete, and satisfactory repair and replacements or totally protect the said Obligee from loss or damage made evident during said period of one (1) year from the date of acceptance of the work, and resulting from or caused by defective materials or faulty workmanship in the prosecution of the work done, the above obligation in the said sum shall remain in full force and effect. However, anything in this paragraph to the contrary notwithstanding, the obligation of the Surety hereunder shall continue so long as any obligation of the Principal remains.

The said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or to the work to be performed thereunder, or the specifications accompanying the same, shall, in any way, affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract, or to the work or to the specifications. Said Surety hereby waives the provisions of Section 2819 and 2845 of the Civil Code of the State of California.

FAITHFUL PERFORMANCE BOND CONTINUED

SAMPLE

IN WITNESS WHEREOF, the above bounden parties have signed this instrument under their seals this _____ day of_____, 20___, the name and corporate seal of each corporate party being hereto affixed, and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

(SEAL)

_____
Principal

_____
Signature for Principal

_____
Title of Signatory

(SEAL)

_____
Surety

_____
Signature of Surety

_____
Title of Signatory

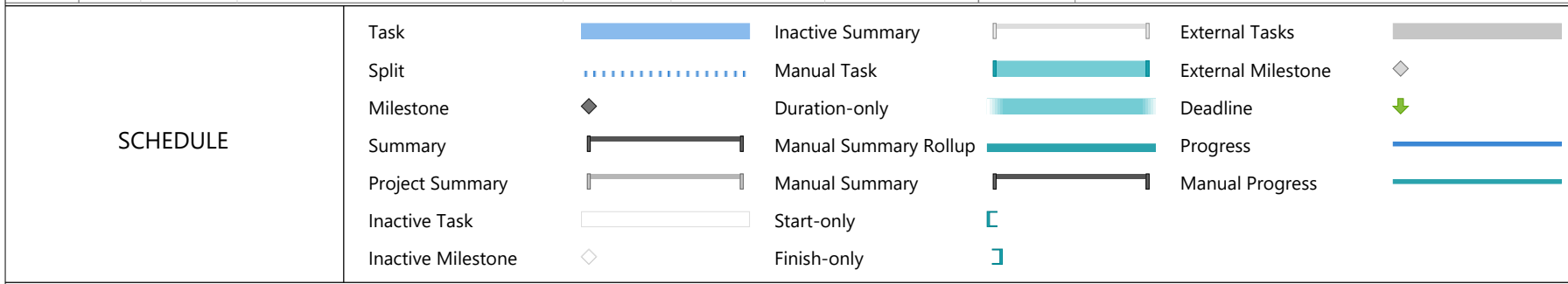
(The signature of the Attorney-In-Fact for the Surety must be acknowledged by a Notary Public, and this bond must be accompanied by a current Power of Attorney appointing such Attorney-In-Fact. This bond must be submitted in sets of four, each bearing original signatures.)

PRELIMINARY PROJECT SCHEDULE

EXHIBIT "F"

ROUNTREE MECHANICAL AIR HANDLING UNITS REPLACEMENT

ID	Task Mode	Task Name	Duration	Start	Finish
1					
2		**ROUNTREE AHU's REPLACEME**	**213 days**	**Mon 11/8/21**	**Wed 8/31/22**
3		**Equipment (Owner Furnish**	**66 days**	**Mon 11/8/21**	**Tue 2/8/22**
4		Negotiate Purchase	58 days	Mon 11/8/21	Wed 1/26/22
5		Confirm Release to Manufacturing	0 days	Tue 2/8/22	Tue 2/8/22
6		**PROCUREMENT**	**77 days**	**Tue 2/15/22**	**Thu 6/2/22**
7		BOS Project Approval	0 days	Tue 2/15/22	Tue 2/15/22
8		Draft CUPCCAA Informal Bid Package	10 days	Mon 2/21/22	Fri 3/4/22
9		Release Bid Package to Exchange	1 day	Wed 3/30/22	Wed 3/30/22
10		Mandatory Job Walk	1 day	Wed 4/6/22	Wed 4/6/22
11		Pre-Bid RFI	5 days	Thu 4/7/22	Wed 4/13/22
12		Addenda	3 days	Fri 4/15/22	Tue 4/19/22
13		Bid Submission	0 days	Mon 4/25/22	Mon 4/25/22
14		Notice of Award	0 days	Wed 4/27/22	Wed 4/27/22
15		Required Document Submission	10 days	Thu 4/28/22	Wed 5/11/22
16		Board Draft & Submit	3 days	Thu 5/19/22	Mon 5/23/22
17		BOS Approval	0 days	Tue 5/31/22	Tue 5/31/22
18		Notice to Proceed	0 days	Thu 6/2/22	Thu 6/2/22
19		**CONSTRUCTION**	**58 days**	**Mon 6/13/22**	**Wed 8/31/22**

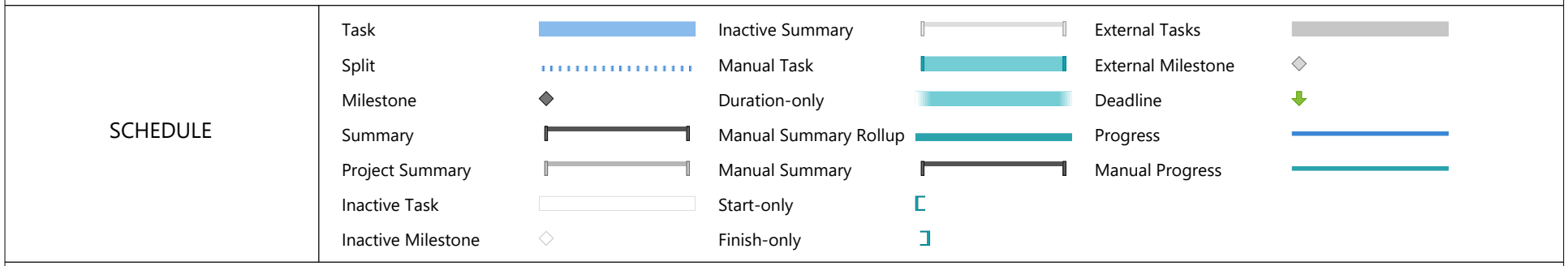


SCHEDULE

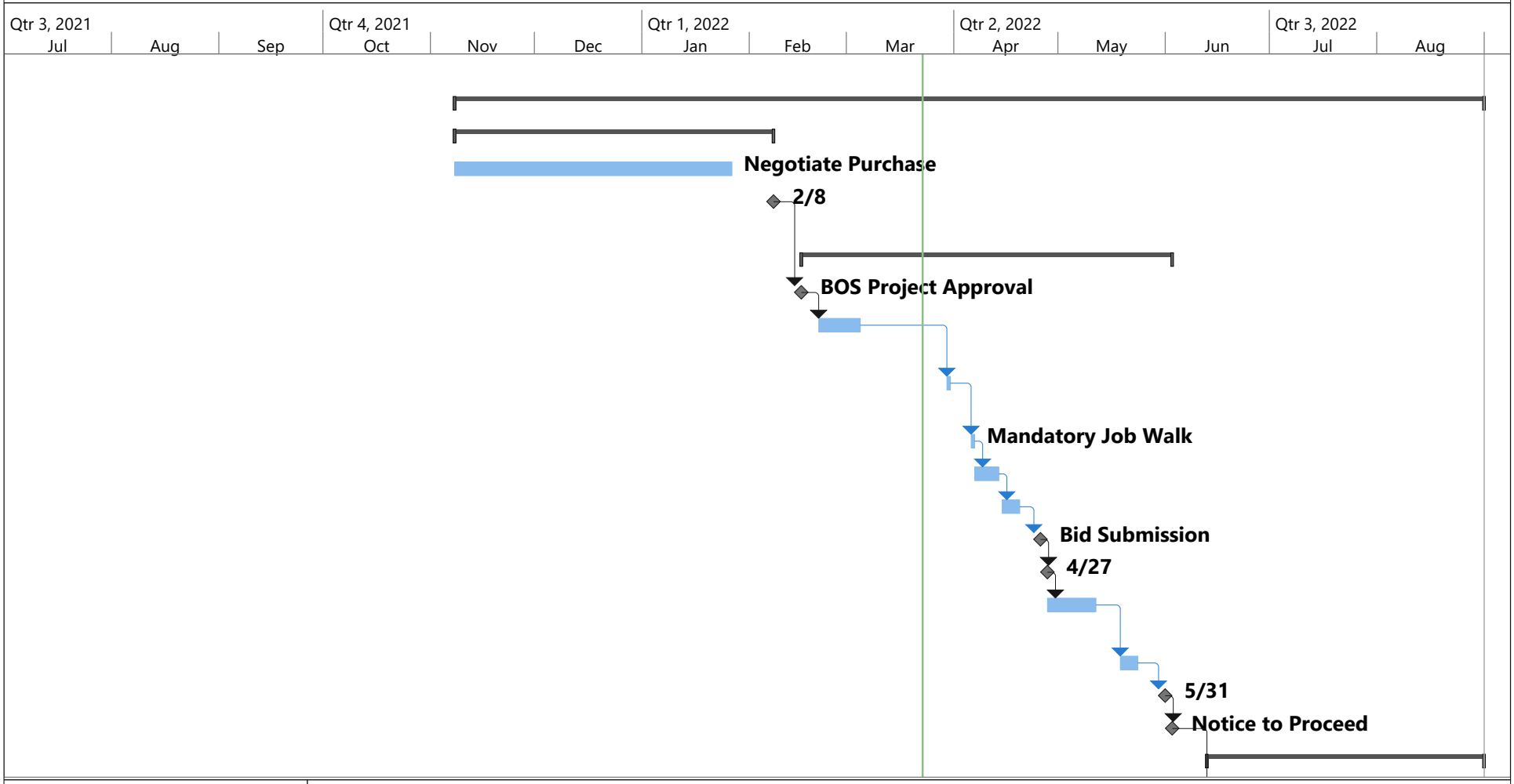
Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	

ROUNTREE MECHANICAL AIR HANDLING UNITS REPLACEMENT

ID	Task Mode	Task Name	Duration	Start	Finish
20		Mobilization	2 days	Mon 6/13/22	Tue 6/14/22
21		Mechanical Equipment Delivery	0 days	Thu 6/16/22	Thu 6/16/22
22		Execution	45 days	Thu 6/16/22	Wed 8/17/22
23		Substantial Completion	1 day	Thu 8/18/22	Thu 8/18/22
24		Commissioning Equipmer	3 days	Tue 8/23/22	Thu 8/25/22
25		Completion	2 days	Wed 8/24/22	Thu 8/25/22
26		Notice of Completion	2 days	Fri 8/26/22	Mon 8/29/22
27		Warranty Start	0 days	Wed 8/31/22	Wed 8/31/22



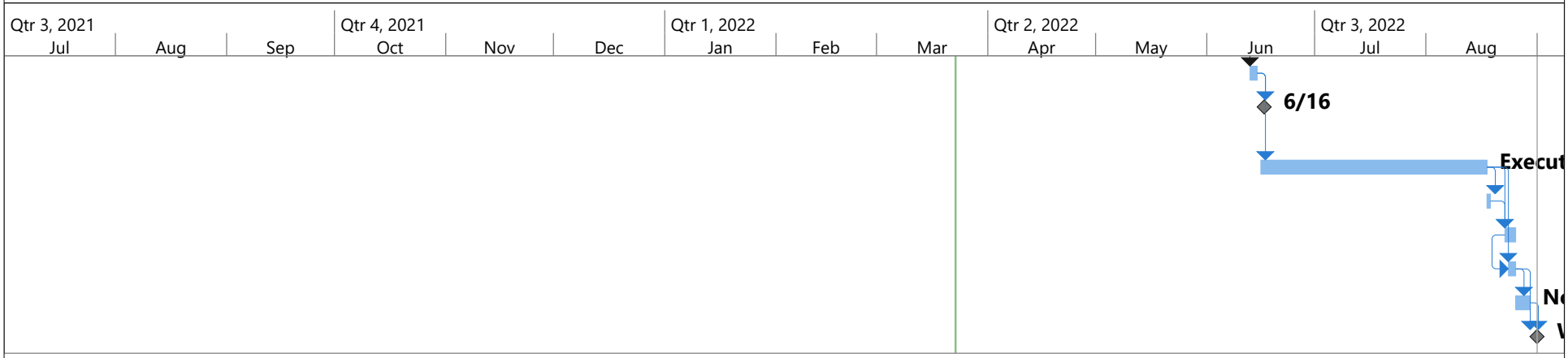
ROUNTREE MECHANICAL AIR HANDLING UNITS REPLACEMENT



SCHEDULE

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	

ROUNTREE MECHANICAL AIR HANDLING UNITS REPLACEMENT



SCHEDULE

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			

PROGRESS PAYMENT APPLICATION

EXHIBIT "G"

COUNTY OF SANTA CRUZ
DEPARTMENT OF GENERAL SERVICES

PROGRESS PAYMENT SCHEDULE

BID NUMBER: **21TI-021**

CONTRACTOR:

PROJECT NAME: DA Tenant Improvement

PROGRESS PAYMENT NO.			1
PERIOD:	07/01/21	**THROUGH**	07/31/21
INDEX:	333100	**SUBOBJ**	61835
CONTRACT NO.	21C14499	**USERCODE**	G10270

