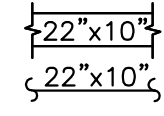
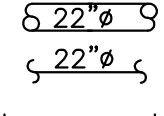
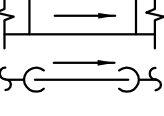
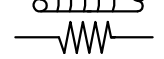
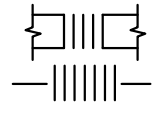
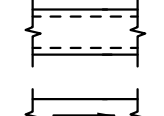
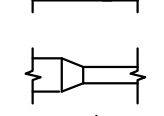
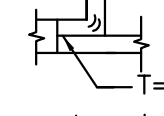
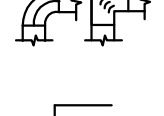
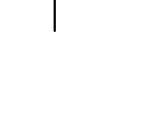

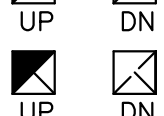
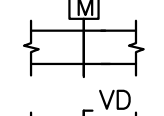
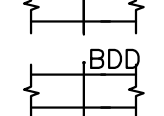
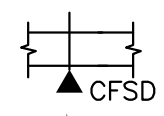
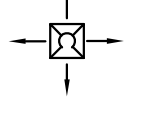
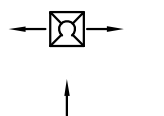
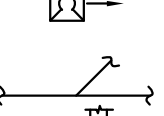
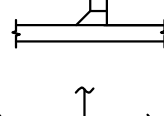
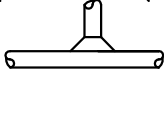
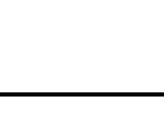
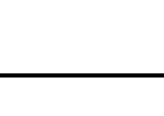
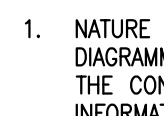
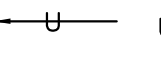

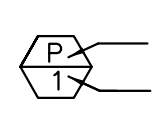
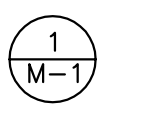

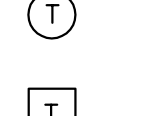
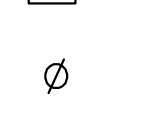
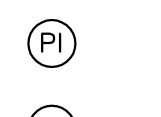
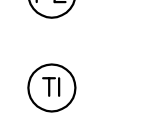
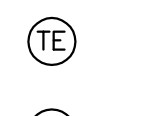
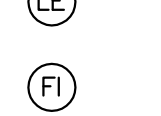
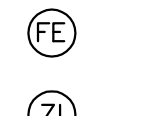
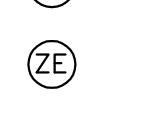
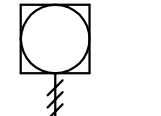
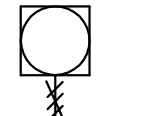
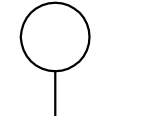
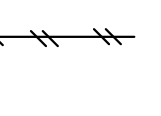



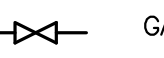
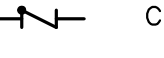


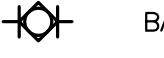
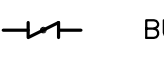
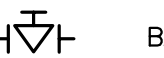



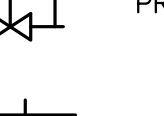

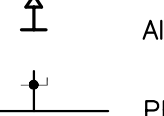

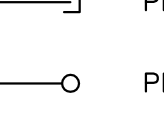
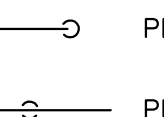
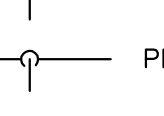
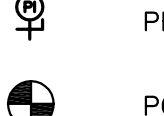



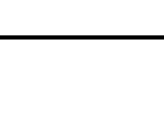
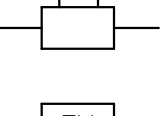
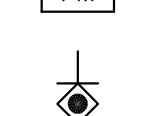
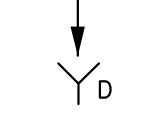
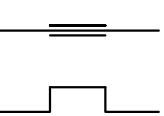
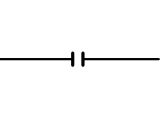
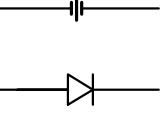
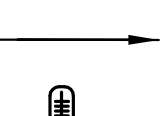
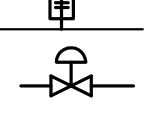
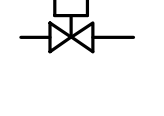





HVAC LEGEND				MEP COMPONENT ANCHORAGE NOTE	
DUCTWORK SYMBOLS		GENERAL SYMBOLS	PIPING SYMBOLS	ABBREVIATIONS	
                      	<p>DOUBLE-LINE AND SINGLE LINE RECTANGULAR DUCT, FIRST NUMBER INDICATES SIDE IN VIEW IN INCHES, SECOND NUMBER INDICATE SIDE IN DEPTH IN INCHES</p> <p>DOUBLE-LINE AND SINGLE-LINE ROUND DUCT NUMBER INDICATES DIAMETER IN INCHES</p> <p>INCLINED RISE OR DROP IN DIRECTION OF AIR FLOW</p> <p>FLEXIBLE DUCT</p> <p>FLEXIBLE CONNECTION</p> <p>LINED DUCT</p> <p>DIRECTION OF AIR FLOW</p> <p>TRANSITION</p> <p>THROAT SIZE IN INCHES</p> <p>RADIUS ELBOW WITH TURNING VANES & MITER ELBOW WITH TURNING VANES</p> <p>VANED ELBOW OR LONG RADIUS ELBOW (USE SHORT RADIUS ELBOW WHERE SPACE WILL NOT PERMIT THE USE OF LONG RADIUS ELBOW)</p> <p>SUPPLY AIR DUCT (UP AND DOWN)</p> <p>RETURN AIR DUCT (UP AND DOWN)</p> <p>EXHAUST AIR DUCT (UP AND DOWN)</p> <p>MOTORIZED DAMPER WITH ACCESS DOOR</p> <p>MANUAL VOLUME DAMPER</p> <p>BACKDRAFT DAMPER WITH ACCESS DOOR</p> <p>COMBINATION FIRE/SMOKE DAMPER WITH ACCESS DOOR</p> <p>SQUARE OR RECTANGULAR CEILING DIFFUSER (SUPPLY) 4-WAY</p> <p>SQUARE OR RECTANGULAR CEILING DIFFUSER (SUPPLY) 2-WAY</p> <p>SQUARE OR RECTANGULAR CEILING DIFFUSER (SUPPLY) 2-WAY CORNER</p> <p>RECTANGULAR DUCT BRANCH</p> <p>CIRCULAR DUCT BRANCH</p>	<p>$\frac{D/L}{(SQ.FT.)}$ DOOR LOUVER (FREE AREA)</p> <p>$\frac{L}{(SQ.FT.)}$ WALL LOUVER (FREE AREA)</p> <p> UNDERCUT DOOR</p> <p> DUCT MOUNTED SMOKE DETECTOR</p> <p> EQUIPMENT DESIGNATION EQUIPMENT NO.</p> <p> DETAIL 1/SHEET M-1</p> <p> SQUARE OR RECTANGULAR CEILING REGISTER (RETURN OR EXHAUST)</p> <p> THERMOSTAT</p> <p> TEMPERATURE SENSOR</p> <p>\varnothing DIAMETER</p> <p> PRESSURE INDICATOR</p> <p> PRESSURE ELEMENT</p> <p> TEMPERATURE INDICATOR</p> <p> TEMPERATURE ELEMENT</p> <p> LEVEL ELEMENT</p> <p> FLOW INDICATOR</p> <p> FLOW ELEMENT</p> <p> POSITION INDICATOR</p> <p> POSITION ELEMENT</p> <p> EMS-CONNECTED ANALOG POINT.</p> <p> EMS-CONNECTED DIGITAL POINT</p> <p> LOCAL INSTRUMENT</p> <p> PNEUMATIC TUBING</p>	<p>—CHWS— CHILLED WATER SUPPLY</p> <p>—CHWR— CHILLED WATER RETURN</p> <p>—HHWS— HEATING HOT WATER SUPPLY</p> <p>—HHWR— HEATING HOT WATER RETURN</p> <p> GATE VALVE OR SHUT-OFF VALVE</p> <p> CHECK VALVE</p> <p> ANGLE VALVE</p> <p> GLOBE VALVE</p> <p> BALL VALVE</p> <p> BUTTERFLY VALVE</p> <p> BALANCING VALVE</p> <p> THREE-WAY VALVE</p> <p> PRESSURE RELIEF VALVE</p> <p> PRESSURE REDUCING VALVE</p> <p> STRAINER WITH HOSE END BLOWDOWN VALVE</p> <p> AIR VENT (AUTOMATIC OR MANUAL)</p> <p> PRESSURE/TEMPERATURE TAP</p> <p> FLEXIBLE CONNECTION</p> <p> PIPE CAP</p> <p> PIPE RISE</p> <p> PIPE DROP</p> <p> PIPE CONNECTION, BOTTOM</p> <p> PIPE CONNECTION, TOP</p> <p> PRESSURE GAUGE</p> <p> POINT OF CONNECTION</p> <p> POINT OF DISCONNECTION</p> <p> CALIBRATED BALANCING VALVE</p> <p> FLOW METER</p> <p> DRAIN VALVE</p> <p> ALIGNMENT GUIDE</p> <p> EXPANSION LOOP</p> <p> FLANGED CONNECTION</p> <p> UNION</p> <p> REDUCER</p> <p> DIRECTION OF FLOW</p> <p> THERMOMETER</p> <p> PNEUMATIC CONTROL VALVE</p> <p> ELECTRIC CONTROL VALVE</p>	<p>AD ACCESS DOOR</p> <p>AFD AUTOMATIC FIRE DAMPER</p> <p>AFF ABOVE FINISHED FLOOR</p> <p>AFS AIR FLOW STATION</p> <p>AH AIR HANDLING UNIT</p> <p>AMB AMBIENT</p> <p>AP ACCESS PANEL</p> <p>B BOILER</p> <p>BDD BACKDRAFT DAMPER</p> <p>BHP BRAKE HORSEPOWER</p> <p>BTU BTU PER HOUR</p> <p>CAV CONSTANT AIR VOLUME</p> <p>CB CIRCUIT BREAKER</p> <p>CD CEILING DIFFUSER</p> <p>CFM CUBIC FEET PER MINUTE</p> <p>CG CEILING GRILL</p> <p>CH CHILLER</p> <p>CHP CHEMICAL POT FEEDER</p> <p>CHP CHILLED WATER PUMP</p> <p>CHW CHILLED WATER</p> <p>CHWS CHILLED WATER SUPPLY</p> <p>CHWR CHILLED WATER RETURN</p> <p>CONT CONTINUOUS</p> <p>CR CEILING REGISTER</p> <p>CT COOLING TOWER</p> <p>CU FT CUBIC FEET</p> <p>CU IN CUBIC INCHES</p> <p>CV CONTROL VALVE</p> <p>CW CONDENSER WATER</p> <p>CWS CONDENSER WATER SUPPLY</p> <p>CWR CONDENSER WATER RETURN</p> <p>DB DRY BULB</p> <p>D DRAIN</p> <p>D/L DOOR LOUVER</p> <p>D.S. DISCONNECT SWITCH</p> <p>DP DIFFERENTIAL PRESSURE</p> <p>(E) EXISTING</p> <p>EA EXHAUST AIR</p> <p>EF EXHAUST FAN</p> <p>EFF EFFICIENCY</p> <p>EG EXHAUST GRILLE</p> <p>EMS ENERGY MANAGEMENT SYSTEM</p> <p>ESP EXTERNAL STATIC PRESSURE</p> <p>EW.T. ENTERING WATER TEMPERATURE</p> <p>F FILTER</p> <p>DEGREE FAHRENHEIT</p> <p>F/A FROM ABOVE</p> <p>F/B FROM BELOW</p> <p>FC FAN COIL UNIT</p> <p>FCV FLOW CONTROL VALVE (AUTOMATIC)</p> <p>FD FIRE DAMPER</p> <p>F.F. FOULING FACTOR</p> <p>F.H. FUME HOOD</p> <p>FLA FULL LOAD AMP</p> <p>FM FLOW METER</p> <p>FPM FEET PER MINUTE</p> <p>FSL FLOW SWITCH LOW</p> <p>FT FEET</p> <p>GAL GALLON</p> <p>GEV GENERAL EXCHANGE VALVE</p> <p>GPM GALLON PER MINUTE</p> <p>HEV HOOD EXCHANGE VALVE</p> <p>HHW HEATING HOT WATER</p> <p>HHWS HEATING HOT WATER SUPPLY</p> <p>HHWR HEATING HOT WATER RETURN</p> <p>HOA HAND-OFF-AUTO</p> <p>HP HORSEPOWER</p> <p>HS HAND SWITCH</p> <p>HWP HOT WATER PUMP</p> <p>HX HEAT EXCHANGER</p> <p>HZ HERTZ</p> <p>IN INCHES</p> <p>IW INDUSTRIAL WATER</p> <p>KW KILOWATT</p> <p>L LOUVER</p> <p>LB POUND</p> <p>LSV LABORATORY SUPPLY VALVE</p> <p>LWT LEAVING WATER TEMPERATURE</p> <p>MBH THOUSAND BTU PER HOUR</p> <p>MCA MINIMUM CIRCUIT AMP</p> <p>MCC MOTOR CONTROL CENTER</p> <p>MD MOTORIZED DAMPER</p> <p>NC NORMALLY CLOSED</p> <p>NG NATURAL GAS</p> <p>NO NORMALLY OPEN</p> <p>NTS NOT TO SCALE</p> <p>OBD OPPOSED BLADE DAMPER</p> <p>OFD OVERFLOW DRAIN</p> <p>OAHS OUTSIDE AIR HOOD</p> <p>OSA OUTSIDE AIR</p> <p>P PUMP</p> <p>P PRESSURE DROP</p> <p>PH PHASE</p> <p>PICCOP PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVE</p> <p>POC POINT OF CONNECTION</p> <p>POD POINT OF DISCONNECTION</p> <p>PRV PRESSURE REDUCING VALVE</p> <p>PSI POUNDS PER SQUARE INCH</p> <p>PSIG PSI GAUGE</p> <p>RA RETURN AIR</p> <p>RAH RETURN AIR HOOD</p> <p>RF RETURN FAN</p> <p>RH RETURN GRILL</p> <p>RG RELATIVE HUMIDITY</p> <p>RLA RATED LOAD AMP</p> <p>RPM REVOLUTIONS PER MINUTE</p> <p>RV RELIEF VALVE</p> <p>SA SUPPLY AIR</p> <p>SD SMOKE DETECTOR</p> <p>SEP AIR SEPARATOR</p> <p>SFD SMOKE/FIRE DAMPER</p> <p>SF SUPPLY FAN</p> <p>SG SUPPLY GRILL</p> <p>SOV SHUT-OFF VALVE</p> <p>SP STATIC PRESSURE</p> <p>SQ.FT. SQUARE FEET</p> <p>S.S. STAINLESS STEEL</p> <p>SW SWITCH</p> <p>T THROAT</p> <p>TYP TYPICAL</p> <p>UP THROUGH ROOF</p> <p>V VOLT</p> <p>VAV VARIABLE AIR VOLUME</p> <p>VD VOLUME DAMPER</p> <p>VFD VARIABLE FREQUENCY DRIVE</p> <p>WB WET BULB</p> <p>WC WATER COLUMN</p> <p>WG WATER GAUGE</p>	<p>ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON APPROVED CONSTRUCTION DOCUMENTS, WHERE NO DETAIL IS INDICATED, THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENT PRESCRIBED IN THE 2016 CBC, SECTIONS 1616A.1.18 THROUGH 1616A.1.26 AND ASCE 7-10 CHAPTER 13, 26, AND 30.</p> <p>1. ALL PERMANENT EQUIPMENT AND COMPONENTS.</p> <p>2. TEMPORARY OR MOVABLE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER.</p> <p>3. MOVABLE EQUIPMENT WHICH IS STATIONED IN ONE PLACE FOR MORE THAN 8 HOURS AND HEAVIER THAN 400 POUNDS ARE REQUIRED TO BE ANCHORED WITH TEMPORARY ATTACHMENTS.</p> <p>THE ATTACHMENT OF THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE, BUT NEED NOT TO BE DETAILED ON PLANS; THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT.</p> <p>A. COMPONENT WEIGHING LESS THAN 400 POUNDS AND HAVE A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT.</p> <p>B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF THE DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.</p> <p>FOR THOSE ELEMENTS THAT DO NOT REQUIRE DETAILS ON THE APPROVED DRAWINGS, THE INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD AND THE OWNER'S REPRESENTATIVE. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH ABOVE REQUIREMENTS.</p> <p>MEP COMPONENTS CONTAINING HAZARDOUS CONTENTS, SUCH AS GAS PIPES, SHALL NOT BE EXEMPTED PER ASCE 7, SEC. 13.1.3.</p>
PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE				<p>PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENT PRESCRIBED IN ASCE 7-10 SECTION 13.3 AS DEFINED IN ASCE 7-10 SECTION 13.6.8, 13.6.7, 13.6.5.6 AND 2016 CBC, SECTIONS 1616A.1.23, 1616A.1.24, 1616A.1.25, AND 1616A.1.28.</p> <p>THE BRACING AND ATTACHMENTS TO THE STRUCTURE SHALL BE DETAILED ON THE APPROVED DRAWINGS OR THEY SHALL COMPLY WITH ONE OF THE OSHPD PRE-APPROVALS (OPM#) AS MODIFIED TO SATISFY ANCHORAGE REQUIREMENT OF ACI 318, APPENDIX D.</p> <p>COPY OF THE BRACING SYSTEM INSTALLATION GUIDE OR MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF HANGING AND BRACING OF THE PIPE, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS.</p> <p>THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT HANGER AND BRACE LOADS.</p>	