CONTRACT AMOUNT	**$**	87,820.84
CONTINGENCY	**$**	8,782.08
TOTAL CONTRACT VALUE	**$**	96,602.92

Item #	ITEM DESCRIPTION	BID SCHEDULE AMOUNT	THIS PERIOD % COMPLETE	THIS PERIOD AMOUNT	TOTAL TO DATE % COMPLETE	TOTAL TO DATE AMOUNT
	GENERAL CONDITIONS					
1	Bid Bond	$100.00	100%	100.00	100%	100.00
2	Mobilization / Setup	$4,300.68	100%	4,300.68	100%	4,300.68
	PHASE IV					
1	Carpet Tile Installation	$7,837.39	0%	0.00	0%	-
2	Floor Preparation	$1,105.00	0%	0.00	0%	-
4	Base Installation	$1,115.65	0%	0.00	0%	-
5	Storage Materials Carpet / Base	$10,797.00	100%	10,797.00	100%	10,797.00
	PHASE V					
1	Carpet Tile Installation	$7,837.39	0%	0.00	0%	-
2	Floor Preparation	$1,105.00	0%	0.00	0%	-
4	Base Installation	$1,115.65	0%	0.00	0%	-
5	Storage Materials Carpet / Base	$10,797.00	100%	10,797.00	100%	10,797.00
	PHASE VI					
1	Carpet Tile Installation	$7,837.39	0%	0.00	0%	-
2	Floor Preparation	$1,105.00	0%	0.00	0%	-
4	Base Installation	$1,115.65	0%	0.00	0%	-
5	Storage Materials	$10,797.00	100%	10,797.00	100%	10,797.00
	PHASE VII					
1	Carpet Tile Installation	$7,837.39	0%	0.00	0%	-
2	Floor Preparation	$1,105.00	0%	0.00	0%	-
4	Base Installation	$1,115.65	0%	0.00	0%	-
5	Storage Materials	$10,797.00	100%	10,797.00	100%	10,797.00

SUBTOTAL		$87,820.84		$47,588.68		$47,588.68
	CHANGE CONDITIONS			-		-
1	CCO #01 PCO #01 Bonds P&P	$2,634.60	0%	0.00	0%	-
2	CCO #02 PCO #02 Matl Reconciliation	$3,421.06	0%	0.00	0%	-
3	CCO #03 PCO #03 Stock Material	$2,400.75	0%	0.00	0%	-
4				-		-
SUBTOTAL		$8,456.41		$0.00		$0.00
				-		-
	TOTAL	$96,277.25		$47,588.68		$47,588.68

I CERTIFY THAT ALL WORK FOR WHICH PAYMENT IS TO BE MADE ON THIS CONTRACT HAS BEEN DONE IN ACCORDANCE WITH THE CONTRACT PLANS, SPECIFICATIONS AND AGREEMENTS.

CONTRACTOR _____ DATE _____

PROJECT MANAGER _____ DATE _____

DEPARTMENT / OWNER _____ DATE _____

SUMMARY

TOTAL AMOUNT TO DATE		$47,588.68
LESS RETENTION	5% -	2,379.43
NET AMOUNT		45,209.25
LESS AMOUNT PREVIOUSLY PAID		-
TOTAL AMOUNT PAYABLE		45,209.25

OTHER DOCUMENTS

EXHIBIT "H"

CONSULTANTS

CIVIL ENGINEER
DeWITT & ASSOCIATES
1607 Ocean Street - Suite 1
Santa Cruz, CA 95060

LANDSCAPE ARCHITECT
HARDESTY ASSOCIATES
720 University
Palo Alto, CA 94301

STRUCTURAL ENGINEER
CYGNA CONSULTING ENGINEERS
160 Spear Street Suite 1200
San Francisco, CA 94105

PLUMBING/FIRE PROTECTION/ MECHANICAL ENGINEER
GEORGE GREENE COMPANY
221 E. Hacienda Avenue
Campbell, CA 95008

ELECTRICAL ENGINEER
JACK D. TODD, INC.
245 Stockton Avenue
San Jose, CA 95126

FOOD SERVICE CONSULTANT
THE MARSHALL ASSOCIATES
675 Mariners Island Blvd., Ste 109
San Mateo, CA 94404

SECURITY CONSULTANT
ROBERT S. GEORGE, AIA
325 South B Street
San Mateo, CA 94401

DATA

CONSTRUCTION TYPE: TYPE II, FIRE RESISTIVE
OCCUPANCY TYPE: GROUP I, DIVISION 3; GROUP B2
ALLOWABLE AREA: (SEE CALCULATIONS BELOW)
ACTUAL TOTAE AREA (S.F.)

ACTUAL TOTAL AREA (S.F.)			AREA RATIOS (UBC SEC 503a) ACTUAL S.F. / ALLOWABLE S.F.				
			I3		B2		
GROUND LEVEL:	I3	15,557					
	B2	6,623					
		22,180					
SECOND LEVEL:	I3.	3,713					
TOTAL		25,893	19,270 / 30,200	+	6,623 / 79,800	=	0.72

ALL AREAS FULLY SPRINKLERED
APPLICABLE CODES:
1. CALIFORNIA ADMINISTRATIVE CODE
   A. TITLE 15
   B. TITLE 19
   C. TITLE 24
2. UNIFORM BUILDING CODE - 1988 EDITION

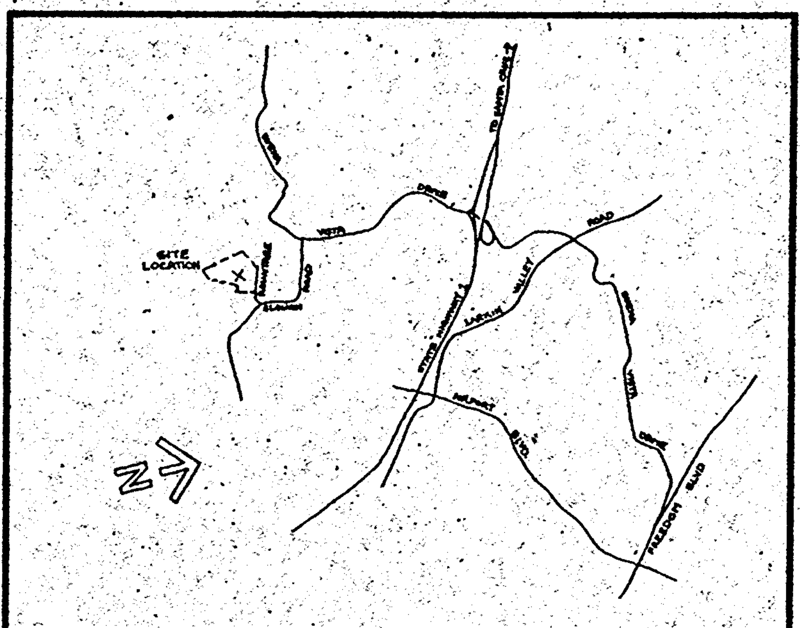
ALLOWABLE AREAS CALCUATIONS:

	I3	B2
BASIC ALLOWABLE AREA (S.F.) (UBC TABLE 5-C)	15,100	39,900
INCREASE FOR FIRE EXTINGUISING SYSTEM (UBC SEC. 506C)	X 2	X 2
TOTAL ALLOWED (S.F.)	30,200	79,800

MATERIAL & WALL INDICATIONS

MATERIAL	WALL
SOIL	STUD WALL
AGGREGATE BASE	WINDOW WALL
SAND/MORTAR/PLASTER	CONCRETE (LARGE SCALE)
CONCRETE	CONCRETE (SMALL SCALE)
CONCRETE MASONRY UNIT	CONCRETE MASONRY UNIT (CMU)
BRICK	BRICK
STONE	BRICK & CMU
METAL	SOUND WALL
METAL LATH	FIRE RATED WALL
WOOD, FINISH	THERMAL WALL
WOOD FRAMING	DEMOUNTABLE PARTITION
WOOD FRAMING (BLOCKING)	DIAGONAL BRACE IN WALL
PLYWOOD	STUD WALL WITH METAL PANELS
GLASS	CHAIN LINK FENCE
ACOUSTICAL TILE OR BOARD	
GYPSUM BOARD	
INSULATION, BATT	
INSULATION, RIGID	
CERAMIC TILE	
ASPHALTIC CONCRETE	

LOCATION MAP



ABBREVIATIONS

A.B.	ANCHOR BOLT
A.C.	ASPHALTIC CONCRETE
A/C	AIR CONDITIONING
AC. TILE	ACOUSTICAL TILE
ADJ.	ADJUSTABLE
A.F.S.	AUTOMATIC FIRE SPRINKLER
ALUM.	ALUMINUM
&	AND
∠	ANGLE
ANOD.	ANODIZED
ASPH.	ASPHALT
A.T.	ASH TRAY
@	AT
B/	BACK OF OR BOTTOM OF
BD.	BOARD
BLDG.	BUILDING
BLKG.	BLOCKING
BM.	BEAM
B.O.J.	BOTTOM OF JOISTS
BOTT.	BOTTOM
B.U.	BUILT-UP
CABT.	CABINET
CAD. PL.	CADMIUM PLATED
C.B.	CATCH BASKET OR CHALKBOARD
C.D.	CUP DISPENSER
CEM.	CEMENT
CER.	CERAMIC
[	CHANNEL
C.I.	CAST IRON
C.J.	CONSTRUCTION JOINT
℄	CENTER LINE
CLR.	CLEAR
CLG.	CEILING
C.M.U.	CONCRETE MASONRY UNIT
C.O.	CLEANOUT
COL.	COLUMN
COMP.	COMPOSITION
CONC.	CONCRETE
CONN.	CONNECTION
CONT.	CONTINUOUS
CONTR.	CONTRACTOR
C.O.T.G.	CLEAN OUT TO GRADE
CSK.	COUNTERSUNK
C.W.	COLD WATER
Ø	DIAMETER
DET.	DETAIL
D.F.	DOUGLAS FIR
D.F.	DRINKING FOUNTAIN
DIM.	DIMENSION
D.S.	DOWNSPOUT
DWG.	DRAWING
EA.	EACH
E.J.	EXPANSION JOINT
ELEC.	ELECTRICAL
ELEV.	ELEVATION
ENCL.	ENCLOSURE
E.P.B.	ELECTRIC PANEL BOARD
EQ.	EQUAL
E.S.	EXPANSION SHIELD
E.W.C.	ELECTRIC WATER COOLER
E.W.H.	ELECTRIC WATER HEATER
EXH.	EXHAUST
EXIST. or (E)	EXISTING
EXT.	EXTERIOR
F.B.	FLAT BAR
FBRGL.	FIBERGLASS
F.D.	FLOOR DRAIN
FDN.	FOUNDATION
F.E.	FIRE EXTINGUISHER
F.E.C.	FIRE EXTINGUISHER CABINET
F.H.	FIRE HYDRANT OR FLAT HEAD
F.H.C.	FIRE HOSE CABINET
FIN.	FINISH
FL.	FLOOR
F.O.	FINISHED OPENING
F.O.C.	FACE OF CONCRETE
F.O.F.	FACE OF FINISH
F.O.M.	FACE OF MASONRY
F.O.S.	FACE OF STUD
F.S.	FLOOR SINK
FTG.	FOOTING
FRP	FIBERGLASS REINFORCED PLASTIC
GA.	GAUGE
GALV.	GALVANIZE(D)
G.I.	GALVANIZED IRON
GRD.	GROUND OR GRADE
G.S.F.	GROSS SQUARE FEET
G.V.	GATE VALVE
G.V.C.B.	GATE VALVE IN CONCRETE BOX
GYP.	GYPSUM
HDR.	HEADER
HDWD.	HARDWOOD
HDWR.	HARDWARE
H.M.	HOLLOW METAL
HORIZ.	HORIZONTAL
H.P.	HIGH POINT
HR.	HOUR
H.R.C.	HOSE REEL CABINET
H.S.B.	HIGH STRENGTH BOLT
HT.	HEIGHT
H.T.D.	HANDICAP TOWEL DISPENSER
HTG.	HEATING
H.W.	HOT WATER
H.W.D.	HOT WATER DISPENSER
I.D.	INSIDE DIAMETER
INV.	INVERT
INSUL.	INSULATION
INT.	INTERIOR
J.B.	JUNCTION BOX
K.O.	KNOCKOUT
K.P.	KICKPLATE
LAVS.	LAVATORIES
L.P.	LOW POINT
L.S.D.	LIQUID SOAP DISPENSER

MAT.	MATERIAL
MAX.	MAXIMUM
M.B.	MACHINE BOLT
MECH.	MECHANICAL
MET.	METAL
MFR.	MANUFACTURER
M.H.	MANHOLE
MIN.	MINIMUM
M.S.	MACHINE SCREW
MULL.	MULLION
N.I.C.	NOT IN CONTRACT
N.S.F.	NET SQUARE FEET
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.H.	OVAL HEAD
OPNG.	OPENING
OPP.	OPPOSITE
O.D.	OVERFLOW DRAIN or OUTSIDE DIAMETER
P.A.	PUBLIC ADDRESS
P.B.	PANIC BAR
P.D.F.	POWDER DRIVEN FASTENER
P.H.	PHILLIPS HEAD
ℙ	PLATE
P/L	PROPERTY LINE
PLAS.	PLASTER
PLAS. LAM.	PLASTIC LAMINATE
PLY.	PLYWOOD
PNL.	PANEL
POL.	POLISHED
PORC. ENAM.	PORCELAIN ENAMEL
P.S.D.	POWDER SOAP DISPENSER
PT	POINT
P.T.D.	PAPER TOWEL DISPENSER
P.V.C.	POLY VINYL CHLORIDE
R.	RISERS
R.A.	RETURN AIR
RAD.	RADIUS
R.C.P.	REINFORCED CONCRETE PIPE
RD.	ROUND
R.D.	ROOF DRAIN
REC.	RECESSED
REINF.	REINFORCED/ING
RES.	RESILIENT
R.H.	ROUND HEAD
RM.	ROOM
RO.	ROUGH
R.O.	ROUGH OPENING
R/W	RIGHT OF WAY
RWD.	REDWOOD
R.W.L.	RAIN WATER LEADER
S.C.D.	SEAT COVER DISPENSER
S.D.	STORM DRAIN
SECT.	SECTION
S.F.	SQUARE FOOT/FEET
SHT.	SHEET
SHTHG.	SHEATHING
SHVS.	SHELVES
SIM.	SIMILAR
SK.	SINK OR SKETCH
S.M.	SHEET METAL
S.M.S.	SHEET METAL SCREW
S.N.D.	SANITARY NAPKIN DISPOSER
S.N.V.	SANITARY NAPKIN VENDOR
S.O.V.	SHUT OFF VALVE
SPECS.	SPECIFICATIONS
SQ.	SQUARE
S.S.	SERVICE SINK
STD.	STANDARD
STL.	STEEL
STOR.	STORAGE
STRUCT.	STRUCTURAL
ST. STL.	STAINLESS STEEL
SUSP.	SUSPENDED
T.D.	TOWEL DISPENSER
T.D.D.	TOWEL DISPENSER & DISPOSAL
TEL.	TELEPHONE
T & G	TONGUE AND GROOVED
T.O.	TOP OF
T.O.S.	TOP OF SLAB
T.P.	TOILET PAPER
TR.	TREAD
TYP.	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
UR.	URINAL
V.C.P.	VITREOUS CLAY PIPE
VERT.	VERTICAL
V.G.D.F.	VERTICAL GRAIN DOUGLAS FIR
W/	WITH
WAINS.	WAINSCOT
WD.	WOOD
W.P.	WORK POINT or WATERPROOF
W.R.	WATER RESISTANT or WASTE RECEPTACLE
W.S.	WEATHER STRIPPING or WOOD SCREW
W.W.	WINDOW WALL
W.W.F.	WELDED WIRE FABRIC

SYMBOLS

Symbol	Description	Name
(A) (12)	GRID LINE NUMBER OR LETTER	GRID LINE
4 / 8.4	DETAIL NUMBER / SHEET WHERE DETAIL IS DRAWN. SAME DICIPLINE U.O.N.	DETAIL
1 / 4.2	SECTION NUMBER / SHEET WHERE SECTION IS DRAWN. SAME DICIPLINE U.O.N.	BUILDING SECTION
4 / 4.4	WALL SECTION NUMBER / SHEET WHERE SECTION IS DRAWN. SAME DICIPLINE U.O.N.	WALL SECTION
4 / 5.1	EXTERIOR ELEVATION NUMBER / SHEET WHERE ELEVATION IS DRAWN. SAME DICIPLINE U.O.N.	EXTERIOR ELEVATION
A	INTERIOR ELEVATION LETTER / REFER TO ROOM FINISH MAT. & COLOR SCHEDULE FOR SHEET WHERE SHOWN.	INTERIOR ELEVATION
A 1012	DOOR MARK SEE DOOR SCHEDULE SHEET A3.2 A = INDICATES ACTIVE LEAF	DOOR
1012	ROOM NUMBER SEE ROOM INDEX ON SAME SHEET.	ROOM
E-2	WINDOW TYPE / SEE SCHEDULE SHEET A3.4	EXTERIOR WINDOW
I-3	WINDOW TYPE / SEE SCHEDULE SHEET A3.4	INTERIOR WINDOW
E-5	WINDOW TYPE / SEE SCHEDULE SHEET A3.4	EXTERIOR DETENTION WINDOW
I-4	WINDOW TYPE / SEE SCHEDULE SHEET A3.4	INTERIOR DETENTION WINDOW
A	SEE SCHEDULE SHEET A3.3	WALL TYPE
	ELEVATION ABOVE / DATUM POINT	DATUM POINT
100.00	GRADE ELEVATION / IN PLAN	GRADE POINT
TRUE NORTH	LARGE ARROW INDICATES / PLAN NORTH	NORTH ARROW
△	DELTA / SEE DISCRIPTION BLOCK ON SAME SHEET FOR DATE & DISCRIPTION	DRAWING REVISION

DRAWING INDEX

0	COVER SHEET, INDEX, SYMBOLS & ABBREVATIONS

CIVIL

C1.1	PRELIMINARY GRADING, DRAINAGE AND EROSION CONTROL PLAN
C1.2	PRELIMINARY GRADING, DRAINAGE AND EROSION CONTROL PLAN

LANDSCAPING

L1.1	LANDSCAPE PLAN

ARCHITECTURE

A1.1	SITE PLAN
A2.0	GROUND LEVEL & UPPER LEVEL OVERALL FLOOR PLANS
A2.1	GROUND LEVEL FLOOR PLAN
A2.2	UPPER LEVEL FLOOR PLAN & LOW ROOF PLAN
A2.3	UPPER ROOF PLAN
A2.4	ENLARGED PLANS
A3.1	ROOM FINISH MATERIAL AND COLOR SCHEDULE
A3.3	WALL TYPE SCHEDULE
A4.1	BUILDING SECTIONS & WALL SECTIONS
A4.2	WALL SECTIONS
A4.3	WALL SECTIONS
A5.1	EXTERIOR ELEVATIONS
A7.1	INTERIOR ELEVATIONS
A9.1	GROUND LEVEL REFLECTED CEILING PLAN
A9.2	UPPER LEVEL REFLECTED CEILING PLAN

STRUCTURAL

S0.1	STRUCTURAL GENERAL NOTES
S1.1	TYPICAL DETAILS
S1.2	TYPICAL DETAILS
S1.3	TYPICAL DETAILS
S2.1	LOWER LEVEL FLOOR & FOUNDATION PLAN
S2.2	UPPER LEVEL FLOOR & LOW ROOF FRAMING PLAN
S2.3	ROOF FRAMING PLAN
S3.1	FOUNDATION DETAILS
S4.1	WALL SECTIONS
S6.1	PRECAST CONC. WALL PANEL DETAILS
S6.2	PRECAST CONC. WALL PANEL DETAILS

PLUMBING

P0	INDEX, SYMBOLS, ABBREVIATIONS
P1.1	PLUMBING SITE PLAN
P2.1	LOWER LEVEL FLOOR PLAN
P2.2	UPPER LEVEL FLOOR PLAN
P2.3	ENLARGED PARTIAL FLOOR PLANS
P2.4	ENLARGED KITCHEN AND MECHANICAL ROOM PLAN
P3.1	FIXTURE AND EQUIPMENT SCHEDULE
P6.1	DETAILS

FIRE PROTECTION

F0	NOTES, SYMBOLS AND ABBREVIATIONS
F1.1	FIRE PROTECTION SITE PLAN
F2.1	LOWER LEVEL PLAN

MECHANICAL

M0.1	SYMBOLS, ABBREVIATIONS, SCHEDULES AND INDEX
M2.1	LOWER LEVEL FLOOR PLANS
M2.2	UPPER LEVEL FLOOR PLAN
M2.3	ROOF LEVEL FLOOR PLAN
M2.4	LOWER LEVEL ENLARGED PLAN
M4.1	CONTROLS AND DIAGRAMS
M6.1	DETAILS
M6.2	DETAILS

ELECTRICAL

E0	TITLE SHEET
E1.0	SITE PLAN
E2.1L	GROUND FLOOR PLAN - LIGHTING
E2.1P	GROUND FLOOR PLAN - POWER
E2.1S	GROUND FLOOR PLAN - SYSTEMS
E2.2L	SECOND FLOOR PLAN - LIGHTING
E2.2P	SECOND FLOOR PLAN - POWER
E3.0	LIGHTING FIXTURE SCHEDULE
E5.0	SINGLE LINE DIAGRAM

FOOD SERVICE

FS1.1	FOOD SERVICE EQUIPMENT PLAN

MEDIUM SECURITY JAIL

COUNTY OF SANTA CRUZ
CO 89045
WATSONVILLE, CALIFORNIA

EHRLICH-ROMINGER
ARCHITECTURE
PLANNING
INTERIOR DESIGN
4800 EL CAMINO REAL
LOS ALTOS, CALIFORNIA 94022
(415) 949-1300 FAX: (415) 941-2209

NO.	DESCRIPTION	DATE
-	D.D. PKG.	8/6/90

PROJECT:
MEDIUM SECURITY JAIL
COUNTY OF SANTA CRUZ
WATSONVILLE, CALIFORNIA

DWG. TITLE:
COVER SHEET
INDEX, SYMBOLS, &
ABBREVIATIONS

JOB NO: 89175. DWG. NO:
DATE:
SCALE: NONE **0**

EXHAUST FAN SCHEDULE

MARK	MANUFACTURER AND MODEL NUMBER	FAN CFM	FAN SP	MOTOR SONES	MOTOR RPM	MOTOR BHP	MOTOR HP	ELECTRICAL SERVICE V/PH/HZ	ON/OFF CONTROLS BY	OPERATING WEIGHT LBS	REMARKS
EF-1	"LOREN COOK" ACE-B-120C3B	1300	3/8	11.7	1435	0.19	1/4	120/1/60		90	
EF-2	"LOREN COOK" ACE-B-120C2B	250	3/8	4.6	930	0.03	1/8	120/1/60		90	
EF-3	"LOREN COOK" ACE-B-120C2B	250	3/8	4.6	930	0.03	1/8	120/1/60		90	
EF-4	"LOREN COOK" ACE-B-120C3B	1300	3/8	11.7	1435	0.19	1/4	120/1/60		90	
EF-5	"LOREN COOK" ACE-B-180C8B	5000	3/8	26	1425	1.49	1-1/2	208/3/60		150	
EF-6	"LOREN COOK" ACE-B-180C8B	5000	3/8	26	1425	1.49	1-1/2	208/3/60		150	
EF-7	"LOREN COOK" ACE-B-100C2B	900	3/8	8	1385	0.04	1/8	120/1/60		90	
EF-8	"LOREN COOK" ACE-B-150C4B	1900	3/8	11.5	1115	0.28	1/3	120/1/60		110	
EF-9	"LOREN COOK" ACE-B-120C2B	1000	3/8	8.1	1300	0.12	1/6	120/1/60		90	
EF-10	"LOREN COOK" ACE-B-120C2B	650	3/8	5.8	1020	0.07	1/8	120/1/60		90	
EF-11	"LOREN COOK" VCR-180V7B	2000	1-1/2	17.4	1245	1.01	1	208/3/60		150	(1)
EF-12	"LOREN COOK" VCR-300V8B	5100	1-1/2	18.9	710	2.44	3	208/3/60		450	(1)
EF-13	"LOREN COOK" VCR-300V8B	5100	1-1/2	18.9	715	2.44	3	208/3/60		450	(1)
EF-14	"LOREN COOK" VCR-245V7B	2000	1/2	12.7	680	.89	1	208/3/60		350	

(1) WITH VENTED CURB

HEATING AND VENTILATION UNIT

MARK	MANUFACTURER AND MODEL NUMBER	CAPACITY INPUT MBH	CAPACITY OUTPUT MBH	CFM	EXT SP IN WG	MOTOR HP	VENT SIZE DIA.	OPERATING WEIGHT LBS	ELECTRICAL SERVICE V/PH/HZ (3)	GAS CONN	REMARKS
HV-1	"REZNOR" MODEL HCRGB-225	200	180	5000	0.7	5	-	1500	208/3/60	1/2	(1)
HV-2	"REZNOR" MODEL HCRGB-175	150	120	5000	0.7	5	-	1400	208/3/60	1/2	(1)
HV-3	"REZNOR" MODEL HCRGB-75	75	60	1300	0.7	1	-	1200	208/3/60	1/2	(1)
HV-4	"REZNOR" MODEL HCRGB-175	150	120	4300	0.7	5	-	1400	208/3/60	1/2	(1)
HV-5	"REZNOR" MODEL HCRGB-125	112	89.6	3800	0.7	5	-	1300	208/3/60	1/2	(1)
HV-6	"REZNOR" MODEL HCRGB-125	112	89.6	3800	0.7	5	-	1600	208/3/60	1/2	(1)(2)
HV-7	"REZNOR" MODEL CRGBL-1050	845	766	14000	0.7	20	-	2500	208/3/60	1-1/4	(1)

(1) UNIT WITH FILTER RACK AND 2" DISPOSABLE FILTER, STAINLESS STEEL HEAT EXCHANGER, RAIL MOUNTED, ROOF CURB, CURB DUP, STAINLESS STEEL BURNER, 2-STAGE GAS CONTROL AND WALL MOUNTED THERMOSTAT, RELAY TO INTERLOCK UNIT WITH EXHAUST FAN, MOTORIZED DAMPER ON RETURN AND OUTSIDE AIR (ECONOMIZER), REMOTE CONSOLE STARTER, ALUMINIZED STEEL DOUBLE WALL INSULATED CABINET, OA HOOD, DOWN DISCHARGE PLENUM

(2) COOLING COIL CABINET (NO COIL)