GENERAL NOTES		HVAC NOTES	APPLICABLE CODES	SHEET INDEX	
<p>1. NATURE OF THE DRAWINGS: FOR THE PURPOSE OF CLARITY AND LEGIBILITY, THE DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC. ALTHOUGH SIZES AND LOCATION OF EQUIPMENT ARE DRAWN TO SCALE WHEREVER POSSIBLE, THE CONTRACTOR SHALL MAKE USE OF ALL DATA IN ALL OF THE CONTRACT DOCUMENTS, AND VERIFY THIS INFORMATION BEFORE ORDERING, FABRICATING, OR INSTALLING OF ANY MATERIALS.</p> <p>2. FIELD VERIFICATION: ALL EXISTING STRUCTURES, EQUIPMENT, DUCTWORK, PIPING, AND CONDUIT ARE NOT SHOWN IN THESE DRAWINGS. BEFORE BIDDING AND BEFORE BEGINNING ANY WORK, THE CONTRACTOR SHALL THOROUGHLY EXAMINE AND VERIFY ALL EXISTING CONDITIONS, POINTS OF CONNECTION, SIZES, LOCATION, INTERFERENCES, ETC. ALL NECESSARY ADJUSTMENTS REQUIRED TO FACILITATE THE NEW INSTALLATION SHALL BE MADE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.</p> <p>3. ELECTRICAL VERIFICATION: THE CONTRACTOR SHALL VERIFY EQUIPMENT'S ELECTRICAL CHARACTERISTICS WITH THE ELECTRICAL DRAWINGS PRIOR TO EQUIPMENT OR MATERIAL PURCHASE.</p> <p>4. DISCREPANCIES: THE CONTRACTOR SHALL BRING TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE, IN WRITING, ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THE CONTRACT DOCUMENTS, AND ANY CONFLICTS WITHIN THE CONTRACT DOCUMENTS. THIS SHALL BE DONE PRIOR TO THE START OF CONSTRUCTION IN EACH AREA SO ANY NECESSARY CLARIFICATIONS CAN BE ISSUED.</p> <p>5. PROVIDE ALL FITTINGS, TRANSITIONS, DAMPERS, VALVES AND OTHER DEVICES REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.</p> <p>6. ALL EQUIPMENT, DUCTS, PIPING, AND OTHER DEVICES AND MATERIALS INSTALLED OUTSIDE OF THE BUILDING OR OTHERWISE EXPOSED TO THE WEATHER SHALL BE COMPLETELY WEATHERPROOFED.</p> <p>7. STRUCTURAL MEMBERS: THE CONTRACTOR SHALL NOT BORE, NOTCH, OR IN ANY WAY CUT INTO ANY STRUCTURAL MEMBER WITHOUT WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER.</p> <p>8. SUPPORT AND SEISMIC RESTRAINTS:</p> <p>A. THE CONTRACTOR SHALL PROVIDE SUPPORT AND SEISMIC RESTRAINTS TO ALL PIPES, CONDUITS, AND DUCTWORK, IN ACCORDANCE WITH THE SMACNA "GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS".</p> <p>B. THE CONTRACTOR SHALL PROVIDE SUPPORT AND SEISMIC RESTRAINTS TO ALL EQUIPMENT IN ACCORDANCE WITH THE REQUIREMENTS OF STATE BUILDING CODE, TITLE 24, PART 2, VOLUME 2, CBC SECTION 1632.</p> <p>9. GRILLES, REGISTERS & DIFFUSERS SHALL BE INSTALLED SO THAT THEY FIT NEATLY IN THE CEILING OR WALL IN WHICH THEY ARE INSTALLED. EXPOSED SCREWS SHALL BE FINISHED TO MATCH THE INSTALLED DEVICE.</p> <p>10. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS AND/OR REQUIREMENTS OF THE CONTRACT DOCUMENTS.</p> <p>11. DIFFERENT MATERIALS SHALL BE ISOLATED TO PREVENT GALVANIC CORROSION.</p> <p>12. DUCTWORK, PIPING AND EQUIPMENT SHALL BE CLEANED BEFORE ERECTION. PROTECTIVE COVERS ON EQUIPMENT SHALL BE LEFT IN PLACE DURING CONSTRUCTION. EQUIPMENT SHALL BE ADEQUATELY PROTECTED AGAINST DAMAGE DURING CONSTRUCTION.</p> <p>13. DUCTWORK AND PIPING TERMINATED FOR LATER HOOK-UP SHALL BE EQUIPPED WITH A COVER ON THE OPEN END IMMEDIATELY AFTER INSTALLATION.</p> <p>14. THERMOSTAT/TEMPERATURE SENSOR:</p> <p>A. THE MOUNTING HEIGHT OF THE THERMOSTAT/TEMPERATURE SENSOR SHALL BE AT 48" A) CENTERLINE OF THE CONTROL, ABOVE FINISHED FLOOR</p> <p>B. WHEREAS AN OBSTRUCTION (SUCH AS BASE CABINET) OCCURS, THE MOUNTING HEIGHT IS 46" MAX AT THE TOP OF THE CONTROL. THE OBSTRUCTION SHOULD NOT BE MORE THAN 24" DEEP AND 34" HIGH. IF IN CONFLICT WITH BASE CABINET, RELOCATE THERMOSTAT/TEMPERATURE SENSOR TO ANOTHER APPROVED LOCATION.</p> <p>15. PROVIDE FIRE/SMOKE DAMPERS AT ALL PENETRATIONS THROUGH FIRE RATED WALLS/FLOORS AS REQUIRED BY, AND TO COMPLY WITH CBC SECTION 713.10. DAMPERS SHALL BE INSTALLED STRICTLY PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. ALL FIRE/SMOKE DAMPERS SHALL BE INCREASED IN SIZE BY 2" IN BOTH LENGTH AND WIDTH OF DUCT SIZE.</p> <p>16. PENETRATION OF FIRE ASSEMBLIES BY PIPES, DUCTS, CONDUITS SHALL BE FIRESTOPPED USING A MATERIAL APPROVED BY THE STATE FIRE MARSHAL AND SHALL HAVE AN F OR T RATING AS DETERMINED BY TESTS CONDUCTED IN ACCORDANCE WITH CBC STANDARD NO 7-5. (T= TEMPERATURE; F= FIRE RESISTANCE).</p> <p>17. MECHANICAL EQUIPMENT SHALL BE ACCESSIBLE. COORDINATE WITH ALL TRADES.</p> <p>18. INSTALL VOLUME DAMPERS ON ALL BRANCH DUCTS TO DIFFUSERS/REGISTERS.</p> <p>19. PROVIDE TURNING VANES IN ALL 90° DUCT TURNS.</p> <p>20. PROVIDE MANUAL RELIEF VENT AT ALL HIGH POINTS AND HOSE-END BALL VALVE AT ALL LOW POINTS OF PIPING.</p> <p>21. INSULATION APPLIED TO THE EXTERIOR SURFACE OF DUCTS LOCATED IN BUILDINGS SHALL HAVE A FLAME-SPREAD OF NOT MORE THAN 25 AND A SMOKE-DEVELOPED RATING OF NOT MORE THAN 50 WHEN TESTED AS A COMPOSITE INSTALLATION INCLUDING INSULATION, FACING MATERIALS, TAPES AND ADHESIVES AS NORMALLY APPLIED. (CMC SECTION 605).</p> <p>22. BALL VALVES SHALL BE INSTALLED SO THAT WHEN THE HANDLE IS IN AN OPEN POSITION, THE HANDLE IS ON THE SIDE THAT THE SERVICE IS FROM.</p>		<p>1. ANY HVAC EQUIPMENT FOR WHICH THERE IS A CALIFORNIA STANDARD ESTABLISHED IN THE APPLIANCE EFFICIENCY REGULATIONS SHALL COMPLY WITH THE APPLICABLE STANDARDS.</p> <p>2. CONTRACTOR SHALL INSTALL PER PLAN & SPECIFICATIONS. SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO INSTALLATION. CONTRACTOR SHALL VERIFY THE EXACT CEILING SPACE AND INTERCHANGE THE DUCT SIZE TO FIT THE CEILING SPACE WITHOUT ADDITIONAL COST TO THE OWNER.</p> <p>3. CONNECT MAIN DUCTS TO AIR CONDITIONING UNITS WITH WEATHERPROOF FLEXIBLE CONNECTIONS. SUN SHIELDS OVER ENTIRE FLEXIBLE CONNECTIONS ARE REQUIRED IF FLEXIBLE CONNECTIONS ARE EXPOSED TO WEATHER.</p> <p>4. PROVIDE FILTERS FOR AIR CONDITIONING AND/OR AIR SIDE UNITS AS REQUIRED PER SPECIFICATIONS.</p> <p>5. THE CONTRACTOR SHALL PROVIDE ALL OUTSIDE AIR INTAKES AND EXHAUST AIR OUTLETS WITH HOODS, 1/2" GALVANIZED MESH SCREENS, AND AUTOMATIC BACK DRAFT DAMPERS OR MOTORIZED DAMPERS.</p> <p>6. EXHAUST TERMINATION SHALL BE MINIMUM 10'-0" AWAY FROM, OR 3'-0" ABOVE, ANY OUTSIDE AIR INTAKE, OPERABLE WINDOWS, AND DOORS. THEY SHALL ALSO BE 10'-0" MINIMUM ABOVE GRADE.</p> <p>7. INSTALL A VOLUME CONTROL DAMPER AT EACH SUPPLY AIR DIFFUSER TO AFFORD COMPLETE CONTROL OF THE AIR FLOW IN THE VARIOUS DUCT SYSTEMS. INSTALL A SPLITTER DAMPER AT EACH DUCT TAKE-OFF AND DAMPER IF REQUIRED.</p> <p>8. THE CONTRACTOR SHALL FURNISH AND INSTALL ACCESS DOORS AND/OR ACCESS PANELS AT LOCATIONS AS NECESSARY TO SERVICE FIRE DAMPERS, AND COMBINATION FIRE/SMOKE DAMPERS, AND TO PROVIDE MAINTENANCE FOR EQUIPMENT. ALL ACCESS DOORS AND PANEL LOCATIONS SHALL BE VERIFIED WITH THE ARCHITECT PRIOR TO INSTALLATION.</p> <p>9. ALL SUPPLY/RETURN DUCTWORK AND SOUND ATTENUATORS (SILENCERS) EXPOSED TO WEATHER SHALL BE EXTERNALLY INSULATED AND WRAPPED WITH METAL JACKET.</p> <p>10. THE CONTRACTOR SHALL PROVIDE FIRE DAMPERS, SMOKE DAMPERS, FIRE/SMOKE DAMPERS AT ALL PENETRATIONS OF FIRE WALLS, SMOKE WALLS OR CEILING ASSEMBLIES WHETHER OR NOT SHOWN ON THE DRAWINGS. WHERE CLARIFICATION IS REQUIRED, QUESTIONS MUST BE SUBMITTED TO THE ARCHITECT PRIOR TO BIDDING.</p> <p>11. THE FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED.</p> <p>12. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF CEILING DIFFUSERS, REGISTERS, AND GRILLES.</p> <p>13. THE CONTRACTOR SHALL PRESSURE TEST/LEAK TEST ALL EXISTING SUPPLY AND RETURN DUCTS AND REPORT THE FINDINGS TO THE OWNER'S REPRESENTATIVE.</p> <p>14. ALL SUPPORT AND BRACING OF DUCTS AND PIPING SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA GUIDELINES. WHERE BRACING DETAILS ARE NOT SHOWN ON THE DRAWINGS OR IN THE GUIDELINES, THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT, OR MECHANICAL ENGINEER. A COPY OF THE GUIDELINES PUBLISHED BY SMACNA SHALL BE PROVIDED BY THE CONTRACTOR AND KEPT ON THE JOB AT ALL TIMES.</p> <p>15. IF THE NEW HVAC SYSTEM IS USED DURING CONSTRUCTION, USE RETURN AIR FILTER WITH A MERV OF 8. REPLACE ALL FILTERS IMMEDIATELY PRIOR TO OCCUPANCY.</p> <p>16. ALL DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC, OR SHEET METAL UNTIL THE FINAL STARTUP OF THE HEATING, COOLING AND VENTILATING EQUIPMENT.</p> <p>17. THE HVAC, REFRIGERATION, AND FIRE SUPPRESSION EQUIPMENT SHALL NOT CONTAIN CFC OR HALONS.</p> <p>18. DUCT CLEANING: CONTRACTOR SHALL CLEAN THE INTERIOR OF ALL EXISTING SUPPLY AND RETURN DUCTS CONNECTED TO THE NEW HVAC EQUIPMENT.</p> <p>19. PROVIDE TESTING, ADJUSTING, AND BALANCING OF THE ENTIRE AIR HANDLING SYSTEMS AND CONTROLS OF RTU-1, EF-1, AND EF-2, IN ACCORDANCE WITH THE LATEST EDITION OF THE ASHRAE NATIONAL STANDARDS.</p>	<p>2016 BUILDING STANDARDS ADMINISTRATIVE CODE, PART 1, TITLE 24 C.C.R.</p> <p>2016 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R.</p> <p>(2012 INTERNATIONAL BUILDING CODE VOLUMES 1-3 AND 2010 CALIFORNIA AMENDMENTS)</p> <p>2016 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 C.C.R.</p> <p>(2012 NATIONAL ELECTRICAL CODE AND 2010 CALIFORNIA AMENDMENTS)</p> <p>2016 CALIFORNIA MECHANICAL CODE (CMC) PART 4, TITLE 24 C.C.R.</p> <p>(2012 INTERNATIONAL MECHANICAL CODE AND 2010 CALIFORNIA AMENDMENTS)</p> <p>2016 CALIFORNIA PLUMBING CODE (CPO), PART 5, TITLE 24 C.C.R.</p> <p>(2012 INTERNATIONAL PLUMBING CODE AND 2010 CALIFORNIA AMENDMENTS)</p> <p>2016 CALIFORNIA ENERGY CODE, PART 6, TITLE 24 C.C.R.</p> <p>2016 CALIFORNIA ELEVATOR CODE, PART 7, TITLE 24 C.C.R.</p> <p>2016 CALIFORNIA FIRE CODE PART 9, TITLE 24 C.C.R.</p> <p>(2012 INTERNATIONAL FIRE CODE AND 2007 CALIFORNIA AMENDMENTS)</p> <p>2016 CALIFORNIA REFERENCED STANDARDS, PART 12, TITLE 24 C.C.R.</p> <p>TITLE 19 C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.</p> <p>PARTIAL LIST OF APPLICABLE STANDARDS</p> <p>NFPA 13 AUTOMATIC SPRINKLER SYSTEMS 2016 EDITION</p> <p>NFPA 14 STANDPIPE SYSTEMS 2016 EDITION</p> <p>NFPA 17 DRY CHEMICAL EXTINGUISHING SYSTEMS 2006 EDITION</p> <p>NFPA 17A WET CHEMICAL SYSTEMS 2016 EDITION</p> <p>NFPA 20 STATIONARY PUMPS 2016 EDITION</p> <p>NFPA 24 PRIVATE FIRE MAINS 2016 EDITION</p> <p>NFPA 72 NATIONAL FIRE ALARM CODE (CALIFORNIA AMENDED) (NOTE SEE UL STANDARD 1971 FOR "VISUAL DEVICES") 2016 EDITION</p> <p>NFPA 80 FIRE DOOR AND OTHER OPENINGS PROTECTIVES 2016 EDITION</p> <p>NFPA 253 CRITICAL RADIANT FLUX OF FLOOR COVERING SYSTEMS 2016 EDITION</p> <p>NFPA 2001 CLEAN AGENT FIRE EXTINGUISHING SYSTEMS 2016 EDITION</p> <p>REFERENCE CODE SECTION FOR NFPA STANDARDS 2016 CBC (SFM) CHAPTER 35</p>	<p>DRAWING SHEET TITLE</p> <p>M-1.00 MECHANICAL NOTES, LEGENDS, ABBREVIATIONS, AND SHEET INDEX</p> <p>M-1.10 MECHANICAL SCHEDULES</p> <p>M-1.20 MECHANICAL TITLE 24 – NRCC FORMS</p> <p>M-1.30 MECHANICAL TITLE 24 – NRCC FORMS</p> <p>M-2.00 MECHANICAL PARTIAL FIRST FLOOR PLAN</p> <p>M-2.10 MECHANICAL PARTIAL SECOND FLOOR PLAN</p> <p>M-2.20 MECHANICAL ROOF PLAN</p> <p>M-3.00 MECHANICAL ENLARGED PLANS & SECTIONS</p> <p>M-4.00 MECHANICAL CONTROLS</p> <p>M-4.01 MECHANICAL CONTROLS</p> <p>M-5.00 MECHANICAL DETAILS</p>	