(3) FUSED DISCONNECT SWITCH BY ELECTRICAL

ROOF VENT SCHEDULE

MARK	MANUFACTURER AND MODEL NUMBER	THROAT SIZE INCHES	DUTY	CURB TYPE	BACK DRAFT DAMPER	WEIGHT LB	REMARKS
RV-1	"LOREN-COOK" TYPE TR-36	36	RELIEF	VCA-46	YES	250	
RV-2	"LOREN-COOK" TYPE TR-36	36	RELIEF	VCA-46	YES	250	
RV-3	"LOREN-COOK" TYPE VR-24X48	24X48	RELIEF	-	YES	250	
RV-4	"LOREN-COOK" TYPE VR-24X48	24X48	RELIEF	-	YES	250	
RV-5	"LOREN-COOK" TYPE TR-30	30	RELIEF	VCA-40	YES	210	

REGISTER SCHEDULE

MARK	MANUFACTURER AND MODEL NUMBER	NECK SIZE INCH	DUTY	TYPE	REMARKS
X	X	X	X	X	X

DRAWING INDEX

MECHANICAL

SHEET NO.	TITLE
M0.1	SYMBOLS, ABBREVIATIONS, SCHEDULES AND INDEX
M2.1	DORMITORY GROUND LEVEL FLOOR PLANS
M2.2	UPPER LEVEL FLOOR PLAN AND ROOF PLAN
M2.3	ENLARGED KITCHEN FLOOR PLAN
M2.4	ROOF PLAN
M4.1	CONTROLS AND DIAGRAMS
M5.1	DETAILS
M5.2	DETAILS

AIR CONDITIONING UNIT SCHEDULE

MARK	MANUFACTURER AND MODEL NUMBER "CARRIER"	SUPPLY FAN CFM	SUPPLY FAN ESP	SUPPLY FAN TSP	SUPPLY FAN BHP	SUPPLY FAN HP	DX COOLING COIL EAT DB	DX COOLING COIL EAT WB	DX COOLING COIL LAT DB	DX COOLING COIL LAT WB	DX COOLING COIL ROWS	DX COOLING COIL TOTAL HEAT MBH	DX COOLING COIL SENSIBLE HEAT MBH	CONDENSING UNIT EVAP TEMP	CONDENSING UNIT OA TEMP	CONDENSING UNIT FAN HP	COMPRESSOR RLA	COMPRESSOR LRA	GAS-FIRED HEATING SECTION MBH INPUT	GAS-FIRED HEATING SECTION MBH OUTPUT	ELECTRICAL SERVICE V/PH/HZ	OPERATING WEIGHT LBS	REMARKS
AC-1	MODEL 48MLT-030300	1100	.6	-	.7	1	78	64	55	54	3	25	24	45	100	1/10	13.5	65	40	31	208/1/60	550	-

MECHANICAL DUCT SYMBOLS

SINGLE LINE SYMBOL	DOUBLE LINE SYMBOL	DESCRIPTION
1		LONG SWEEP 90° EL-RECTANGULAR, ROUND OR OVAL DUCT
2		SHORT SWEEP 90° EL-RECTANGULAR, ROUND OR OVAL DUCT
3		45° EL-RECTANGULAR, ROUND OR OVAL DUCT
4		30° EL-RECTANGULAR, ROUND OR OVAL DUCT
5		90° EL-RECTANGULAR DUCT (NO DUCT TURN)
6		90° EL-RECTANGULAR DUCT WITH DUCT TURN- (AERO OR THIN VANED)
7		45° LATERAL-ROUND TO ROUND OR OVAL TO OVAL
8		90° TAKEOFF WITH 45° TAPER-RECTANGULAR TO RECTANGULAR (FOR BRANCH TAKEOFF LONGER THAN 50" USE 10)
9		90° TAKEOFF WITH 45° ELONGATED TEE- ROUND TO ROUND
10		90° CONICAL TEE- ROUND TO ROUND OR OVAL TO OVAL
11		SPIN-IN WITH M/D- RECTANGULAR TO ROUND OR RECTANGULAR TO OVAL
12		90° TEE- RECTANGULAR TO ROUND OR RECTANGULAR TO OVAL
13		EXTRACTOR AND BRANCH DUCT- RECTANGULAR TO RECTANGULAR (FOR BRANCH TAKEOFFS LONGER THAN 10" USE 8)
14		Y BRANCH- ROUND OR OVAL DUCT
15		90° RADIUS SPLIT- RECTANGULAR DUCT PROVIDE SPLITTER DAMPER, 50/50 PROPORTIONAL SPLIT
16		90° RECTANGULAR SPLIT- RECTANGULAR DUCT PROVIDE SPLITTER DAMPER, 50/50 PROPORTIONAL SPLIT
17		TRANSITION- RECTANGULAR TO ROUND OR RECTANGULAR TO OVAL

SINGLE LINE SYMBOL	DOUBLE LINE SYMBOL	DESCRIPTION
18		SECTION AT SUPPLY AIR OR MAKE-UP AIR DUCT UP
19		SECTION AT RETURN AIR OR COMBUSTION AIR DUCT UP
20		SECTION AT EXHUST AIR OR RELIEF AIR DUCT UP
21		SUPPLY AIR DUCT DOWN RETURN AIR DUCT DOWN EXHAUST AIR DUCT DOWN
22		ROUND DUCT UP- SUPPLY, RETURN OR EXHAUST
23		ROUND DUCT DOWN- SUPPLY, RETURN OR EXHAUST
24		CEILING DIFFUSER- ONE-, TWO-, THREE OR FOUR WAY THROW
25		CEILING RETURN AND EXHAUST REGISTERS-
26		SUPPLY DIFFUSER, RETURN AND EXHAUST REGISTERS- WITH FLEXIBLE DUCT CONNECTIONS
27		RETURN AND EXHAUST REGISTER CONNECTION- ELBOW DOWN OR ROUND TAP OUT OF RECTANGULAR DUCT, TAP SAME SIZE AS NECK
28		SUPPLY DIFFUSER AND RETURN REGISTER CONNECTION- TAP DOWN SAME SIZE AS NECK
29		DUCT RISE IN DIRECTION OF AIR FLOW
30		DUCT DROP IN DIRECTION OF AIR FLOW
31		MANUAL VOLUME DAMPER
32		AUTOMATIC VOLUME DAMPER
33	FD / FD	FIRE DAMPER WITH DAD
34		ACOUSTICALLY LINED DUCT
35		REGISTER MARK NUMBER DESIGN CFM

1. BRANCH DUCT TO SUPPLY DIFFUSERS AND RETURN/EXHAUST GRILLES TO BE SAME AS NECK SIZE UNLESS OTHERWISE INDICATED ON FLOOR PLANS.
2. PROVIDE M/D AT ALL SUPPLY, EXHAUST AND RETURN BRANCH DUCTS TO DIFFUSERS OR GRILLES EVEN IF NOT SHOWN.
3. DUCTWORK DOWNSTREAM OF TERMINAL BOX (VAV OR CAV) TO BE ACOUSTICALLY LINED RECTANGULAR DUCT. DUCT TO BE SAME SIZE AS OUTLET OF BOX UNLESS OTHERWISE INDICATED ON FLOOR PLAN. ACOUSTICALLY LINE A MINIMUM 5' FOR SYSTEMS UNDER 2,000 CFM AND 10' FOR SYSTEMS ABOVE 2,000 CFM.
4. DUCTWORK UPSTREAM OF TERMINAL BOX (VAV OR CAV) TO BE SAME SIZE AS INLET TO BOX IF FINAL RUN IS LESS THAN 15'. IF MORE THAN 15' USE NEXT LARGER DUCT SIZE, UNLESS OTHERWISE NOTED.
5. FITTING 13 CAN BE SUBSTITUTED FOR FITTING 12
6. FITTING 15 CAN BE SUBSTITUTED FOR FITTING 12
7. FLEXIBLE DUCT CONNECTED TO REGISTER SHALL CONNECT TO PLENUM BOX OR DIRECTLY TO NECK. SEE DETAIL. FLEXIBLE DUCT SAME SIZE AS NECK UNLESS OTHERWISE NOTED.
8. FITTING 2 OR 6 CAN BE USED IN LIEU OF 1 ONLY IF SPACE DOES NOT PERMIT.
9. FITTING 16 CAN BE USED IN LIEU OF 15 IF SPACE DOES NOT PERMIT.

MECHANICAL ABBREVIATIONS

AAD	ARCHITECTURAL ACCESS DOOR	HPS	HIGH PRESSURE STEAM
AAF	AT FINISHED SURFACE AUTOMATIC AIR VENT	HWSAR	HEAT RECOVERY WATER SUPPLY/RETURN
AC	AIR CONDITIONING	HW	HEATING AND VENTILATING
ADT	ACOUSTICAL DUCT TURN	HVAC	HEATING, VENTILATING AND AIR CONDITIONING
AFB	ABSOLUTE FILTER BANK	HWR	HOT WATER RETURN
AFC	ABOVE FURRED CEILING	HWS	HOT WATER SUPPLY
AFS	AIR FLOW SWITCH	HX	HEAT EXCHANGER
AH	AIR HANDLING UNIT	IB	INERTIA BASE
AL	ALUMINUM	ICW	INDUSTRIAL COLD WATER
APD	AIR PRESSURE DROP	IN.WG	INCHES WATER GAUGE
AV	AIR VALVE	KW	KILOWATT
AVD	AUTOMATIC VOLUME DAMPER	LAT	LEAVING AIR TEMPERATURE
BDD	BACKDRAFT DAMPER	LPS	LOW PRESSURE STEAM
BHP	BRAKE HORSE POWER	LRA	LOCKED ROTOR AMPS
BT	BY-PASS TIMER	MAV	MANUAL AIR VENT
BV	BALANCE VALVE	MBH	1000 BTUH
BTUH	BRITISH THERMAL UNITS PER HOUR	MFR	MANUFACTURER
		MUA	MAKE UP AIR
CA	COMBUSTION AIR	M/D	MANUAL VOLUME DAMPER WITH LOCKING DEVICE
CAD	COMBUSTION AIR DUCT		
CAV	CONSTANT AIR VOLUME	MW	WORK UNDER MECHANICAL DIVISION OF SPECIFICATIONS
CC	COOLING COIL		
CD	CONDENSATE DRAIN	NEW	NEW
CFH	CUBIC FEET PER HOUR	NC	NORMALLY CLOSED
CFM	CUBIC FEET PER MINUTE	NO	NORMALLY OPEN
CHWR	CHILLED WATER RETURN	NTS	NOT TO SCALE
CHWS	CHILLED WATER SUPPLY	OA	OUTSIDE AIR
CL	CEILING	OAD	OUTSIDE AIR DUCT
CMR	CONTROL MANUFACTURER'S REPRESENTATIVE	OAS	OR ACCEPTABLE SUBSTITUTE
		(P)	PRESENT
CR	CONDENSATE RETURN	PCWR	PROCESS COOLING WATER RETURN
CT	COOLING TOWER	PCWS	PROCESS COOLING WATER SUPPLY
CTWR	COOLING TOWER WATER RETURN	PD	PRESSURE DROP
CTWS	COOLING TOWER WATER SUPPLY	PFB	PREFILTER BANK
CV	CHECK VALVE	PHC	PREHEAT COIL
CW	COLD WATER (DOMESTIC)	PP	PERFORATED PLATE OR POLYPROPYLENE
CWR	CONDENSER WATER RETURN	PRV	PRESSURE REDUCING VALVE
CWS	CONDENSER WATER SUPPLY	PW	WORK UNDER PLUMBING DIVISION OF SPECIFICATIONS
DAD	DUCT ACCESS DOOR		
DAMD	DUCT AIR MONITOR DEVICE	PVC	POLYVINYL-CHLORIDE
DB	DRY BULB	RA	RETURN AIR
DPG	DIFFERENTIAL PRESSURE GAUGE	RAD	RETURN AIR DUCT
(E)	EXISTING	RF/EF	RETURN/EXHAUST FAN
EA	EXHAUST AIR	RHC	REHEAT COIL
EAD	EXHUST AIR DUCT	RL	REFRIGERANT LIQUID
EAT	ENTERING AIR TEMPERATURE	RLA	RUNNING LOAD AMPS
EF	EXHUST FAN	RPM	REVOLUTIONS PER MINUTE
ESP	EXTERNAL STATIC PRESSURE	RS	REFRIGERANT SUCTION
EW	WORK UNDER ELECTRICAL DIVISION OF SPECIFICATIONS	RV	ROOF VENT OR RELIEF VENT
		SA	SUPPLY AIR
EWT	ENTERING WATER TEMPERATURE	SAD	SUPPLY AIR DUCT
ET	EXPANSION TANK	SC	SCRUBBER EXHUST
°F	DEGREES FAHRENHEIT	SD	SPLITTER DAMPER WITH LOCKING DEVICE OR SUCTION DIFFUSER
(F)	FUTURE		
FC	FLEXIBLE CONNECTION	SE	SOLVENT EXHUST
FD	FIRE DAMPER OR FLOOR DRAIN	SF	SUPPLY FAN
FLA	FULL LOAD AMPS	SP	STATIC PRESSURE
FOR	FUEL OIL RETURN	SPD	STATIC PRESSURE DROP
FOS	FUEL OIL SUCTION	SRV	SAFETY RELIEF VALVE
FPF	FINS PER FOOT	SS	STAINLESS STEEL
FPI	FINS PER INCH	ST	SOUND TRAP
FPM	FEET PER MINUTE	TCP	TEMPERATURE CONTROL PANEL
FRP	FIBERGLASS REINFORCED POLYESTER	TCV	TEMPERATURE CONTROL VALVE
		TP	TOTAL PRESSURE (VP + SP)
FT.WG	FEET WATER GAUGE	TSP	TOTAL STATIC PRESSURE
GS	U.S. GAUGE	TYP	TYPICAL
GLV	GLOBE VALVE	VAV	VARIABLE AIR VOLUME
GPM	GALLONS PER MINUTE	VLF	VERTICAL LAMINAR FLOW
GSM	GALVANIZED SHEET METAL	VI	VIBRATION ISOLATOR
GV	GATE VALVE	VP	VELOCITY PRESSURE
HC	HEATING COIL	VR	VENT RISER
HE	HEAT EXHUST	WB	WET BULB
HI	HUMIDITY INDICATOR	WFS	WATER FLOW SWITCH
HP	HORSE POWER	WPD	WATER PRESSURE DROP

MECHANICAL PIPING SYMBOLS

GATE VALVE	FLOW SWITCH
BUTTERFLY VALVE	DIFFERENTIAL PRESSURE TRANSMITTER
GLOBE VALVE	PRESSURE GAUGE
BALANCE VALVE	DIFFERENTIAL PRESSURE GAUGE
CHECK VALVE	THERMOMETER
BALL VALVE	THERMO WELL
NEEDLE VALVE	THERMAL BULB
STOP COCK VALVE	INSERTION FITTING (PETE'S PLUG)
PRESSURE REDUCING VALVE	MANUAL AIR VENT
PRESSURE RELIEF VALVE	AUTOMATIC AIR VENT
PLUG VALVE	VACUUM BREAKER
OS & Y VALVE	FLEXIBLE CONNECTION (METALLIC)
AUTOMATIC CONTROL VALVE	FLEXIBLE CONNECTION (NON-METALLIC)
2-WAY CONTROL VALVE	EXPANSION JOINT
BUTTERFLY VALVE (WITH OPERATOR)	PIPE ANCHOR
SOLENOID VALVE	ALIGNMENT GUIDE
3-WAY CONTROL VALVE	FLANGED JOINT/BLIND FLANGE
ANGLE VALVE	UNION
SAFETY RELIEF VALVE	RESTRICTION ORFICE
TRIPLE DUTY VALVE	CONCENTRIC REDUCER
FLOW CONTROL VALVE	ECCENTRIC REDUCER
STRAINER	PIPE CAP
STEAM TRAP	PIPE BREAK
DISCHARGE ELBOW	ELBOW UP
FUNNEL DRAIN (OPEN)	ELBOW DOWN
PUMP	TEE UP
FLOW METER	TEE DOWN
	FLOW DIRECTION ARROW
	FLOW DIRECTION ARROW (FUTURE)

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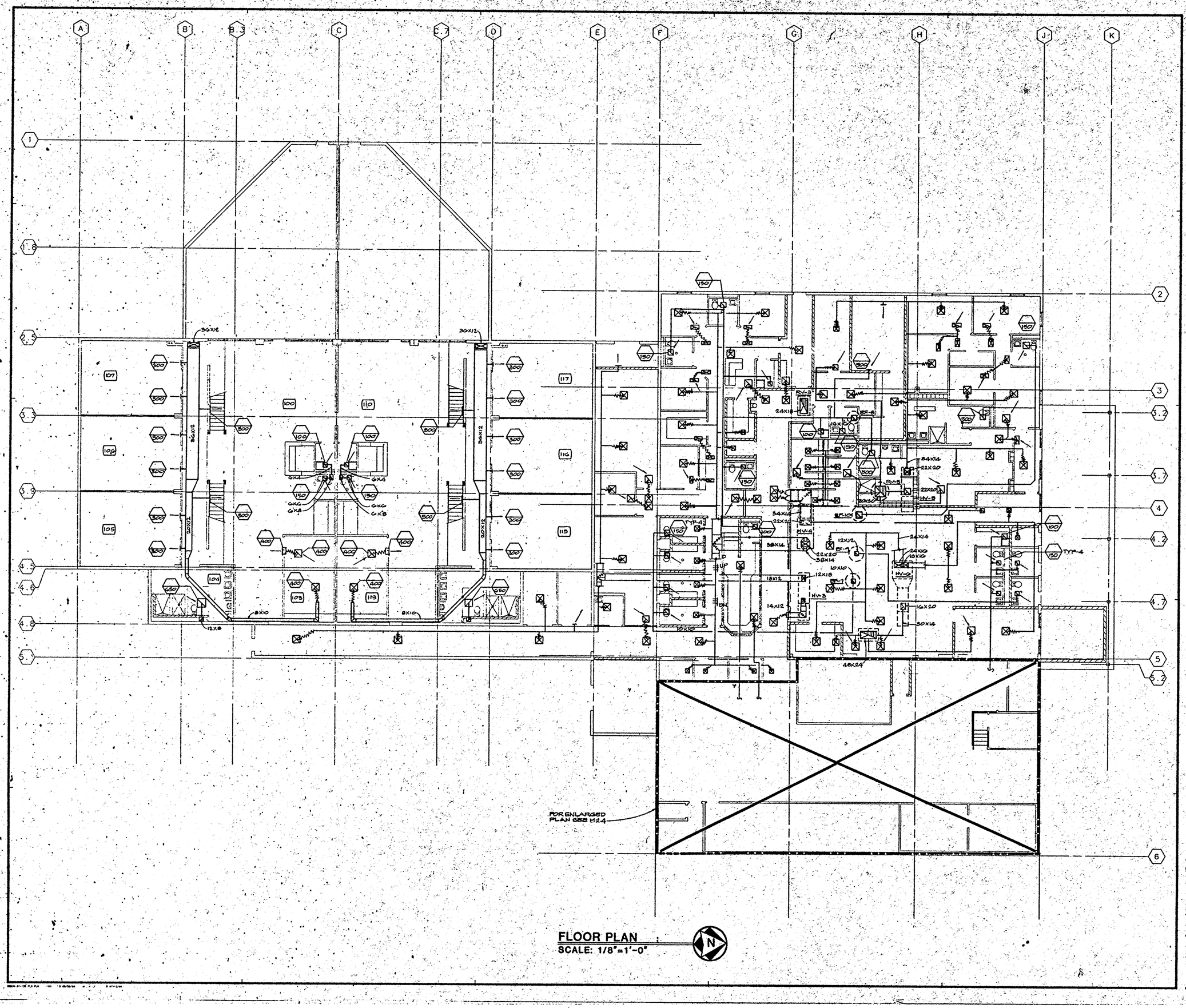
LAURENCE PALLA
M18238 EXP. 9-30-93

NO.	DESCRIPTION	DATE
-	D.D. PACKAGE	8/6/90

PROJECT:
MEDIUM SECURITY JAIL
COUNTY OF SANTA CRUZ
WATSONVILLE, CALIFORNIA

DWG. TITLE:
SYMBOLS, ABBREVIATIONS, SCHEDULES AND INDEX

JOB NO: 89175 DWG. NO: M0.1
DATE:
SCALE: NONE



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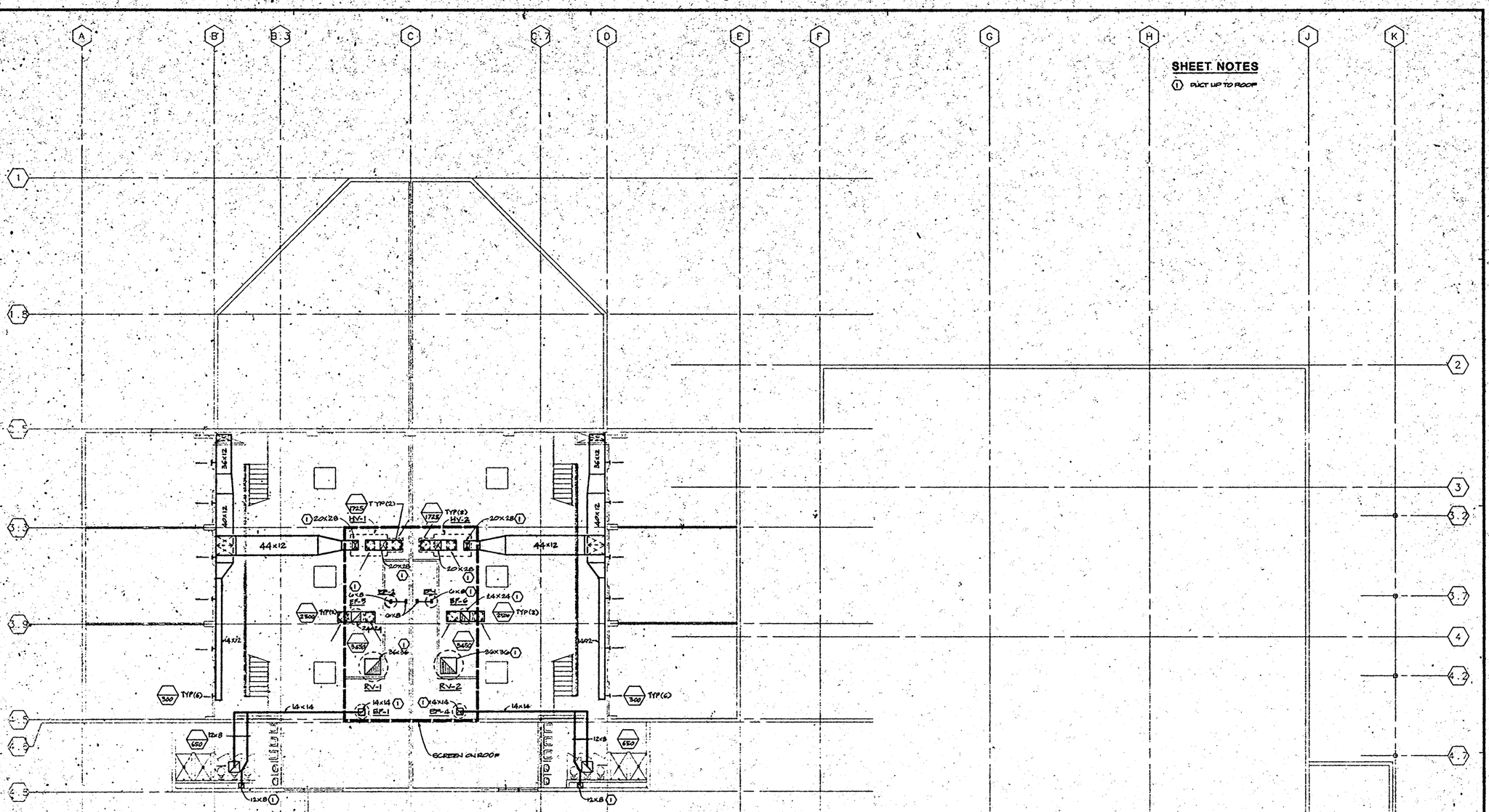
M1378 EXP. 7-31-90

NO.	DESCRIPTION	DATE
—	D.D. PACKAGE	8/6/90

PROJECT:
MEDIUM SECURITY JAIL
COUNTY OF SANTA CRUZ
WATSONVILLE, CALIFORNIA

DWG. TITLE:
LOWER LEVEL FLOOR PLAN

JOB NO: 89175 DWG. NO:
DATE:
SCALE: 1/8" = 1'-0"
0' 8' 16'
M2.1



SHEET NOTES

1. DUCT UP TO ROOF

UPPER LEVEL FLOOR PLAN

SCALE: 1/8"=1'-0"

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NO.	DESCRIPTION	DATE
—	D.D. PACKAGE	6/6/90

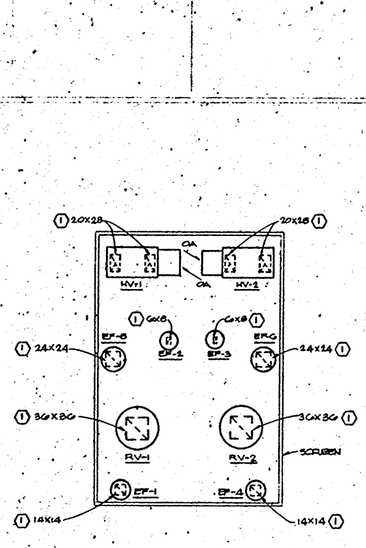
PROJECT:
MEDIUM SECURITY JAIL
COUNTY OF SANTA CRUZ
WATSONVILLE, CALIFORNIA

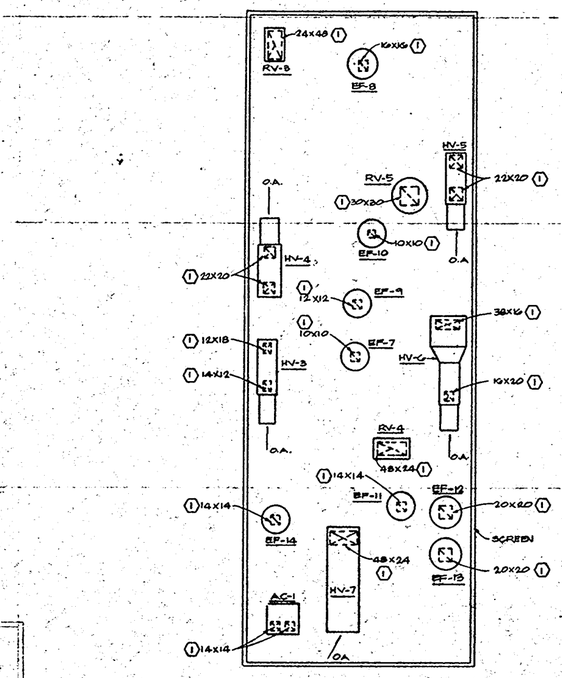
DWG. TITLE:
UPPER LEVEL FLOOR PLAN

JOB NO: 89175 DWG. NO: M2.2
DATE:
SCALE: 1/8" = 1'-0"
0' 8' 16'