PROJECT TITLE AND LOCATION

**BRENDA VILLA
AQUATIC CENTER
HVAC UPGRADES**

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COMMERCE, CA 90040



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TEL: (213) 873-4700
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STAMPS/SEALS



APPROVAL

REVISION	DESCRIPTION	DATE
	100% CDs	10/02/18

SHEET TITLE:

**MECHANICAL
NOTES, LEGENDS,
ABBREVIATIONS,
AND SHEET INDEX**

HSA PROJECT NO: 0817.2117.01

PROJECT ARCH: R.H.

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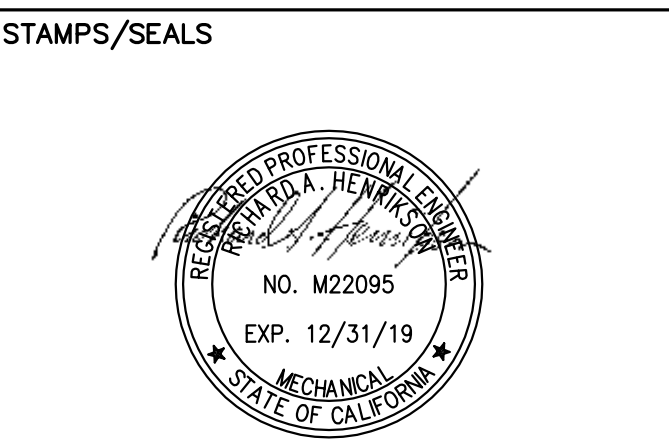
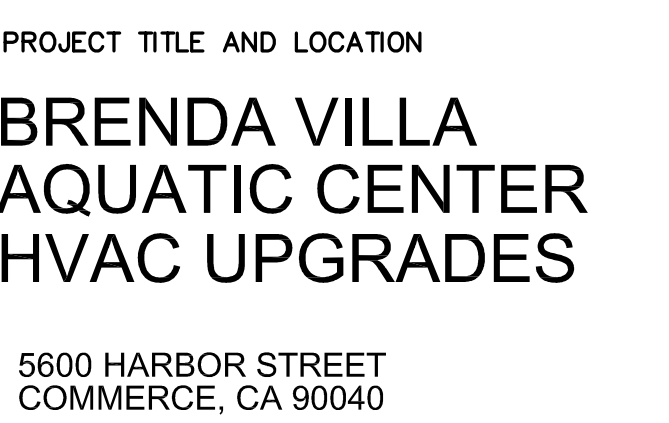
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

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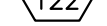
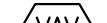
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




SHEET TITLE:	
MECHANICAL SCHEDULES	
HWA PROJECT NO: 0817.2117.01	PROJECT ARCH: R.H.
DRAWN:	CHECKED: R.H.
SHEET NUMBER	
M-1.10	
DATE:	SHEET: OF:

NEW EXHAUST FAN SCHEDULE													
SYM	MANUF./ MODEL	LOCATION	AREA SERVED	TYPE	CFM	STATIC PRESSURE W.G.	RPM	DRIVE	MOTOR			OPER. WT. LBS.	REMARKS
									HP	WATT	VOLT		
	COOK/ ACW-D-120W175	ROOF	POOL AREA	WALL MOUNTED	1500	0.5	1725	DIRECT	1/3	—	115/1/60	71	1,2,3,4
	COOK/ ACW-D-120W175	ROOF	POOL AREA	WALL MOUNTED	1500	0.5	1725	DIRECT	1/3	—	115/1/60	71	1,2,3,4
REMARKS: 1. INVERTER RATED MOTOR. 2. BACK DRAFT DAMPER. 3. PHENOLIC EPOXY POWDER COATING ON ALL SURFACES IN CONTACT WITH AIRSTREAM. 4. CONNECT THE EXHAUST FANS TO THE EMS.													

EXISTING FAN COIL SCHEDULE																													
MARK	MANUF./ MODEL	LOCATION	TYPE	SERVICE	SUPPLY FAN				SF MOTOR			HEATING COIL											FILTERS			MIN OSA	OPERATION WEIGHT	REMARKS	
					AIRFLOW	ESP IN. W.C.	RPM	BHP	HP	V/PH	RPM	MPH	QTY	FACE AREA SQ.FT.	ROW/FPI	FACE VEL FPM	AIR			WATER				SIZE	EFF.				TYPE
																	EAT DB (°F)	LAT DB (°F)	P.D. (IN. W.C.)	GPM	ENT (°F)	LWT (°F)	P.D. (FT)						
FC-1	ENVIRO TEC HPP-20	CEILING-MEN'S LOCKER ROOM	4-PIPE FAN COIL	HV MAKE UP AIR	1440	0.60	-	-	(2)1/3	115/1	-	68	1	5.0	2/-	272	32	78	-	3.0	180	140	-	-	30	DISPOSABLE	1440	400	
FC-2	ENVIRO TEC HPP-20	CEILING-WOMEN'S LOCKER ROOM	4-PIPE FAN COIL	HV MAKE UP AIR	1440	0.60	-	-	(2)1/3	115/1	-	68	1	5.0	2/-	272	32	78	-	3.0	180	140	-	-	30	DISPOSABLE	1440	400	

VARIABLE AIR VOLUME, TERMINAL REHEAT, AIR TERMINAL UNIT SCHEDULE																			
UNIT NUMBER	MANUFACTURER AND MODEL NO. (OR EQUAL)	LOCATION/ SERVICE	INLET DUCT SIZE (IN.)	MAXIMUM COOLING AIRFLOW (CFM)	MINIMUM AIRFLOW (CFM)	MAXIMUM HEATING AIRFLOW (CFM)	DISCHARGE PLENUM LENGTH (FT.)	MAX TOTAL VAV P.D. (IN. WG.)	TWO ROW REHEAT COIL DETAIL						UNIT DIMENSIONS (LxWxH IN INCHES)	WEIGHT (LBS)	REMARKS		
									HTG. MBH	AIR TEMP(°F)		WATER TEMP(°F)		MAX WATER PD (FT HD)				GPM	PIPE DIA (IN)
									ENT	LVG	ENT	LVG							
	TITUS DESV	ROOF/ SPECTATOR	16"ø	3000	900	1770	SEE PLAN	0.4"	67.0	55	90	180	150	0.4	4.5	1 1/4	15 1/2 x 24 x 18	60	1
	TITUS DESV	2ND FLOOR SPECTATOR	14"ø	2000	500	1400	SEE PLAN	0.4"	52.0	55	90	180	150	0.4	3.3	1	15 1/2 x 20 x17 1/2	56	
REMARKS: 1. PROVIDE CONTROLS AND ELECTRONICS IN NEMA 3R WEATHER PROOF ENCLOSURE. PROVIDE BELIMO ACTUATOR AT VAV WITH NEMA 3R WEATHER PROOF ENCLOSURE.																			

DIFFUSER SCHEDULE							
MARK	AIR FLOW CFM	MFR	MODEL	NECK SIZE	PANEL SIZE OR OD	NC	REMARKS
SIDEWALL SUPPLY GRILLE							
	301-500	KRUEGER	9880	AS NOTED	AS NOTED	-	1
SIDEWALL RETURN GRILLE							
	1000	KRUEGER	S80	AS NOTED	24x10	-	1
	1500	KRUEGER	S80	AS NOTED	30x12	-	1
1. STAINLESS STEEL							



PROJECT TITLE AND LOCATION

BRENDA VILLA
AQUATIC CENTER
HVAC UPGRADES5600 HARBOR STREET
COMMERCE, CA 90040811 WILSHIRE BLVD., SUITE 1050
LOS ANGELES, CA 90017
TEL: (213) 873-4700
FAX: (213) 873-4790
www.owengroup.com

STAMPS/SEALS



APPROVAL

REVISION	DESCRIPTION	DATE
	100% CDs	10/02/18

SHEET TITLE:

MECHANICAL
TITLE 24-NRCC
FORMS

HVA PROJECT NO.: 0817.2117.01 PROJECT ARCH: R.H.

DRAWN: CHECKED: R.H.

SHEET NUMBER

M-1.20

DATE: SHEET: OF:

STATE OF CALIFORNIA
MECHANICAL SYSTEMS
CSC-NRCC-MCH-01-E (Revised 01/16)
CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE
NRCC-MCH-01-E
(Page 1 of 4)
Project Name: Brenda Villa Aquatics Center-Spectator Viewing Area Date Prepared: 6/25/2018

A. MECHANICAL COMPLIANCE DOCUMENTS & WORKSHEETS (check box if worksheet is included)
For detailed instructions on the use of this and all Energy Efficiency Standards compliance forms, refer to the 2016 Nonresidential Manual
Note: The Enforcement Agency may require all forms to be incorporated onto the building plans.

YES	NO	Comp. Doc. Worksheet #	Title
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCC-MCH-01-E (Part 1 of 3)	Certificate of Compliance, Declaration, Required on plans for all submittals.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCC-MCH-01-E (Part 2 of 3)	Certificate of Compliance, Required Acceptance Tests (MCH-02-A to 11-A), Required on plans for all submittals.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCC-MCH-01-E (Part 3 of 3)	Certificate of Compliance, Required Acceptance Tests (MCH-12-A to 18-A), Required on plans where applicable.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCC-MCH-02-E (Part 1 of 2)	Mechanical Dry Equipment Summary is required for all submittals with Central Air Systems. It is optional on plans.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCC-MCH-02-E (Part 2 of 2)	Mechanical Wet Equipment Summary is required for all submittals with chilled water, hot water or condenser water systems. It is optional on plans.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCC-MCH-03-E	Mechanical Ventilation and Reheat is required for all submittals with multiple zone heating and cooling systems. It is optional on plans.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCC-MCH-07-E (Part 1 of 2)	Power Consumption of Fans, Required on plans where applicable
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCC-MCH-07-E (Part 2 of 2)	Power Consumption of Fans, Declaration, Required on plans where applicable

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance January 2016

STATE OF CALIFORNIA
MECHANICAL SYSTEMS
CSC-NRCC-MCH-01-E (Revised 01/16)
CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE
NRCC-MCH-01-E
(Page 2 of 4)
Project Name: Brenda Villa Aquatics Center-Spectator Viewing Area Date Prepared: 6/25/2018

B. MECHANICAL HVAC ACCEPTANCE FORMS (check box for required compliance documents)




Test Performed By:


Designer:
This compliance document is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for HVAC systems. The designer is required to check the applicable boxes for all acceptance tests that apply and list all equipment that requires an acceptance test. All equipment of the same type that requires a test, list the equipment description and the number of systems.