SHEET NOTES

① DUCT THRU ROOF





ROOF PLAN
SCALE: 1/8"=1'-0"

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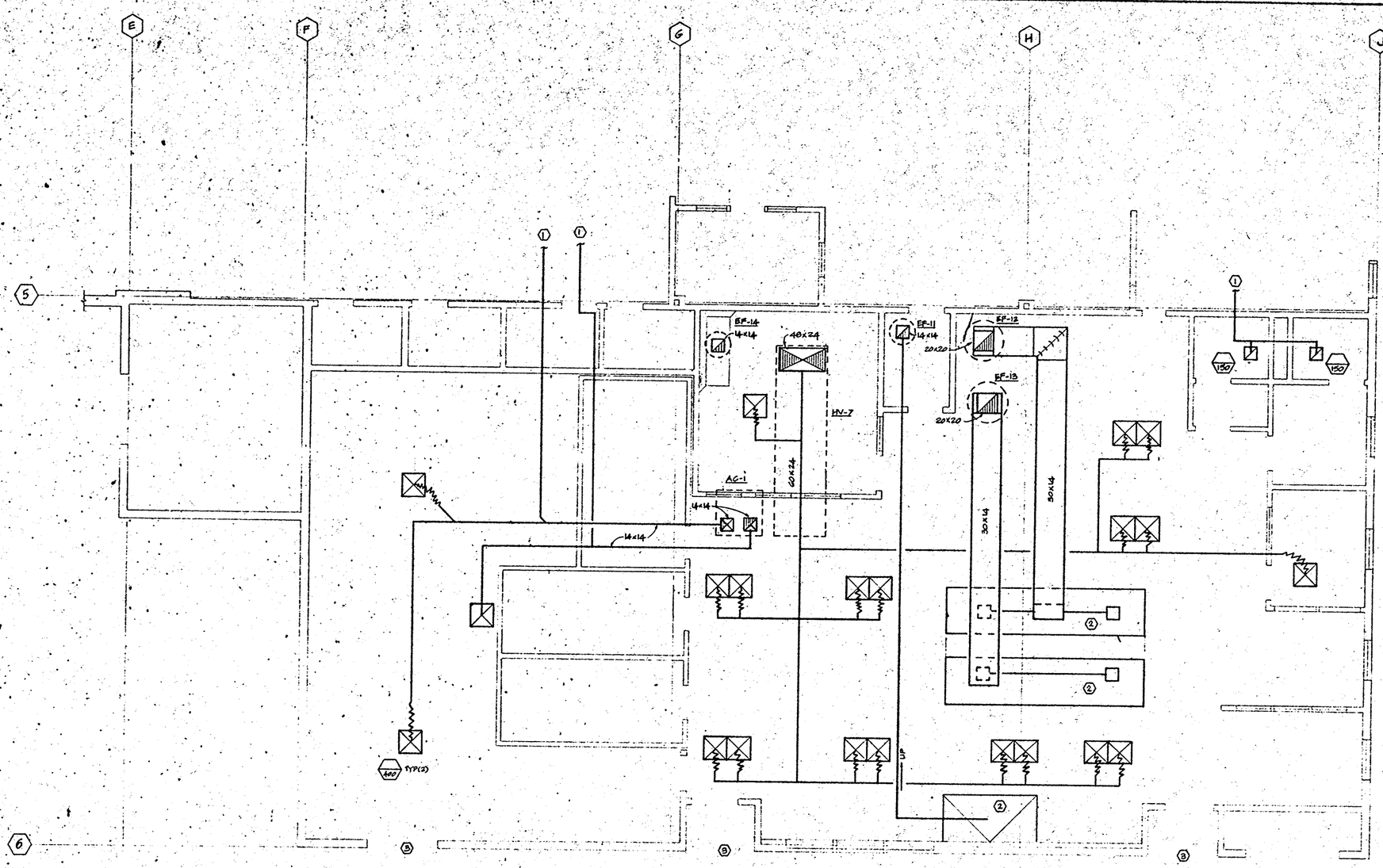
JOB No. 89039.01

NO	DESCRIPTION	DATE
—	D.D. PACKAGE	8/6/90

PROJECT:
MEDIUM SECURITY JAIL
COUNTY OF SANTA CRUZ
WATSONVILLE, CALIFORNIA

DWG TITLE:
ROOF LEVEL FLOOR PLAN

JOB NO: 89175
DWG. NO: M2.3
DATE:
SCALE: 1/8" = 1'-0"
0' 8' 16'



SHEET NOTES

1. FOR CONTINUATION SEE ENG. M2.1
2. HOOD
3. FLY MAN

KITCHEN FLOOR PLAN
SCALE: 1/4"=1'-0"

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NO.	DESCRIPTION	DATE
—	D.D. PACKAGE	8/6/90

PROJECT
MEDIUM SECURITY JAIL
COUNTY OF SANTA CRUZ
WATSONVILLE, CALIFORNIA

DWG TITLE
LOWER LEVEL ENLARGED PLAN

JOB NO. 89175 DWG NO. M2.4
DATE
SCALE 1/4" = 1'-0"
0' 4' 8'

90 ROUNTREE FACILITY STUDY
(HV1 & HV2)

90 ROUNTREE DETENTION FACILITY
OPERATIONS BUILDING
CITY OF SANTA CRUZ, CALIFORNIA

90 Rountree Ln.
Santa Cruz, California 95062

DATE: July 22, 2021

Prepared by:

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Project #: 2021P102

TABLE OF CONTENTS

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A. EXECUTIVE SUMMARY

This report presents a review of the existing Heating & Ventilation units (HV-1 & HV-2) for the Medium Detention Facility located at 90 Rountree Lane in Watsonville. The areas that HV-1 and HV-2 supply are the detention rooms S and R. The existing HV units are the original equipment for the facility placed into operation in the 1990's.

The equipment is located on the roof and was reviewed internally by removing the air handlers side panels. The internal condition of the units shows major deterioration to the air handler cabinet, structural frame, filter frame, heating coil and damper linkage. The review also found that the existing HV units were not designed for outdoors but were placed on the roof and retrofitted with sheet metal roof covers. The current condition of the units cannot be cleaned due to the corrosion and interior cabinet failure. The air quality of this unit is a potential hazard to the occupants within the space it serves. The air handling unit is holding moisture in the walls delivering humid air to the occupied space. Proper ventilation volumes are also in question due to failed damper control linkage for outside air and return air.

There are three primary failures of the HV units due to external component deterioration:

- Electrical disconnects/panels no longer air/weather tight due to corrosion failure
- HV unit cabinet no longer air/weather tight due to corrosion failure
- Hydronic heating valve no longer provides reliable operation

The excessive corrosion of the electrical panels should be reviewed to assure they are safe to continue operation if not replaced immediately.

It is the recommendation of Axiom Engineers to replace these units with a new air handler(s) for HV1 and HV2. In reviewing existing conditions with the General Services team, these detention areas have historically seen temperature that could exceed recommended ASHRAE comfort levels without cooling. Therefore, Axiom Engineers recommends choosing an air conditioning option (see Table 1 for cost structure) for replacement.

B. BACKGROUND

This report was commissioned by the County of Santa Cruz General Services Department to contract Axiom Engineers for Mechanical Engineering services to evaluate the existing Heating and Ventilation units (HV-1 & HV-2).

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C. ASSESSMENT METHODS

- Review of available existing mechanical plans - Medium Security Jail Plans created by Ehrlich Rominger and George A Greene Consulting Engineers dated August 1990.
- Field review of building and mechanical systems with General Services Department
- Interview Superintendent of Detention Facility – operation difficulties and improvement for benefits

D. BUILIDING AND OCCUPIED SPACE EVALUATION

The Rountree Detention Facility Building is a double-story structure, with a metal framed roof, reinforced concrete walls, and reinforced concrete slab floor. During the field review with General Services, the Medium Security Detention Area R and S plans indicated ventilation and heating by HV-1 & HV-2 the primary means of suppling air.

Detention areas R & S each have a common area with a lower and upper area for sleeping quarters. R & S are a mirror image of each other.

Each sleeping quarters has 8 beds. The lower floor has 3 sleeping quarters for a total of 24 beds. The second floor also has 3 sleeping quarter for a total of 24 beds. The total number of sleeping quarters for R and S is 48 inmates. HV-1 and HV-2 supply air for 96 inmates. There is open bathroom and showers areas to serve both lower and upper sleeping quarters. Buildings are continuously occupied requiring consistent air temperature & quality for all 96 inmates.

It was noted that the south wall for the detention area does heat up since the exposure is not insulated. The potential for improvement would be to possible line the exterior wall with a closed cell poly urethane insulation to control temperatures next to the beds that face this wall.

E. EXISTING HV-1 AND HV-2 DESCRIPTION

The Mechanical System is a heating only (no cooling) & ventilating ducted forced air system, located on the roof. HV-1 & HV-2 units air supply 5000 cfm each, includes two 100% outside air constant volume each & include filter rack with disposable poly ply filters, hot water coils & control valve, rail mounted, roof curb, included relay to interlock air handling unit with exhaust fan, motorized damper

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on return and outside air economizer, remote console starter, steel double wall insulated cabinet, outside air hood, and down discharged plenum. The existing plans also indicate a total of six exhaust air fans, two roof vents, and the two air handling units. The hydronic heating coil for HV-1 and HV-2 are supplied by (2) existing boilers located in the Mechanical Room which also supply the entire facility. The boilers were not reviewed for this report but should be reviewed in the next step of design to assure that the boiler does not fail during the process of this retrofit.

F. EXISTING HV-1 and HV-2 EVALUATION

The existing condition of HV-1 and HV-2 shown in picture-1 was field reviewed on site with General Services Department. The interior of the air handler was inspected by removing the air handlers side panels. The internal condition of the air handler shows major deterioration to the air handler cabinet insulation, structural frame, filter frame, heating coil and damper linkage. See Pictures 2,3 and 4, for the interior of the air handler coil, filter, and cabinet. The current condition is at a critical state of failure for air quality & pressurization to the occupied space. Recommendation is to replace this equipment with a new unit as soon as possible.

The review also confirmed that these existing HV units were not designed for outdoor use but were placed on the roof and retrofitted with sheet metal roofing. See picture 5 showing the sheet metal roofing over the air handling unit. The current condition of the units cannot be cleaned due to the corrosion and cabinet failure. The air handling unit holds moisture in the walls during the wet season delivering humid air to the occupied space. Automatic heating valve operation has failed & often requires manual adjustment by operator when needed. Proper ventilation volumes are also in question due to failed damper control linkage for outside air and return air.

The most concerning element failure is the electrical panels supplying the HV units. Major rusting and corrosion to the electrical panels should be reviewed to assure that they are safe to continue operation if not replaced.

The scope as defined by the client did NOT include the following equipment however, this should be reviewed prior to the final selection of the equipment for design:

- Boilers & Pumps
- Exhaust Fans
- Air & water balance

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G. EXISTING HV-1 and HV-2 PICTURES

Picture 1: EXISTING HV-1 AND HV-2

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Picture 2: EXISTING HEATING COIL

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Picture 3: EXISTING FILTERS

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Picture 4: EXISTING AIR HANDLER CABINET CONDITION

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Picture 5: EXISTING HV-1

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Picture 6: EXISTING ELECTRICAL PANELS

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H. PROPOSED OPTIONS

Three separate proposed options are presented below as replacement options to address the deficiencies above.

- **Option 1 (2 units heating and ventilation):** Replace both HV-1 and HV-2 in kind with two new units designed for outdoor installation, equipped with Variable Frequency Drive (VFD), BACNET control, remote control of damper settings, temperature, air volume and economizer setting.
- **Option 2 (2 units heating, ventilation, and air conditioning):** Replace both HV-1 and HV-2 with new unit's design for outdoor installation, including **air conditioning** capabilities, equipped with Variable Frequency Drive (VFD), BACNET control, remote control of damper settings, temperature, air volume and economizer setting.
- **Option 3 (1 unit heating and ventilation to replace both HV-1 and HV-2):** Replace both HV-1 and HV-2 with one new unit design for outdoor installation including **air conditioning** capabilities, equipped with Variable Frequency Drive (VFD), BACNET control, remote control of damper settings, temperature, air volume and economizer setting.

The following is a table summarizing recommended options & an engineer's opinion of probable cost. Appendix C has broken out line-item cost estimates for each item. Design & administration costs are not included in the pricing below & 15% to 20% should be added to the construction costs to account for soft costs.