Installing Contractor:
The contractor who installed the equipment is responsible to either conduct the acceptance test themselves or have a qualified entity run the test for them. If more than one person has responsibility for the acceptance testing, each person shall sign and submit the Certificate of Acceptance applicable to the portion of the construction or installation for which they are responsible.

Enforcement Agency:
Flancheck - The NRCC-MCH-01-E compliance document is not considered a completed document and is not to be accepted by the building department unless the correct boxes are checked.
Inspector - Before occupancy permit is granted all newly installed process systems must be tested to ensure proper operation.

Test Description	MCH-02-A	MCH-03-A	MCH-04-A	MCH-05-A	MCH-06-A	MCH-07-A	MCH-08-A	MCH-09-A	MCH-10-A	MCH-11-A
Equipment Requiring Testing or Verification	# of Units	Outdoor Air Single Zone Unitary	Air Distribution Ducts	Economizer Controls	Demand Control Ventilation (DCV)	Supply Fan VAV	Valve Leakage Test	Supply Water Temp. Reset	Hydronic System Variable Flow Control	Automatic Demand Shed Control
Daikin-RPS0681	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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STATE OF CALIFORNIA REQUIRED ACCEPTANCE TESTS <small>2015-MBEC-MCH-04 is adopted 8/1/16</small>		 CALIFORNIA ENERGY COMMISSION NRCC-MCH-04-E
CERTIFICATE OF COMPLIANCE Required Acceptance Tests		
Project Name: Brenda Villa Aquatics Center-Spectator Viewing Area		Date Prepared: 6/25/2018 (Page 3 of 3)
DOCUMENTATION AUTHOR'S DECLARATION STATEMENT		
I, Richard Henrickson , certify that this Certificate of Compliance documentation is accurate and complete.		
Documentation Author Name Khoa Ho	Documentation Author Signature 	Signature Date 6/25/2018
Company Henrickson Owen & Associates	CEAF HERS Certification Identification (if applicable):	
Address 220 Technology Drive, Suite 100	Phone: 949-860-4900	
City/State/Zip Irvine, CA 92618		
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 Richard Henrickson	Responsible Designer Signature 	
Company Henrickson Owen	Date Signed 5/31/2018	License M22095
Address 220 Technology Drive, Suite 100	Phone (949)860-4800	
City/State/Zip Irvine, CA 92618		



CALIFORNIA ENERGY COMMISSION

NRCC-MCH-04-E
(Page 3 of 3)

STATE OF CALIFORNIA
FAN POWER COMPUTATION
CEC-NRCC-MCH-07-E (Revised 6/1/16)



CALIFORNIA ENERGY COMMISSION

NRCC-MCH-07-E
(Page 1 of 2)

Power Consumption of Fans Requirements

Project Name: **Brenda Villa Aquatics Center-Spectator Viewing Area**

Date Prepared: **6/25/2018**

A. Constant Volume Fan Systems

NOTE: Provide one copy of this worksheet for each fan system with a total fan system horsepower greater than 25 hp of Constant Volume Fan Systems when using the Prescriptive Approach. See Power Consumption of Fans §140.4(c).

FAN DESCRIPTION	DESIGN BRAKE HP	03 EFFICIENCY		04 NUMBER OF FANS	05 PEAK WATTS A02 x A04 x 746 / (A03a x A03b)
		MOTOR	DRIVE		
RTU-1 - Supply Fan	20,000	93.6 %	97.0 %	1.2	15,433
Return Fan	7,500	91.7 %	97.0 %	1.2	6,290

B. Variable Air Volume Fan Systems

NOTE: Provide one copy of this worksheet for each fan system with a total fan system horsepower greater than 25 hp of Variable Air Volume (VAV) Systems when using the Prescriptive Approach. See Power Consumption of Fans §140.4(c).

FAN DESCRIPTION	DESIGN BRAKE HP	03 EFFICIENCY		04 NUMBER OF FANS	05 PEAK WATTS B02 x B04 x 746 / (B03a x B03b)
		MOTOR	DRIVE		

C. Totals and Adjustments

01	02	03	04	05
<p>01 TOTAL FAN SYSTEM POWER (WATTS, SUM COLUMN F)</p> <p>22,723</p>	<p>02 SUPPLY DESIGN AIRFLOW</p> <p>21,000 CFM</p>	<p>03 TOTAL FAN SYSTEM POWER INDEX (Row 1 / Row 2)¹</p> <p>1.082</p>	<p>04 SP_a</p> <p>in W/C or Pa</p>	<p>05 SP_i</p> <p>in W/C or Pa</p>
<p>06 Fan Adjustment = 1-SP_a - 1/SP_i</p>	<p>07 ADJUSTED FAN POWER INDEX (Line 3 x Line 6)²</p> <p>1.882</p>	<p>W/GFM</p>	<p>W/GFM</p>	<p>W/GFM</p>

1. TOTAL FAN SYSTEM POWER INDEX or ADJUSTED FAN POWER INDEX must not exceed 0.8 W/cfm for Constant Volume systems or 1.25 W/cfm for VAV systems.

January 2016

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance

January 2016

STATE OF CALIFORNIA AN POWER CONSUMPTION CERIFICATE OF COMPLIANCE		CALIFORNIA ENERGY COMMISSION RRCC-MCH-37-E (Page 2 of 2)	
Power Consumption of Fans Requirements			
Project Name Brenda Villa Aquatics Center-Spectator Viewing Area		Date Issued 6/25/2018	
DOCUMENTATION AUTHOR'S DECLARATION STATEMENT			
I certify that this Certificate of Compliance documentation is accurate and complete.			
Documentation Author Name Rhonda Ho		Documentation Author Signature [Signature]	
Company Hennrikson Owen & Associates		Signature Date 6/25/2018	
Address 220 Technology Drive, Suite 100		CA/EIRB Certification Identification (if applicable)	
City/State/Zip Irvine, CA 92618		Phone 949-860-4900	
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.			
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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 Richard Hennrikson		Responsible Designer Signature [Signature]	
Company Hennrikson Owen		Date Signed 6/25/2018	
Address 220 Technology Drive, Suite 100		Licence M22095	
City/State/Zip Irvine, CA 92618		Phone (949)860-4800	

A Building Energy Efficiency Standards - 2016 Nonresidential Compliance

January 2016

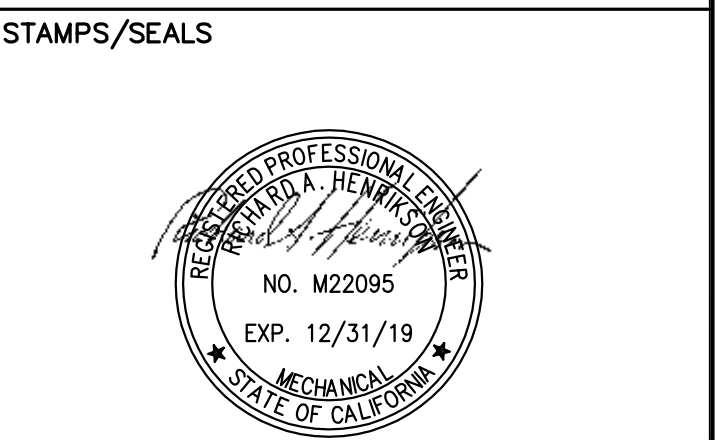
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DRAWN:		CHECKED: R.H.	
SHEET NUMBER			
M-1.30			
DATE:		SHEET: OF:	



PROJECT TITLE AND LOCATION
**BRENDA VILLA
AQUATIC CENTER
HVAC UPGRADES**
5600 HARBOR STREET
COMMERCE, CA 90040

OWEN
811 WILSHIRE BLVD., SUITE 1050
LOS ANGELES, CA 90017
TEL: (213) 873-4700
FAX: (213) 873-4790
www.owengroup.com



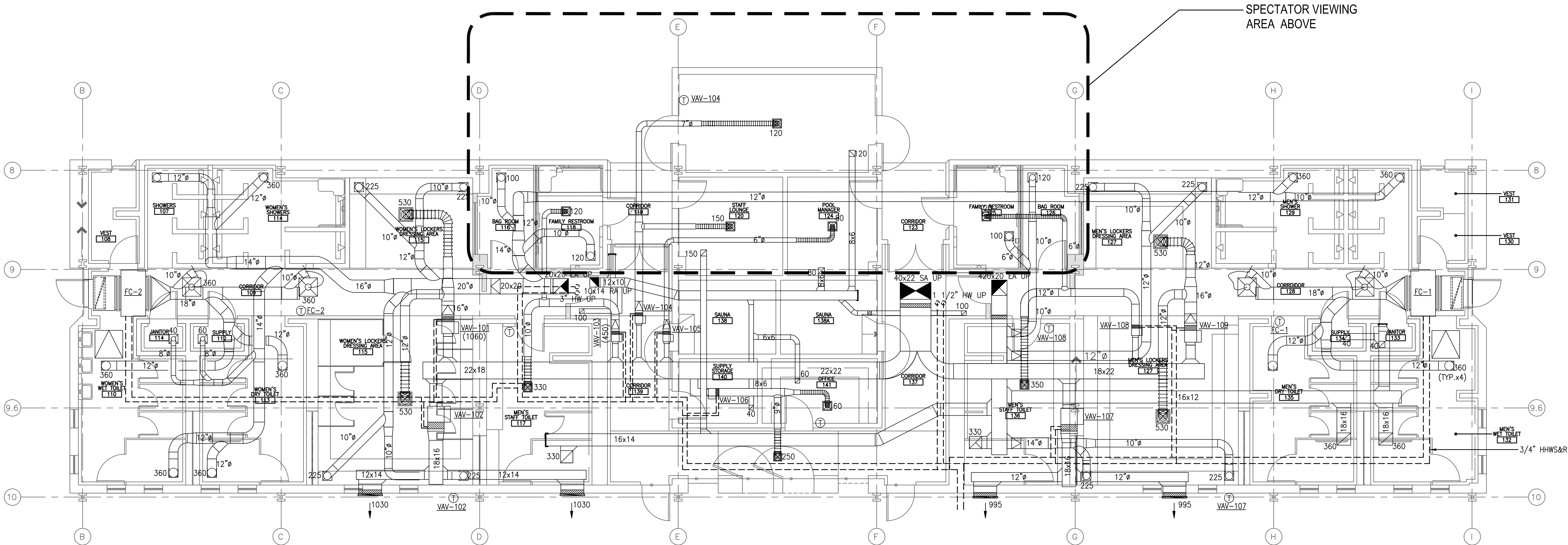
APPROVAL

REVISION	DESCRIPTION	DATE
	100% CDs	10/02/18

SHEET TITLE:
**MECHANICAL
PARTIAL FIRST
FLOOR PLAN**

HVA PROJECT NO.: 0817.2117.01	PROJECT ARCH: R.H.
DRAWN:	CHECKED: R.H.
SHEET NUMBER	
DATE:	SHEET: OF:

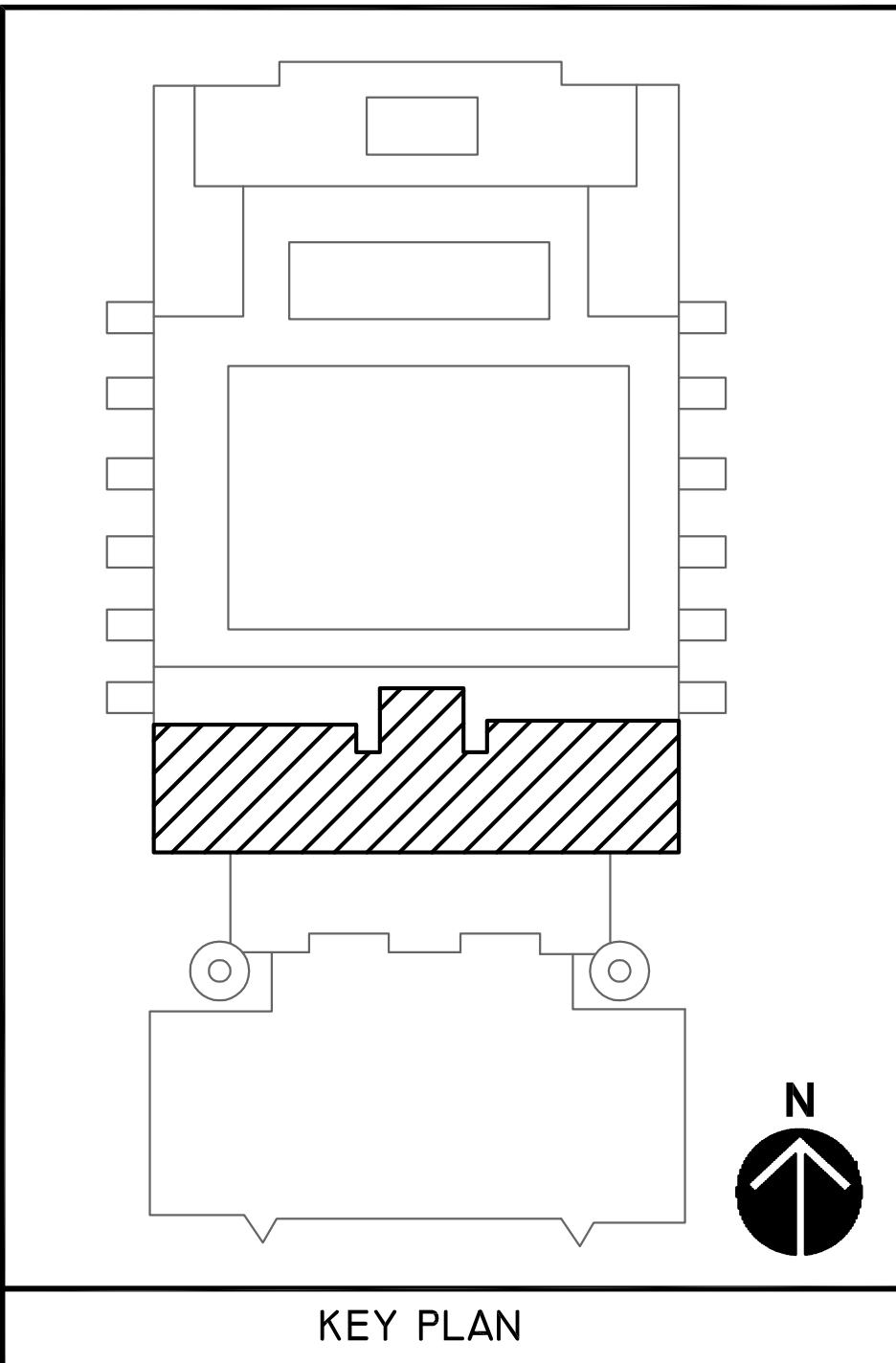
M-2.00



1 MECHANICAL PARTIAL FIRST FLOOR PLAN
SCALE: 3/16" = 1'-0"

GENERAL NOTES:

1. THIS SHEET SHOWN FOR REFERENCE ONLY TO PERFORM AIR BALANCE AND COMMISSIONING OF NEW RTU-1 SYSTEM.





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STAMPS/SEALS



APPROVAL

REVISION	DESCRIPTION	DATE
	100% CDs	10/02/18

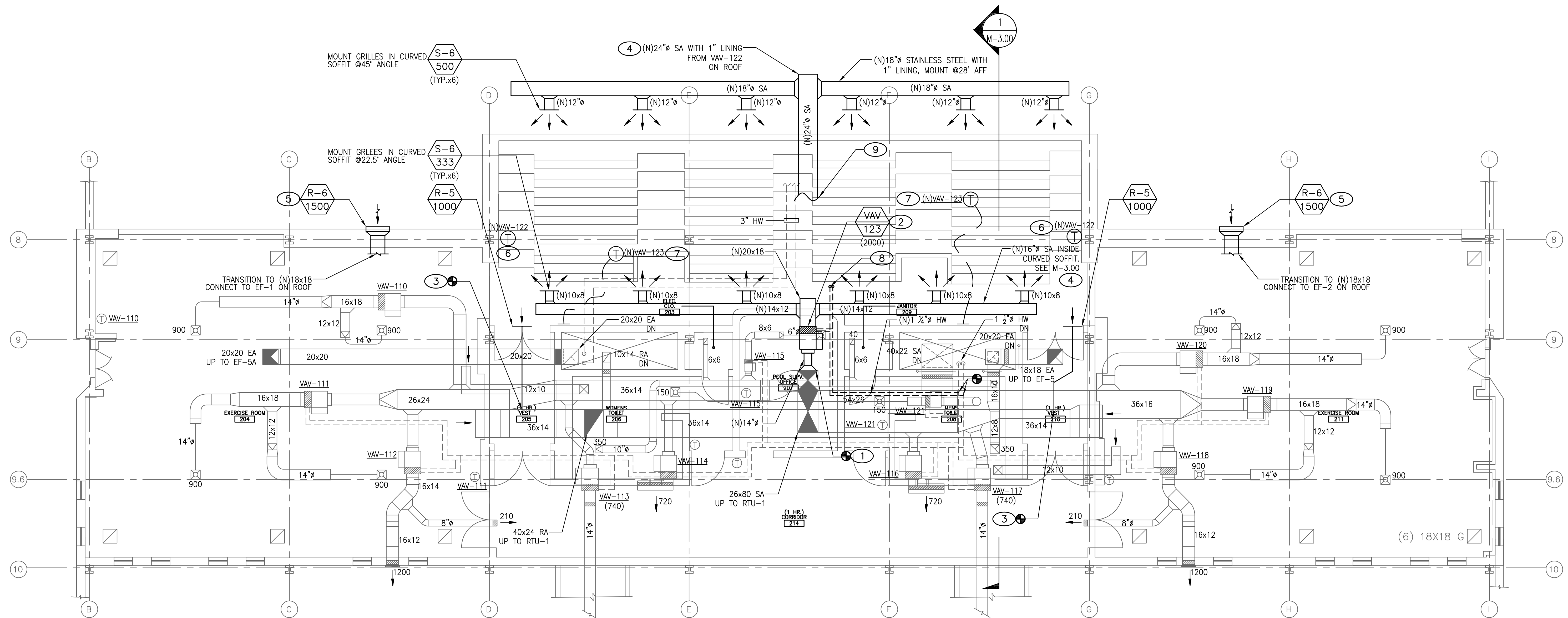
SHEET TITLE:

**MECHANICAL
PARTIAL SECOND
FLOOR PLAN**

HVA PROJECT NO.: 0817.2117.01 PROJECT ARCH: R.H.
DRAWN: CHECKED: R.H.
SHEET NUMBER

M-2.10

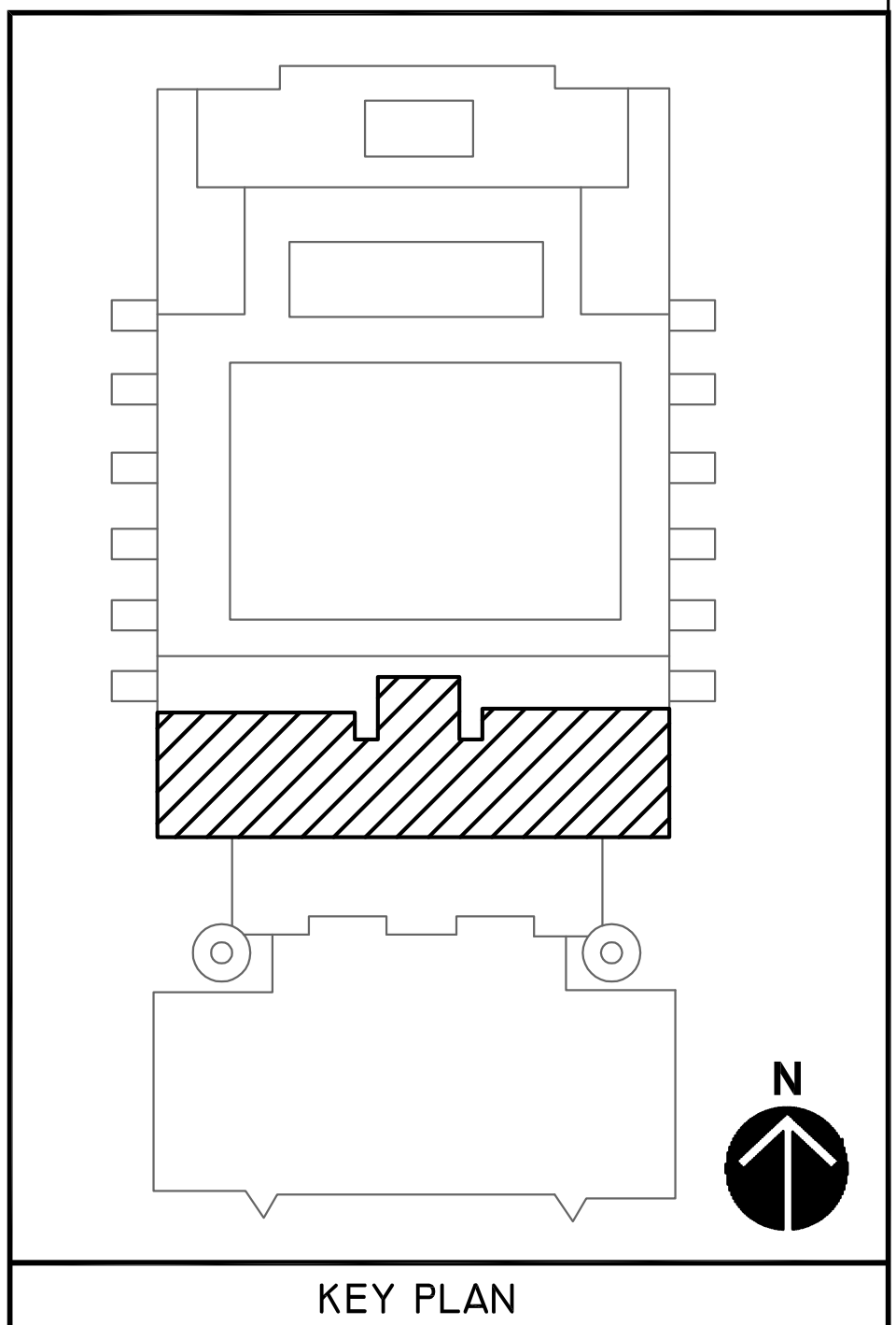
DATE: SHEET: OF:



1 MECHANICAL PARTIAL SECOND FLOOR PLAN
SCALE: 3/16" = 1'-0"

NEW CONSTRUCTION KEY NOTES:

- CONNECT (N)14" SA TO (E)80x26 DISCHARGE PLENUM.
- INSTALL (N)VAV-123 ABOVE CEILING IN POOL SUPERVISOR OFFICE-207. COORDINATE EXACT LOCATION WITH EXISTING SYSTEM.
- CONNECT (N)18x10 RA TO (E)34x14 RA.
- ALL DUCTS, DIFFUSERS, AND ACCESSORIES EXPOSED TO POOL AREA SHALL BE STAINLESS STEEL WITH 1" LINING.
- MOUNT GRILLE HIGH ON WALL AT +/- 42'-0" AFF.
- MOUNT VAV-122 TEMPERATURE SENSOR ON WALL BELOW GLASS AT 42" AFF.
- MOUNT VAV-123 TEMPERATURE SENSOR ON BACK WALL AT 48" AFF.
- 1 1/4" HHWS&R ROUTE THROUGH NEW WALL PENETRATION, UP TO ROOF TO SERVE NEW VAV-122. SEE M-3.00 FOR MORE PIPE ROUTING DETAIL.
- NEW 24" SA DUCT. SEE SHEET M-2.20 FOR CONTINUATION.





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STAMPS/SEALS



APPROVAL

REVISION	DESCRIPTION	DATE
	100% CDs	10/02/18

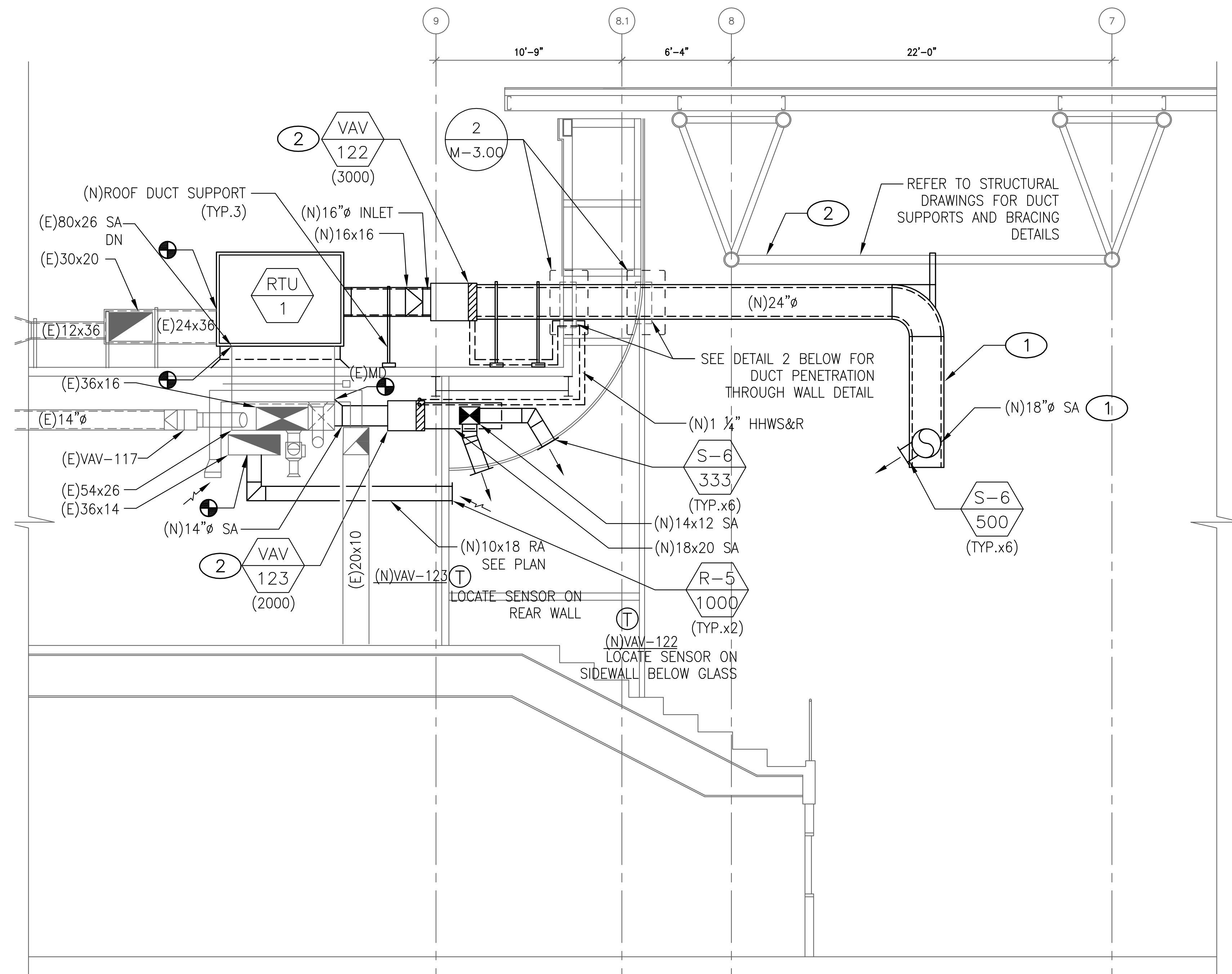
SHEET TITLE:

**MECHANICAL
ENLARGED PLANS &
SECTIONS**

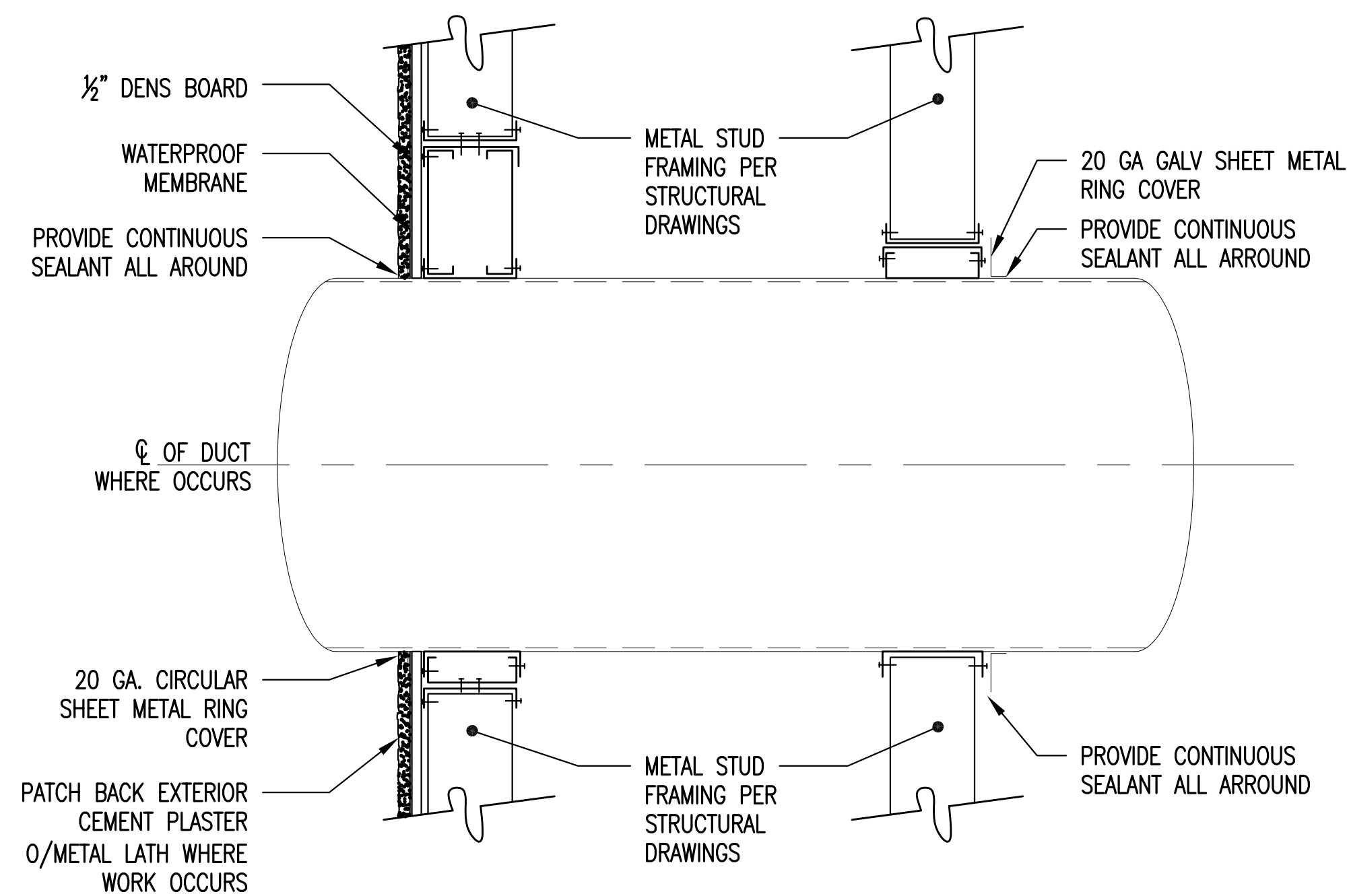
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DRAWN: CHECKED: R.H.
SHEET NUMBER

M-3.00

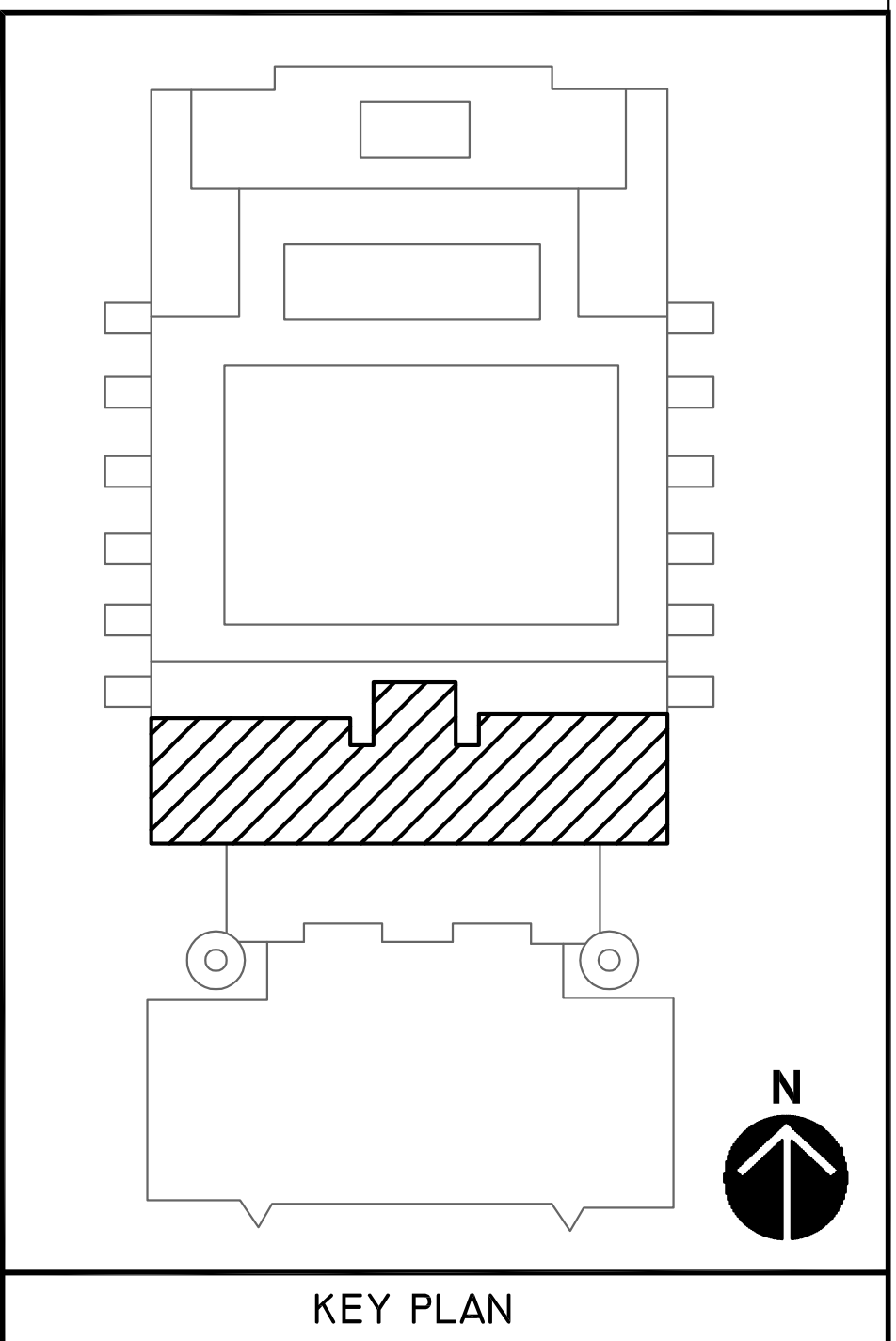
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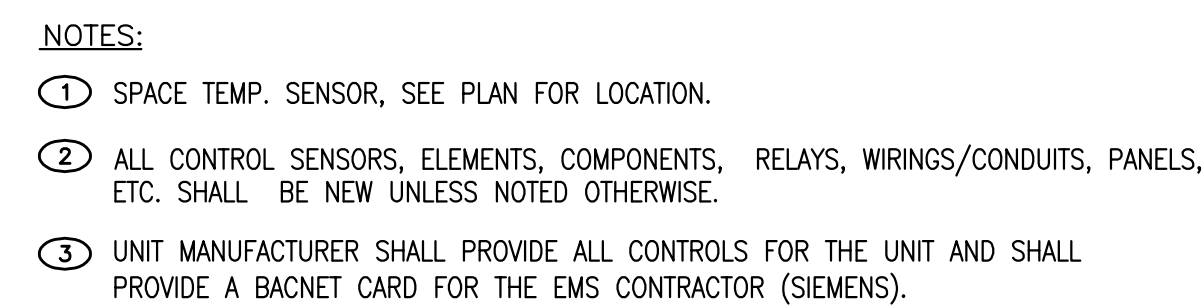
1 MECHANICAL ENLARGED SECTION
SCALE: 1/4" = 1'-0"



2 DUCT SECTION
SCALE: 1" = 1'-0"



- NEW CONSTRUCTION KEY NOTES:**
- 1 ALL EXPOSED DUCTS IN POOL AREA SHALL BE STAINLESS STEEL WITH 1" LINING.
 - 2 REFER TO STRUCTURAL DRAWINGS FOR SUPPORT AND BRACING DETAILS.

[illegible]

A. OCCUPIED:

1. WHEN ZONE TEMPERATURE IS GREATER THAN ITS COOLING SETPOINT, THE ZONE DAMPER SHALL MODULATE BETWEEN THE MINIMUM OCCUPIED AIR FLOW (ADU) AND THE MAXIMUM COOLING AIR FLOW (ADU) UNTIL THE ZONE IS SATISFIED.
2. WHEN THE ZONE TEMPERATURE IS BETWEEN THE COOLING SETPOINT AND THE HEATING SETPOINT, THE ZONE DAMPER WILL MAINTAIN THE MINIMUM REQUIRED ZONE VENTILATION (ADU).
3. WHEN ZONE TEMPERATURE IS LESS THAN ITS HEATING SETPOINT, THE CONTROLLER SHALL ENABLE HEATING TO MAINTAIN THE ZONE TEMPERATURE AT ITS HEATING SETPOINT. SPECIFICALLY, IT WILL FIRST MODULATE OPEN THE HEATING HOT WATER (HHW) CONTROL VALVE TO ALLOW HHW TO CIRCULATE THROUGH THE REHEAT COIL TO HEAT THE MINIMUM REQUIRED ZONE VENTILATION (ADU) SUPPLY AIR AND THEREBY MAINTAIN ITS HEATING SETPOINT. IT WILL HEAT THE MINIMUM REQUIRED ZONE VENTILATION (ADU) SUPPLY AIR UP TO 90°F AS THE FIRST STAGE OF HEATING. IF MORE HEAT IS REQUIRED, THE DAMPER WILL MODULATE TO INCREASE THE AIR FLOW RATE UP TO "HEATING" MAXIMUM AIR FLOW SETPOINT.

B. UNOCCUPIED:

1. WHEN THE ZONE IS UNOCCUPIED, THE ZONE DAMPER WILL CONTROL TO ITS MINIMUM UNOCCUPIED AIR FLOW (ADU) (WHICH, IN NON-LAB SPACES, WILL BE 0 CFM) THE HHW CONTROL VALVE WILL BE FULLY CLOSED.

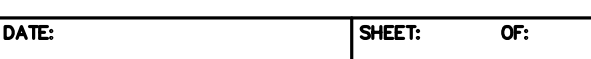
C. SEE SPECIFICATION SECTION 23 9500, PARAGRAPH 1.05, FOR MORE DETAILS.

REMARKS: THIS BUILDING HAS SIEMENS CONTROLS. NEW POINTS SHALL BE ADDED TO EXISTING SYSTEM. THE POINTS DESIGNATED WITH AN X SHALL BE ACCOMPLISHED BY THE UNIT MANUFACTURER. THEY SHALL BE INTERCONNECTED TO THE SIEMENS APOGEE RMS THROUGH THE UNIT MANUFACTURER-PROVIDED RACNET INTERFACE CARD.

REMARKS: THIS BUILDING HAS SIEMENS CONTROLS. NEW POINTS SHALL BE ADDED TO EXISTING SYSTEM.

REMARKS: THIS BUILDING HAS SIEMENS CONTROLS. NEW POINTS SHALL BE ADDED TO EXISTING SYSTEM.

M-4.00 SCALE: NONE





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APPROVAL

REVISION	DESCRIPTION	DATE
	100% CDs	10/02/18

SHEET TITLE:

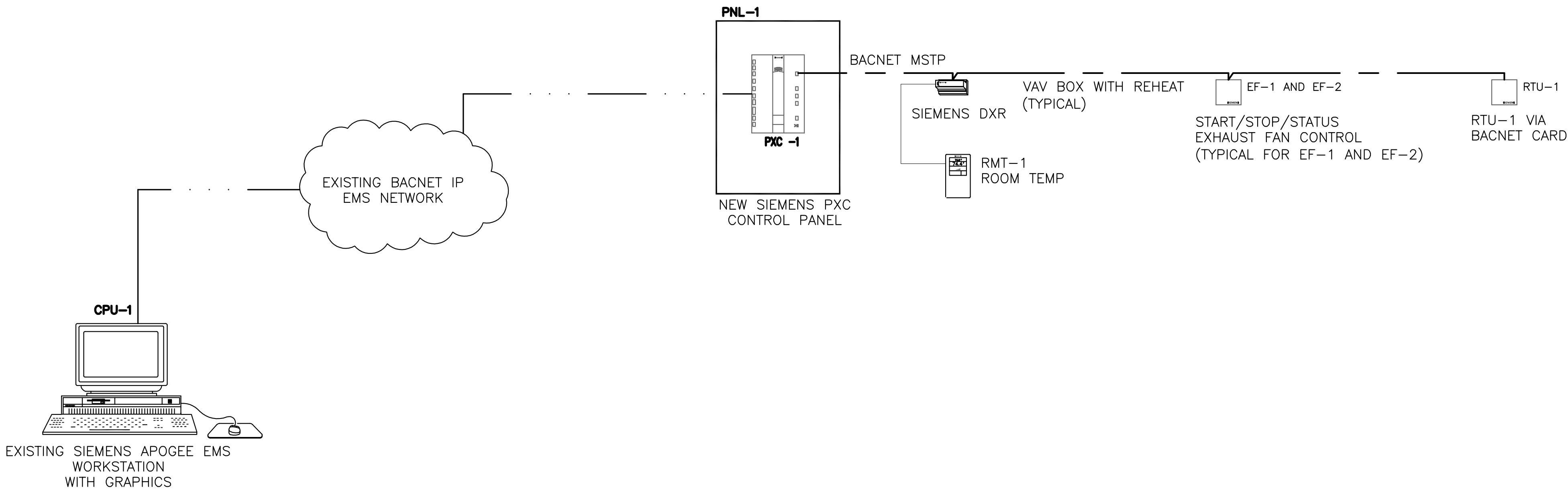
**MECHANICAL
CONTROLS**

HVA PROJECT NO.: 0817.2117.01 PROJECT ARCH: R.H.
DRAWN: CHECKED: R.H.

SHEET NUMBER

M-4.01

DATE: SHEET: OF:



1 SIEMENS EMS RISER (FOR NEW EQUIPMENT; EXISTING NOT SHOWN)
M-4.01 SCALE: NONE



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STAMPS/SEALS



APPROVAL

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	100% CDs	10/02/18

SHEET TITLE:

**MECHANICAL
DETAILS**

HVA PROJECT NO.: 0817.2117.01

PROJECT ARCH: R.H.

DRAWN:

CHECKED: R.H.

SHEET NUMBER

M-5.00

DATE:

SHEET: OF:

DUCT TRANSITION/OFFSET

SCALE: NONE

7

DUCT/VAV SUPPORT DETAIL ON ROOF

SCALE: NONE

4

VAV BOX CEILING MOUNTING DETAIL

SCALE: NONE

1

DUCT SUPPORT MOUNTING DETAIL

SCALE: NONE

10

ROOF PIPE SUPPORT DETAIL

SCALE: NONE

8

RECTANGULAR DUCT DETAIL

SCALE: NONE

5

HEATING COIL PIPING DETAIL

SCALE: NONE

2

DUCT THROUGH WALL DETAIL

SCALE: NONE

9

THERMOSTAT MOUNTING DETAIL

SCALE: NONE

9

RECTANGULAR DUCT DETAIL

SCALE: NONE

6

CONDENSATE DRAIN P-TRAP DETAIL

SCALE: NONE



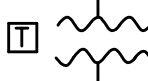


















3

GENERAL NOTES

1. THE CONTRACTOR SHALL SUBMIT LAYOUT DRAWINGS, SHOWING THE BRACING/SUPPORT LOCATIONS AND REFERENCES TO DETAILS FROM THE RELEVANT OSHPD PRE-APPROVALS FOR PIPING/DUCTS/CONDUITS EXCEPT FIRE SPRINKLERS FOR USE BY THE IOR AND OSHPD FIELD STAFF. OSHPD PRE-APPROVAL NO. OPA-0010 FOR SMACNA SEISMIC GUIDELINES SHALL BE USED. THE LAYOUT DRAWINGS, PREPARED PER ASCE 7 CHAPTER 13 AS MODIFIED BY CBC SECTIONS 1613A/1615A, NEED TO BE REVIEWED AND ACCEPTED BY THE AOR AND/OR EOR (SE AND/OR WE/EE) PRIOR TO STARTING INSTALLATION OF THE BRACING/SUPPORT. IOR SHALL ENSURE THE ABOVE REQUIREMENTS ARE SATISFIED.
2. ALL ELECTRICAL PREFABRICATED EQUIPMENT SHALL BE DESIGNED AND CONSTRUCTED IN SUCH A MANNER THAT ALL PORTIONS, ELEMENTS, SUB-ASSEMBLIES AND/OR PARTS OF SAID EQUIPMENT, AND THE EQUIPMENT AS A WHOLE, INCLUDING ITS ATTACHMENTS, WILL RESIST A LOAD WHICH EXCEEDS THE FORCE LEVEL USED TO RESTRAIN AND ANCHOR THE EQUIPMENT TO THE SUPPORTING STRUCTURE.
3. ALL ELECTRICAL MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL BE LISTED BY UNDERWRITER'S LABORATORIES (UL) AND BEAR THEIR LABEL, OR BE LISTED AND CERTIFIED BY A NATIONALLY RECOGNIZED TESTING AUTHORITY WHERE UL DOES NOT HAVE A LISTING. CUSTOM MADE EQUIPMENT SHALL HAVE COMPLETE TEST DATA SUBMITTED BY THE MANUFACTURER ATTESTING TO ITS SAFETY. IN ADDITION, THE MATERIALS, EQUIPMENT, AND INSTALLATION SHALL COMPLY WITH THE MOST CURRENT REQUIREMENTS OF THE FOLLOWING:
AMERICAN SOCIETY OF TESTING MATERIALS (ASTM)
INSULATED POWER CABLE ENGINEERS ASSOCIATION (IPCEA)
NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
AMERICAN STANDARD ASSOCIATION (ASA) NATIONAL FIRE PROTECTION AGENCY (NFPA) AMERICAN NATIONAL STANDARD INSTITUTE (ANSI) CALIFORNIA ELECTRICAL CODE (CEC)
LATEST EDITION CALIFORNIA CODE OF REGULATIONS TITLE 24 (CCR)
INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE) ALL LOCAL CODES HAVING JURISDICTION
- APPLY WHERE THE CODES HAVE DIFFERENT LEVELS OF REQUIREMENTS, THE MOST STRINGENT RULE SHALL
4. THE CONTRACTOR SHALL VISIT THE SITE, INCLUDING ALL AREAS INDICATED ON THE DRAWINGS. HE SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS AND BY SUBMITTING A BID, ACCEPTS THE CONDITIONS UNDER WHICH HE SHALL BE REQUIRED TO PERFORM HIS WORK.
5. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN A COMPLETE SET OF CONTRACT DOCUMENTS, ADDENDA, DRAWINGS AND SPECIFICATIONS. ELECTRICAL CONTRACTOR SHALL CHECK THE DRAWINGS OF THE OTHER TRADES AND SHALL CAREFULLY READ THE ENTIRE SPECIFICATIONS AND DETERMINE HIS RESPONSIBILITIES. FAILURE TO DO SO SHALL NOT RELEASE THE CONTRACTOR FROM DOING THE WORK IN COMPLETE ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS.
6. THE CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS, FEES, CHARGES, AND INCIDENTAL COSTS NECESSARY FOR EXECUTION AND COMPLETION OF ELECTRICAL WORK, INCLUDING ALL CHARGES BY STATE, COUNTY AND LOCAL GOVERNMENTAL AGENCIES.
7. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER TRADES AT THE SITE. ANY COSTS TO INSTALL WORK TO ACCOMPLISH SAID COORDINATION WHICH DIFFERS FROM THE WORK AS SHOWN ON THE DRAWINGS SHALL BE INCURRED BY THE CONTRACTOR. ANY DISCREPANCIES, AMBIGUITIES OR CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT DURING BID TIME FOR CLARIFICATION. ANY SUCH CONFLICTS NOT CLARIFIED PRIOR TO BID SHALL BE SUBJECT TO THE INTERPRETATION OF THE ARCHITECT AT NO ADDITIONAL COST TO THE OWNER.
8. THE CONTRACTOR SHALL PROVIDE AND KEEP UP-TO-DATE A COMPLETE RECORD SET OF DRAWINGS. THESE PRINTS SHALL BE CORRECTED DAILY AND SHOW EVERY CHANGE FROM THE ORIGINAL DRAWINGS. THIS SET OF DRAWINGS SHALL BE KEPT ON THE JOB SITE AND SHALL BE USED ONLY AS A RECORD SET. THIS SHALL NOT BE CONSTRUED AS AUTHORIZATION FOR THE CONTRACTOR TO MAKE CHANGES IN THE LAYOUT WITHOUT DEFINITE INSTRUCTION IN EACH CASE. UPON COMPLETION OF THE WORK, A SET OF REPRODUCIBLE CONTRACT DRAWINGS SHALL BE OBTAINED FROM THE ARCHITECT, AND ALL CHANGES AS NOTED ON THE RECORD SET OF DRAWINGS SHALL BE INCORPORATED THEREON WITH BLACK INK AND BY MOST CURRENT VERSION OF AUTOCAD SOFTWARE IN A NEAT, LEGIBLE, UNDERSTANDABLE AND PROFESSIONAL MANNER. FAILURE TO KEEP RECORD DRAWINGS UP-TO-DATE SHALL CONSTITUTE CAUSE FOR WITHHOLDING OF PROGRESS PAYMENTS.
9. AFTER ALL REQUIREMENTS OF THE SPECIFICATIONS AND/OR THE DRAWINGS HAVE BEEN FULLY COMPLETED, REPRESENTATIVES OF THE OWNER WILL INSPECT THE WORK. THE CONTRACTOR SHALL PROVIDE COMPETENT PERSONNEL TO DEMONSTRATE THE OPERATION OF ANY ITEM OR SYSTEM TO THE FULL SATISFACTION OF EACH REPRESENTATIVE. FINAL ACCEPTANCE OF THE WORK WILL BE MADE BY THE OWNER AFTER RECEIPT OF APPROVAL AND RECOMMENDATION OF ACCEPTANCE FROM EACH REPRESENTATIVE.
11. ALL EQUIPMENT MOUNTED ON THE ROOF FOR CONNECTION OF HVAC EQUIPMENT SHALL BE MOUNTED ON UNISTRUT STANDS UTILIZING APPROVED PITCH POCKETS, FLASHING, ETC.. AS DIRECTED BY ARCHITECT. EQUIPMENT SHALL NOT BE MOUNTED ON HVAC EQUIPMENT.
12. ALL FINAL CONNECTIONS TO OWNER FURNISHED EQUIPMENT SHALL BE MADE BY THE CONTRACTOR.
13. COORDINATE WITH OTHER TRADES AS TO THE EXACT LOCATION AND CONFIGURATION OF THEIR RESPECTIVE EQUIPMENT. SUPPLY POWER AND MAKE CONNECTION TO MOTORS AND EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS AS INDICATED ON THE SINGLE LINE DIAGRAM, ELECTRICAL DRAWINGS, AND DRAWINGS OF OTHER TRADES. REVIEW THE DRAWINGS OF OTHER TRADES FOR CONTROL DIAGRAMS, SIZE AND LOCATION OF EQUIPMENT. DISCONNECT SWITCHES, STARTERS, WIRING, CONTROLS, AND CONDUIT FOR MECHANICAL AND PLUMBING OPERATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING MANUFACTURER'S SHOP DRAWINGS PRIOR TO ROUGHING IN ALL CONDUIT TO THIS EQUIPMENT.
14. EXACT METHOD AND LOCATION OF CONDUIT PENETRATION AND OPENINGS IN CONCRETE OR MASONRY WALLS, GRADE BEAMS, FLOORS OR STRUCTURAL STEEL MEMBERS SHALL BE AS DIRECTED BY THE STRUCTURAL ENGINEER. PERFORM CORING, SAWCUTTING, PATCHING, AND REFINISHING OF WALLS AND SURFACES WHEREVER IT IS NECESSARY TO PENETRATE. OPENINGS SHALL BE SEALED IN AN APPROVED METHOD TO MEET THE FIRE RATING OF THE PARTICULAR WALL, FLOOR OR CEILING. EXACT METHOD AND LOCATIONS OF CONDUIT PENETRATIONS AND OPENINGS IN CONCRETE WALLS OR FLOORS SHALL BE FOR UL APPROVED SYSTEMS.
15. CONNECTIONS TO VIBRATING EQUIPMENT, MECHANICAL AND PLUMBING EQUIPMENT AND SEISMIC SEPARATIONS:
LIQUID-TIGHT FLEXIBLE STEEL CONDUIT IN ALL LOCATIONS
MAXIMUM LENGTH OF FLEXIBLE CONDUIT RUNS SHALL BE 6'-0" UNLESS OTHERWISE NOTED.
16. EQUIPMENT OUTLETS, LIGHTING FIXTURES, CONDUIT, WIRE, AND CONNECTION METHODS IN HVAC AIR-PLenums SHALL BE APPROVED FOR USE IN PLENUMS AND SHALL CONFORM TO THE CALIFORNIA ELECTRICAL CODE.
17. ROUTE EXPOSED CONDUIT AND CONDUIT ABOVE ACCESSIBLE CEILING SPACES PARALLEL AND PERPENDICULAR TO WALLS AND ADJACENT PIPING. ARRANGE CONDUIT TO MAINTAIN HEADROOM AND TO PRESENT A NEAT APPEARANCE.
18. CONDUIT SHALL NOT BE INSTALLED IN FLOOR SLAB. CONDUIT SHALL BE INSTALLED CONCEALED IN THE CEILING SPACE, CONCEALED IN WALLS, OR BELOW SLAB ON GRADE UNLESS NOTED OTHERWISE.
19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAWCUTTING TRENCHING, BACKFILLING, COMPACTION AND PATCHING OF CONCRETE AND ASPHALT AS REQUIRED TO PERFORM HIS WORK. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN TRENCHING FOR HIS WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER AND APPROVED REPAIR OF ANY AND ALL DAMAGES CAUSED BY HIM OR HIS WORK.
20. WHENEVER A DISCREPANCY IN QUANTITY OR SIZE OF CONDUIT, WIRE, EQUIPMENT DEVICES, CIRCUIT BREAKERS, GROUND FAULT PROTECTION SYSTEMS, ETC. (ALL MATERIALS), ARISES ON THE DRAWINGS OR SPECIFICATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL MATERIAL AND SERVICES REQUIRED BY THE STRICTEST CONDITIONS NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS TO ENSURE COMPLETE AND OPERABLE SYSTEMS AS REQUIRED BY THE OWNER AND ARCHITECT/ENGINEER.
21. REFER TO SINGLE LINE DIAGRAM AND FEEDER SCHEDULES FOR CONDUIT AND CONDUCTOR SIZE TO PANELS, TRANSFORMERS, MECHANICAL AND PLUMBING EQUIPMENT, ETC., CONDUIT RUNS MAY NOT BE SHOWN ON DRAWINGS, BUT ARE PART OF THIS CONTRACT.
22. STRAIGHT FEEDER, BRANCH CIRCUIT, AND CONDUIT RUNS SHALL BE PROVIDED WITH SUFFICIENT PULL BOXES OR JUNCTION BOXES TO LENGTHEN THE MAXIMUM LENGTH OF ANY SINGLE CABLE PULL TO 100 FEET. PULL BOXES SHALL BE SIZED PER CODE OR AS INDICATED ON DRAWINGS. LOCATIONS SHALL BE DETERMINED IN THE FIELD OR AS INDICATED ON THE DRAWINGS.
23. MAXIMUM NUMBER OF CONDUCTORS IN OUTLET OR JUNCTION BOXES SHALL CONFORM TO THE CALIFORNIA ELECTRICAL CODE, ARTICLE 314.16, BUT IN NO CASE SHALL CONTAIN MORE THAN THE FOLLOWING NUMBER OF #12 AWG CONDUCTORS FOR THE SIZE OF BOX INDICATED. THE MINIMUM SIZE OUTLET OR JUNCTION BOX PERMITTED IN A WALL IS FOUR INCHES SQUARE BY 1 1/2 INCHES DEEP.
24. WHERE MULTI-HOMERUNS ARE INDICATED ON DRAWINGS INDICATING THE SAME PANELBOARD CIRCUIT NUMBER, PROVIDE JUNCTION BOX ABOVE ACCESSIBLE CEILING AND ROUTE ONE SET OF WIRES TO CIRCUIT BREAKERS.
25. IDENTIFICATION NAMEPLATES SHALL BE MICARTA 1/8 INCH THICK AND OF APPROVED SIZE WITH BEVELED EDGES AND ENGRAVED WHITE LETTERS A MINIMUM OF 1/4 INCH HIGH ON BLACK BACKGROUND. NAMEPLATES SHALL BE PROVIDED FOR ALL CIRCUITS IN THE SERVICE DISTRIBUTION AND POWER DISTRIBUTION SWITCHBOARDS OR PANELBOARDS, MOTOR CONTROL CENTERS, LIGHTING DISTRIBUTION PANELBOARDS, SEPARATELY MOUNTED STARTING SWITCHES, DISCONNECTING SWITCHES, MOTOR CONTROL PUSHBUTTON STATIONS, SELECTOR SWITCHES, TRANSFORMERS, TERMINAL CABINETS, TELEPHONE CABINETS, ETC. ALL NAMEPLATES SHALL BE ATTACHED WITH ADHESIVE, UL LISTING FOR THE APPLICATION, PULLBOXES, JUNCTION BOXES, AND DEVICE BOXES SHALL BE MARKED WITH A PERMANENT MARKER.
26. DRAWINGS ARE DIAGRAMMATIC ONLY AND DO NOT SHOW SPECIAL CONDUIT ROUTING OR LENGTHS REQUIRED FOR A COMPLETE INSTALLATION. ROUTING OF RACEWAYS SHALL BE AT THE OPTION OF THE CONTRACTOR BUT SHALL BE IN STRICT COMPLIANCE WITH STRUCTURAL REQUIREMENTS. NO CONDUIT SHALL BE ROUTED HORIZONTALLY IN MASONRY WALLS IN EXCESS OF 48". DO NOT SCALE THE ELECTRICAL DRAWINGS FOR LOCATIONS OF ANY ELECTRICAL, ARCHITECTURAL, STRUCTURAL, CIVIL, OR MECHANICAL ITEMS OR FEATURES, REFER TO ARCHITECTURAL AND STRUCTURAL DIMENSIONAL DRAWINGS.