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Table 1

Summary of Recommended Actions and Cost Opinions

OPTION	RECOMMENDED ACTIONS	OPINION OF PROBABLE TOTAL COST
1	A. REPLACE BOTH EXISTING HV-1 AND HV-2 WITH TWO NEW VARIABLE SPEED AIR HANDLERS B. Hydronic heating coil to be supplied with units and connected to existing hydronic heating supply and return piping at roof level. C. Revise ductwork for connecting existing supply and return ductwork. D. Replace exhaust fans that support HV-1 and HV-2 air balance. E. Provide new unit with BACnet control connection. F. Replace or install building controls with connection to existing digital county level BACnet based control system. G. Perform complete air & water balance for new HV-1 and HV-2.	$184,100
2	A. REPLACE BOTH EXISTING HV-1 & HV-2 WITH TWO NEW VARIABLE SPEED HVAC UNITS WITH DUAL CIRCUIT COOLING CAPABILITY B. Hydronic heating coil to be supplied with units and connected to existing hydronic heating supply and return piping at roof level. C. Revise ductwork for connecting existing supply and return ductwork. D. Replace exhaust fans that support HV-1 and HV-2 air balance. E. Provide new unit with BACnet control connection. F. Replace or install building controls with connection to existing digital county level BACnet based control system. G. Perform complete air & water balance for new HVAC-1 and HVAC-2.	$198,500
3	A. REPLACE BOTH EXISTING HV-1 & HV-2 WITH ONE NEW VARIABLE SPEED AIR HANDLER. B. Hydronic heating coil to be supplied with unit and	$166,500

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	connected to existing hydronic heating supply and return piping at roof level. C. Revise ductwork for connecting existing supply and return ductwork. D. Replace exhaust fans that support HV-1 and HV-2 air balance. E. Provide new unit with BACnet control connection. F. Replace or install building controls with connection to existing digital county level BACnet based control system. G. Perform complete air & water balance for new HVAC-1.	

The cost opinions offer approximate installed costs of various suggested Building upgrades as outlined in the Proposed options section of this report. Final construction cost will ultimately depend upon detailed design specifications & bid conditions, which are not provided or guaranteed by this report.

I. RECOMMENDATION

All the options presented above will correct current air quality & air balance deficiencies. Maintenance will be capable of servicing the equipment with minimal effort as the equipment will be at the beginning of equipment life vs. end of equipment life.

It is recommended that a Heating Ventilation and Air Conditioning unit be installed since there is an historical temperature issue in the detention areas. The concrete exterior walls are not insulated; therefore, it is also recommended that the units remain dependent for each space for temperature control. A single unit may also create installation issues (electrical, mounting/structural, added ductwork) since there are two existing units on the roof today. The two unit option offers more flexibility for future occupancy or layout changes.

During the review process, one of the comments from the Sherriff's Superintendent was that an inmate that is in a hot environment is harder to handle than an inmate that is in a comfort control environment. Adding cooling was viewed as a notable benefit to the Superintendent since staff must address more issues when inmates are not comfortable.

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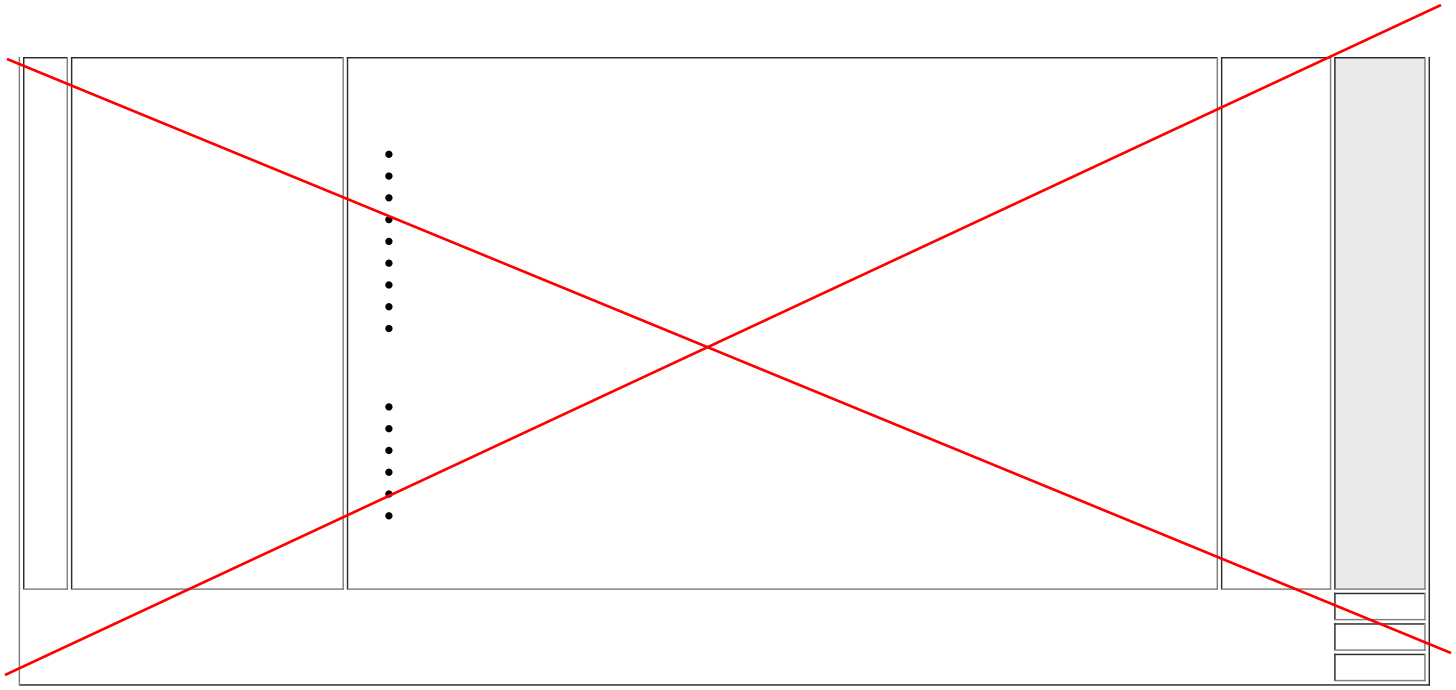
Quotation

11/4/21

Comments or Special Instructions:
F.O.B. Orlando, FL (Untimed LTL Freight Included).
Standard warranty begins from date of Start-Up or 18 months from date of ship.
Standard Warranty includes (5) year Compressor, (1) year parts, (20) Stainless Steel Heat Exchangers.
Equipment start-ups are completed in one trip.

QTY	PART NUMBER	DESCRIPTION	UNIT PRICE	AMOUNT
2	UPC-TC14HKT000A00D-BFGVY9 Unit Tag: 12.5 Ton HP	**100% OA UltraDry Packaged Heat Pump, 12.5 Nominal Tons, 460/3/60, R410a, TC14 Chassis** **Standard Features:** • **2-Stage Cooling** • **Variable Speed Supply Blower Motor - HIGH** • **Fully Modulating Hot Gas Reheat** • **Refrigerant Capacity Control Device - First Stage** • **Thermostat Control** • **NO CONTROLS** • **NO DISCONNECT** • **Horizontal Discharge Configuration** • **Non-Corrosive Composite Drain Pan** Options: • V - LOW AMBIENT HEAD PRESSURE CONTROL • Y - START UP • 9 - CRATE • F - MERV 13 2” FILTER (RESIDENTIAL SPLITS 1”) • B - WHOLE UNIT CORROSION RESISTANT COATING • G - 2 POSITION OUTSIDE AIR DAMPER ****ESTIMATED LEAD TIME** 15 WEEKS**		



Exclusions
No extra belts or filters, curbs, equipment pads, pitched or vibration isolation curbs, power exhaust, seismic restraints or vibration isolation, filter racks for
disposable filters, condensate overflow switches, condensate pumps, hinged access doors, additional drain pans if required, hanging kits, line or low voltage wire
or wiring, conduit, refrigerant piping or charging, extended parts or labor warranties, installation, commissioning, service, supervision or owner training unless
requested, rigging or handling, storage, or any other options not listed above.

TYPICAL OF TWO

Hot Water Coil

Tag	Qty	Model	Footnotes	Comment
C-1	1	W8-3636-08B-4CA-R	a	

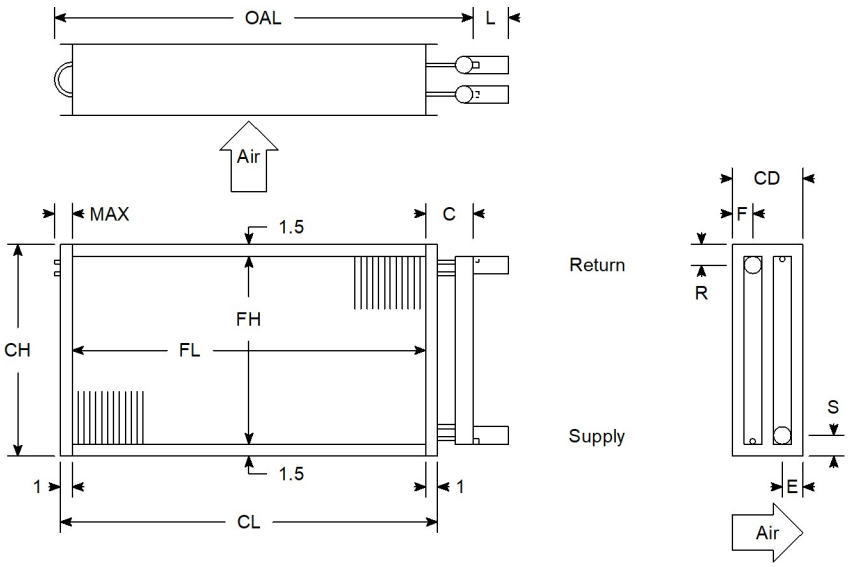
Construction and Performance Details

Tag	C-1
Air flow (SCFM)	5000
Altitude (ft)	0
Total capacity (MBH)	285.8
Entering dry bulb (°F)	28.0
Leaving dry bulb (°F)	80.8
Face velocity (ft/min)	556
Air pressure drop (in of water)	0.19
Air fouling factor (h·ft²·°F/Btu)	0.00000
Fluid	W
Entering fluid temp. (°F)	180.0
Leaving fluid temp. (°F)	130.0
Fluid flow rate (GPM)	11.7
Fluid velocity (ft/s)	3.18
Fluid pressure drop (ft of water)	5.7
Fluid fouling factor (h·ft²·°F/Btu)	0.00000
Fluid freezing temp. (°F)	32.0
Min. tube wall temp. (°F)	119.5
Coils per bank	1
Coil type	5/8
Fin height (in)	36.0
Fin length (in)	36.0
Face area (ft²)	9.00
Rows	2
Fin spacing (fins/in)	8
Fin material	Al
Fin type	Sine
Fin thickness (in)	0.006
Tube wall thickness (in)	0.020
Turbulators	No
Number of feeds	4
Supply conn. size (in)	1.000
Return conn. size (in)	1.000
Weight (lb)	71
Est. operating wt. (lb)	91
Est. internal volume (ft³)	0.36

Footnotes

(a) Tube OD 0.625, Tube spacing 1.500 x 1.299

Drawings‡



‡ Vent/drain diameter: 1/2", type: FPT, location: Face.

*Dimensions**

Tag	**C-1**
Model	W8-3636-08B-4CA-R
Weight	71
Fin material & type	0.006 Aluminum Sine-wave
Tube wall	0.02 / Smooth
Casing material / flange	16 ga. galv. steel (std) / Stacking
Coating	None
Turbulators	No
Header diameter	1.125
Supply / return conn. size	1 / 1
Connection type	MPT Copper
Number of feeds	4
FH / FL	36 / 36
CH / CL	39 / 38
OAL / CD	42.5 / 6.5
C	4.25
S / R	2 / 2
E / F	2.6 / 2.6
L / MAX	2 / 2.25

* All distances are measured as inches.

Project Submittal Information

Project

Roundtree Jail

Date

08/24/2021 17:27:39

Revision 4287-3

UNIT DATA

Project Name: Roundtree Jail
Model Number: UPC-TC14HHT000A00D-BFGVY9 Tag: 12.5 Ton HP
Quantity: 1

Base Unit

Model Number: UPC-TC14HHT000A00D-BFGVY9
Unit Type: Packaged Heat Pump
Nominal Tonnage: 12.5
Voltage: 208/3/60
Heating Type: Electric
Control Type: THERMOSTAT CONTROL
Configuration: HIGH,Horizontal
Disconnect: NO DISCONNECT

Unit Options

V - LOW AMBIENT HEAD PRESSURE CONTROL
Y - START UP
9 - CRATE
F - MERV 13 2” FILTER (RESIDENTIAL SPLITS 1”)
B - WHOLE UNIT CORROSION RESISTANT COATING
G - 2 POSITION OUTSIDE AIR DAMPER

Standard Features

- Pre-painted exterior panels and primer-coated interior panels tested to 500 hours salt spray protection.
- Exclusive non-corrosive condensate pan in accordance with ASHRAE 62 Standard.
- Scroll compressors with internal line-break overload protection.
- Standard throwaway filter.
- Liquid line filter-driers, Suction Accumulator, & Liquid Receiver.
- 0~100% Outside air applications.
- Fully modulating hot gas reheat.
- Refrigerant management control thru capacity control device.
- Variable frequency drive factory set to specified cfm.
- Evaporator freeze protection on all stages.

PERFORMANCE DATA

Project Name: Roundtree Jail
Model Number: UPC-TC14HHT000A00D-BFGVY9 Tag: 12.5 Ton HP
Quantity: 1

Cooling Performance

Site Elevation:	**79 ft.**
Total Capacity:	**134 MBH**
Sensible Capacity:	**134 MBH**
Efficiency (at ARI):	**10.6 EER**
Part Load Efficiency:	**10.7 IEER**
Entering Outside DB Temp:	**100°F**
Entering Outside WB Temp:	**70°F**
Mixed Air DB Temp:	**100°F**
Mixed Air WB Temp:	**70°F**
Leaving DB Temp:	**74.1°F**
Leaving WB Temp:	**61.7°F**

Reheat Performance

Total Capacity:	**50.6 MBH**
Entering Outside DB Temp:	**74.1°F**
Leaving DB Temp:	**83.5°F**

Heating Performance

Entering Outside DB Temp:	**30°F**
Mixed Air DB Temp:	**30°F**
Leaving DB Temp:	**49.3°F**
Heat Pump Capacity @ 17 F°:	**76 MBH**
Heat Pump Capacity @ 47 F°:	**142 MBH**
Nominal Electric Heat:	**0 KW**
Applied Electric Heat:	**0 KW**
Stages:	**NO CONTROLS**

Supply Air Blower Performance

Supply Air:	**5000 CFM**
Outside Air:	**5000 CFM**
External Static Pressure:	**1 lwg**
Nominal Motor Rating:	**5 HP**
Unit Configuration:	**Horizontal**
Unit Operating Weight	**1362 lbs**
Outdoor Sound Power @ 250Hz	**80.3 dBA**

Electrical Data

Unit Voltage:	**208/3/60**
Supply Motor FLA:	**20.4 amps**
Electric Heat FLA:	**0 amps**
Compressor RLA A:	**22.4 amps**
Compressor RLA B:	**22.4 amps**
Condenser Fan Quantity:	**3**
Condenser Fan Amps(ea):	**1.5 amps**
Power Supply MCA:	**75.3 amps**
Power Supply MOCP:	**90 amps**

THERMOSTAT CONTROL MODEL

FAN SPEED CONTROL

These units are equipped with variable speed supply fan control. There is a fan speed set point. This should be set by the test and balance contractor to provide and correct CFM for the unit. Once the supply fan speed is initially set, it will not modulate.

NORMAL HOURS (not night set back)

Cooling Mode (humidistat on cooling) –When the temperature gets above the set point temperature by more than 2 degrees, the compressor will come on and start cooling the air. Once the temperature reaches the set-point, the compressor will turn off and the air will continue to circulate in the space without heating or cooling.

Heating Mode (humidistat on heating) – When the temperature gets below the set point temperature by more than 2 degrees, the heat pump will come and begin heating the air. Once the temperature reaches the set point temperature, the heat pump will turn off and the air will continue to circulate in the space without heating or cooling.

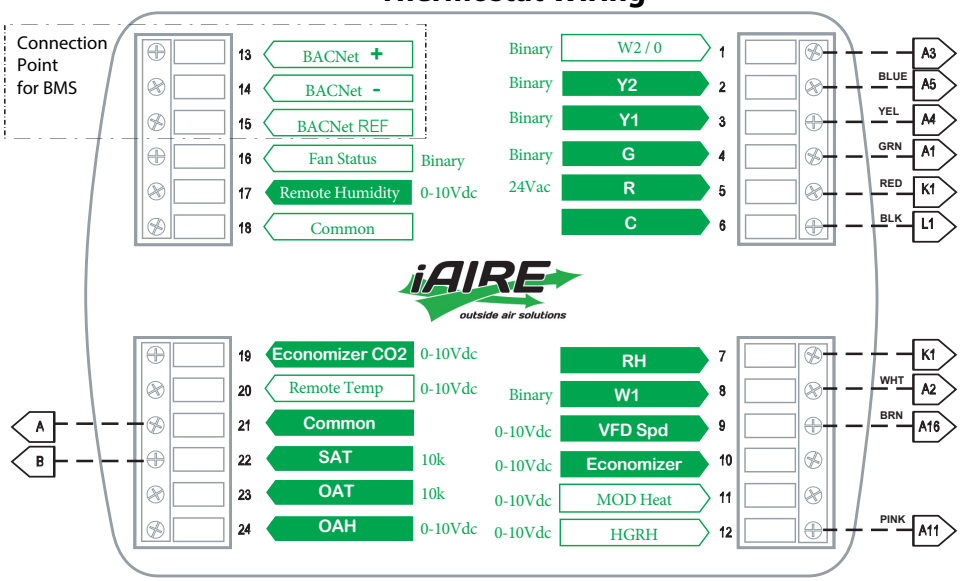
Humidity mode – When the unit is not running in cooling or heating and the humidity sensor on the humidistat registers a humidity higher than the set point humidity, the compressor will come on for cooling and the hot gas modulating valves will modulate to control the discharge air temperature (DAT) of the unit to an operated entered DAT setpoint. This will help reduce the humidity without over cooling the building. Once the humidity is below the set point humidity, the unit compressor and hot gas modulating valves will shut off and the air will continue to circulate in the space without heating or cooling.

***NIGHT SET BACK HOURS**
Allows the occupant to set a schedule across the 7 day, 24 hour week to schedule set back temperatures at night to conserve energy.

***UNOCCUPIED HOURS**
Allows the occupant to set a schedule across the 7 day, 24 hour week to schedule the unit off to conserve energy. This shuts the OA damper or economizer if present on the unit.

***NIGHT SETBACK**
Available through BACNet calendar or remote digital input.

Thermostat Wiring

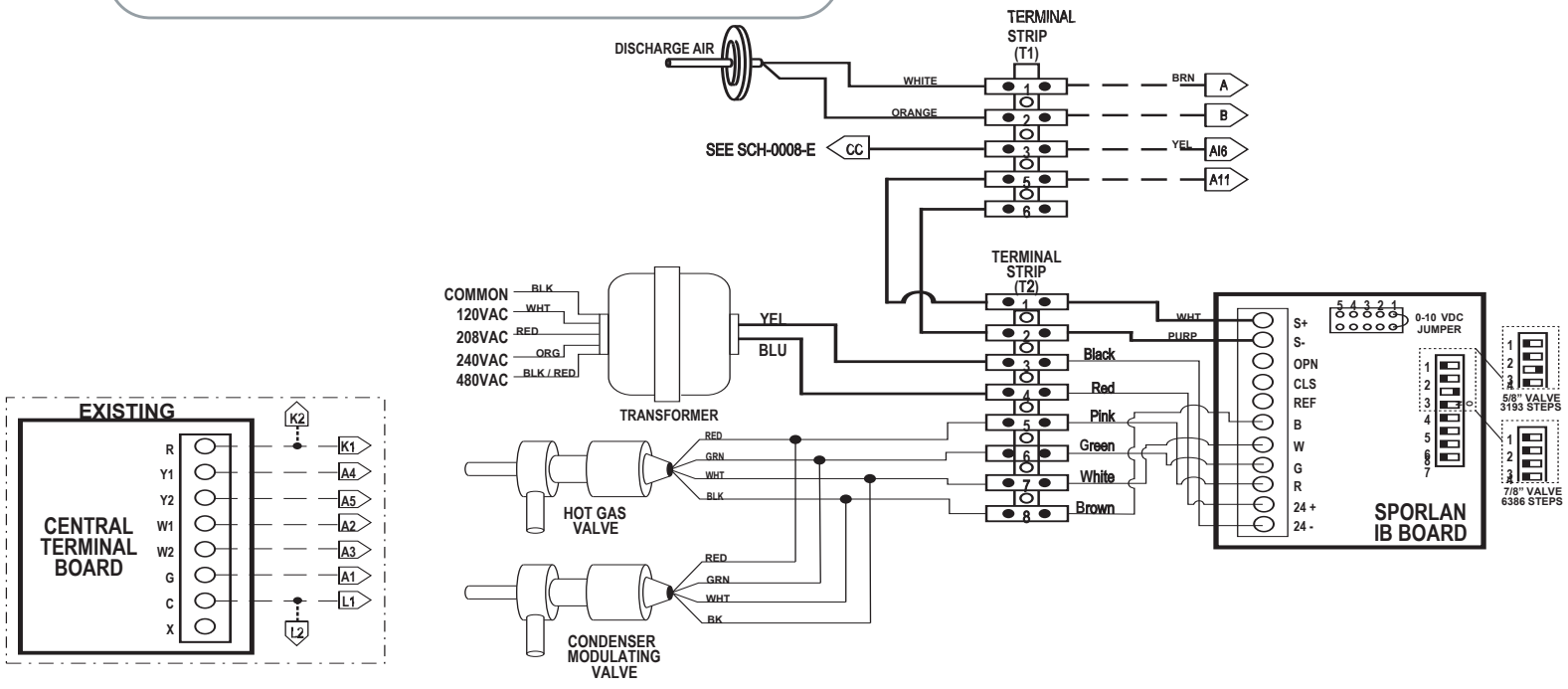


NOTE 1: All field wiring must be shielded cable or twisted pair with drain wire.

NOTE 2: Field installed discharge air sensor minimum 2 ft. From supply.

NOTE 3: Actual number of heating and cooling stages may vary, see factory RTU board for required connections.

— — — — FIELD SUPPLIED WIRING

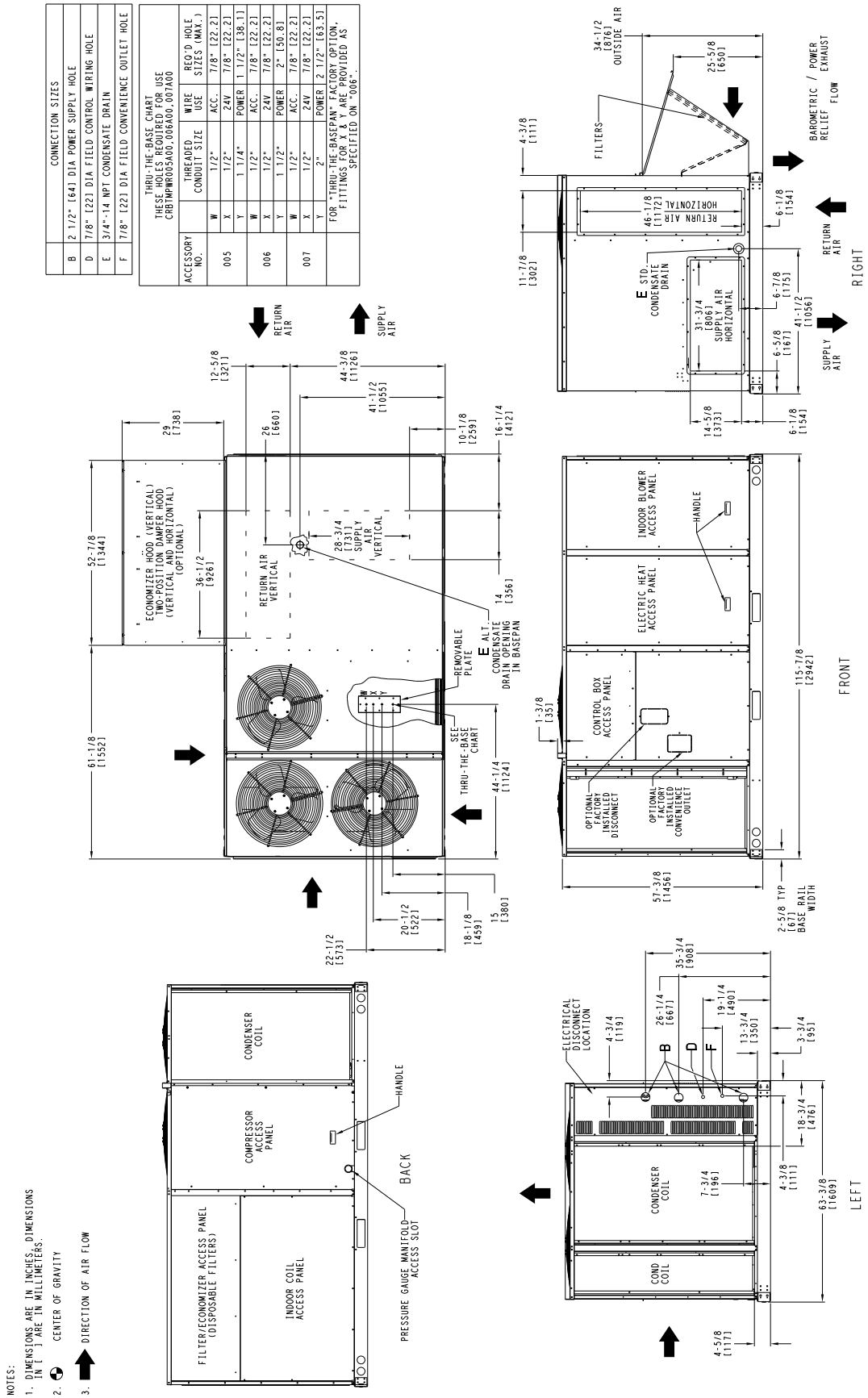


	CONNECTION SIZES
B	2 1/2" [64] DIA POWER SUPPLY HOLE
D	7/8" [22] DIA FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	7/8" [22] DIA FIELD CONVENIENCE OUTLET HOLE

THRU-THE-BASE CHART
THESE HOLES REQUIRED FOR USE CRBTMPWR005A00,006A00,007A00

ACCESSORY NO.		THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
005	W	1/2"	ACC.	7/8" [22.2]
	X	1/2"	24V	7/8" [22.2]
	Y	1 1/4"	POWER	1 1/2" [38.1]
006	W	1/2"	ACC.	7/8" [22.2]
	X	1/2"	24V	7/8" [22.2]
	Y	1 1/2"	POWER	2" [50.8]
007	W	1/2"	ACC.	7/8" [22.2]
	X	1/2"	24V	7/8" [22.2]
	Y	2"	POWER	2 1/2" [63.5]

FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR X & Y ARE PROVIDED AS SPECIFIED ON "006".



NOTES:
1. DIMENSIONS ARE IN INCHES. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW

Center of Gravity			
	X	Y	Z
TC14	57 1/2 in [1460 mm]	29 1/2 in [750 mm]	24 in [610 mm]

RTU Clearances			
A	B	C	D
48 in [1219 mm]	42 in [1067 mm]	36 in [914 mm]	42 in [1067 mm]