27. THE EQUIPMENT GROUNDING CONDUCTOR EVEN THOSE NOT SHOWN ON CONDUIT RUNS, SHALL BE INSTALLED AND RUN CONTINUOUS FROM PANEL TO LAST OUTLET. THIS WIRE SHALL BE PITGAILED IN EACH OUTLET FOR CONNECTION TO BOX ANCE DEVICE SO THAT IF DEVICE IS REMOVED, GROUND WILL NOT BE INTERRUPTED. ALL EQUIPMENT GROUNDING CONDUCTORS SHALL BE INSULATED GREEN. CONDUCTORS-ALTERNATE METHODS OF IDENTIFICATION SHALL NOT BE USED. CONTRACTOR SHALL NOTIFY ELECTRICAL ENGINEER TO EXAMINE CONDUCTOR INSTALLATION PRIOR TO INSTALLATION OF DEVICES.
28. JUNCTION AND PULL BOXES: FOR INTERIOR DRY LOCATIONS, BOXES SHALL BE GALVANIZED ONE-PIECE, DRAWN STEEL, KNOCKOUT TYPE WITH REMOVABLE MACHINE SCREW SECURED COVERS. FOR OUTSIDE, DAMP, OR SURFACE LOCATIONS, BOXES SHALL BE HEAVY CAST ALUMINUM OR CAST IRON WITH REMOVABLE, GASKETED, NON-FERROUS MACHINE SCREW SECURED COVERS. BOXES SHALL BE SIZED FOR THE NUMBER AND SIZES OF CONDUCTORS AND CONDUIT ENTERING THE BOX AND EQUIPPED WITH PLASTER EXTENSION RINGS WHERE REQUIRED. BOXES SHALL BE LABELED TO INDICATE PANEL AND CIRCUIT NUMBER, OR TYPE OF SIGNAL OR COMMUNICATIONS SYSTEM.
29. WHEN CONFLICTS OCCUR ON DRAWINGS AND IN SPECIFICATIONS, THE MOST STRINGENT REQUIREMENT SHALL APPLY AND SHALL BE PART OF THE BASE BID.
30. WHERE OUTLETS OCCUR AT TACKABLE WALL PANELS OR OTHER WALL FINISHED, PROVIDE EXTENSION RINGS AS REQUIRED SO THAT NO SPACE WILL EXIST BETWEEN DEVICE PLATE AND BACKBOX, PER NEC 370.20, TYPICAL. SEE ARCHITECTURAL ELEVATIONS FOR WALL FINISHES AND LOCATIONS.
31. IT IS THE INTENT OF THE PLANS AND SPECIFICATIONS THAT A COMPLETE AND WORKABLE ELECTRICAL INSTALLATION BE PROVIDED BE PROVIDED FOR ALL THE EQUIPMENT DESCRIBED OR SHOWN AS BEING IN THIS CONTRACT. FURNISH ALL LABOR AND TOOLS NECESSARY AND FURNISH ALL INSTALL. ALL APPARATUS, MATERIALS AND EQUIPMENT IN A MANNER COMPLYING WITH ALL APPLICABLE CODES, INCLUDING ITEMS REQUIRED BUT NOT NORMALLY SHOWN, SUCH AS LAMPS, HANGERS, BRACKETS, CLAMPS, COUPLINGS, BOXES, CONNECTORS AND HARDWARE REFER ALSO TO WRITTEN SPECIFICATIONS FOR GENERAL, MECHANICAL AND ELECTRICAL SECTIONS.
32. DO NOT RUN ANY CONDUIT IN SLAB WITHOUT APPROVAL FROM STRUCTURAL ENGINEER. CONDUIT OUTSIDE DIAMETER SHALL NOT EXCEEDS 1/3 THE THICKNESS OF SLAB. LOCATE CONDUITS WITHIN THE MIDDLE OF THE SLAB WHERE CONDUITS ARE GROUPED IN PARALLEL RUNS, SPACE THEM 3" OR MORE APART WHERE CONDUITS CROSS EACH OTHER, THICKEN SLAB PROPORTIONATELY OVER A HORIZONTAL AREA EQUAL TO TEN TIMES THE DIAMETER OF THE LARGEST DIAMETER.
33. ANY LENGTH OF FEEDERS OR BRANCH CIRCUITS SHOWN ON ALL DRAWINGS ARE FOR USE IN DESIGN CALCULATIONS ONLY AND NOT TO BE USED FOR COST ESTIMATE OR ANY OTHER PURPOSES.
34. THE CONTRACTOR SHALL RUN AN X-RAY SURVEY OF THE UNDERGROUND STRUCTURES ON THE PATH OF THE NEW TRENCH SHOWN ON THESE PLANS. IT SHALL BE CONTRACTORS RESPONSIBILITY TO ACCURATELY LOCATE ANY BELOW GROUND STRUCTURE THAT MAY INTERFERE WITH THIS WORK, ANY DAMAGE TO EXISTING STRUCTURES RESULTING FROM THIS WORK SHALL BE REPAIRED IMMEDIATELY TO MATCH EXISTING AT NO ADDITIONAL COST TO THE OWNER.
35. THE CONTRACTOR SHALL PROVIDE ENGRAVED NAME PLATE TO ALL CONDUITS, TO ALL CABLES AND TO ALL NYLON PULL STRING BOTH LOCATIONS (ENTRANCE AND EXIT) IN ALL PANELS, IN ALL EQUIPMENTS, AT ALL TERMINAL BACKBOARDS, IN ALL TERMINAL CABINETS, AND IN ALL PULLBOXES. SUBMIT NAME PLATES SUBMITTALS AND METHOD OF INSTALLATION FOR APPROVAL PRIOR TO INSTALLATION.
36. ALL CABLE FOR UNDERGROUND AND EXTERIOR APPLICATION SHALL BE WATERPROOF TYPE.
37. ALL EQUIPMENT FOR EXTERIOR APPLICATION SHALL HAVE WEATHERPROOF ENCLOSURE.
38. THE CONTRACTOR SHALL PERFORM A COMPLETE SHORT CIRCUIT AND PROTECTIVE DEVICE COORDINATION STUDY BASED ON MOST CURRENT DATA FROM UTILITY COMPANY AND PROVIDE EQUIPMENT WITH INTERRUPTING RATING EQUAL OR EXCEED THE CALCULATED VALUE NOT TO BE LOWER THAN THOSE SHOWN ON CONTRACT DOCUMENT.
39. ARC FAULT CIRCUIT INTERRUPTERS (AFCIs) SHALL BE PROVIDED IN AREAS REQUIRED PER CEC 210.12
40. GROUND FAULT PROTECTION DEVICES SHALL BE PROVIDED IN AREAS REQUIRED BY CEC 210.8
41. PANELBOARD SHALL HAVE BOLT-ON TYPE CIRCUIT BREAKERS.
42. CONDUCTORS SHALL BE COPPER WITH TYPE THHN/THWN DUAL RATING, 600V INSULATION, UNLESS NOTED OTHERWISE.
43. ALL PANELBOARDS AND SWITCHBOARDS SHALL BE FULLY RATED. SERIES RATING IS NOT ALLOWED.
44. CIRCUIT BREAKER WITH FRAME SIZE 400 AMP OR LARGER SHALL BE 100 PERCENT RATED WITH SOLID STATE TRIP SETTINGS.
45. PROVIDE SHOP DRAWINGS INCLUDING EQUIPMENT SUPPORTS AND MOUNTING DETAILS. DETAILS WITH TO STRUCTURAL IMPLICATION SHALL BE APPROVED BY LICENSED STRUCTURAL ENGINEER RETAINED BY THE CONTRACTOR. CONTRACTOR SHALL VERIFY DIMENSIONS OF EQUIPMENT AND MAKE SURE THEY COMPLY WITH ALL APPLICABLE CODE REQUIREMENTS RELATING TO CLEAR WORKING SPACE AROUND ELECTRICAL EQUIPMENT. CONTRACTOR SHALL REFLECT ALL NEW ELECTRICAL EQUIPMENT LOCATIONS ON SHOP DRAWINGS.
46. SUBSTITUTION OF ANY MATERIAL OR EQUIPMENT SHALL BE APPROVED BY ENGINEER BEFORE INSTALLATION.
47. CONTRACTOR IS TO DEMONSTRATE THAT ALL EQUIPMENT AND SYSTEMS ARE INSTALLED AND FUNCTIONING PROPERLY BY PERFORMING ALL NECESSARY FIELD TESTING PRIOR TO THE FINAL ACCEPTANCE OF WORK
48. SCHEDULED FACILITY DOWN TIME DUE TO POWER SHUT DOWN SHALL HAVE WRITTEN APPROVAL FROM OWNER UPON ADVANCE NOTICE. PROVIDE GENERATORS AND ALL NECESSARY TIE-IN EQUIPMENT AS PART OF SCOPE OF WORK FOR TEMPORARY POWER IF EXTENSIVE DOWN TIME (OVER 48 HOURS) IS REQUIRED.
49. OWNER ELECTRICAL STANDARDS TO BE HUBBEL AND SQUARE D.

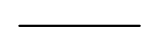


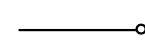
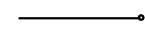
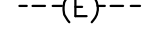
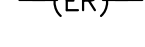
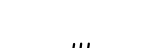
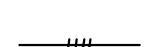
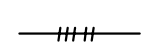
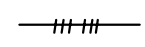
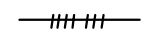
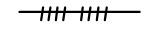
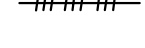
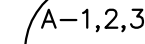

POWER SYMBOLS

-  DISTRIBUTION PANELBOARD
-  MAIN SWITCHBOARD
-  TRANSFORMER
-  DUPLEX CONVENIENCE RECEPTACLE PER SPECIFICATION WALL MOUNTED, INSTALLED AT 15" A.F.F. MEASURED FROM THE BOTTOM OF OUTLET BOX (U.O.N.)
-  GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLE PER SPECIFICATION, WALL MOUNT, INSTALLED AT 15" A.F.F. MEASURED FROM THE BOTTOM OF OUTLET BOX (U.O.N.)
-  QUADRUPLE CONVENIENCE RECEPTACLE PER SPECIFICATION, WALL MOUNTED, INSTALLED AT 15" A.F.F. MEASURED FROM THE BOTTOM OF OUTLET BOX (U.O.N.)
-  CEILING MOUNTED DUPLEX RECEPTACLE
-  SPECIAL TYPE RECEPTACLE PER SPECIFICATION, WALL MOUNTED, INSTALLED AT 15" A.F.F. MEASURED FROM THE BOTTOM OF OUTLET BOX (U.O.N.). SEE DEVICE KEYNOTE CALL OUT.
-  JUNCTION BOX IN ACCESSABLE CEILING SPACE PROVIDE ACCESS PANEL AS NECESSARY.
-  JUNCTION BOX WALL MOUNTED
-  FUSED DISCONNECT SWITCH, HEAVY DUTY TYPE
-  NON-FUSED DISCONNECT SWITCH, HEAVY DUTY TYPE
-  ELECTRICAL MOTOR
-  COMBINATION FUSED DISCONNECT SWITCH/STARTER, HEAVY DUTY TYPE
-  SURFACE MOUNT PANELBOARD
-  FLUSH MOUNT PANELBOARD
-  SURFACE MOUNTED UL LISTED ENCLOSURE, SIZE AS NECESSARY
-  MOTOR STARTER, NEMA SIZE 1, OR AS INDICATED
-  CIRCUIT BREAKER
-  SWITCH, SINGLE POLE
-  MANUAL MOTOR STARTER SWITCH





APPLICABLE CODES

- 2016 CALIFORNIA ADMINISTRATIVE CODE (CAC)
PART 1, TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR)
- 2016 CALIFORNIA BUILDING CODE (CBC)
PART 2, TITLE 24, CCR
- 2016 CALIFORNIA ELECTRICAL CODE (CEC)
PART 3, TITLE 24, CCR
- 2016 CALIFORNIA MECHANICAL CODE (CMC)
PART 4, TITLE 24, CCR
- 2016 CALIFORNIA PLUMBING CODE (CPC)
PART 5, TITLE 24, CCR
- 2016 CALIFORNIA FIRE CODE (CFC)
PART 9, TITLE 24, CCR






BRANCH CIRCUIT SYMBOLS

-  WRING/CONDUIT CONCEALED IN OR ABOVE CEILING OR IN ABOVE GROUND FLOOR SLAB
-  CONTROL WIRING
-  EMERGENCY WIRING/CONDUIT
-  CONDUIT TURNED UP
-  CONDUIT TURNED DOWN
-  EXISTING CONDUIT TO BE REMOVED
-  EXISTING CONDUIT TO REMAIN
-  2-#12, 3/4" CONDUIT W/ 1#12 G
-  3-#12, 3/4" CONDUIT W/ 1#12 G
-  4-#12, 3/4" CONDUIT W/ 1#12 G
-  5-#12, 3/4" CONDUIT W/ 1#12 G
-  6-#12, 3/4" CONDUIT W/ 1#12 G
-  7-#12, 3/4" CONDUIT W/ 1#12 G
-  8-#12, 1" CONDUIT W/ 1#12 G
-  9-#12, 1" CONDUIT W/ 1#12 G
-  DENOTES 3/4" (U.O.N) HOMERUN TO PANELBOARD OR FIRE ALARM PANEL A CIRCUITS 1,2,3

ANNOTATIONS

-  PLAN NOTE DESIGNATION
-  FEEDER DESIGNATION, SEE FEEDER SCHEDULE.
-  DETAIL CALL-OUT DETA
"A" DRAWN ON DWG. NO. "E-2"
-  MECHANICAL EQUIPMENT DESIGNATION
EF-INDICATES EXHAUST FAN
1-INDICATES EXHAUST FAN NUMBER 1

POWER SYMBOLS (CONTINUATION)

-  DUPLEX RECEPTACLE PER SPECIFICATION, BLUE COLOR WITH INTEGRAL TVSS PROTECTION MOUNTED @ +15" A.F.F. MEASURED FROM THE BOTTOM OF THE OUTLET (U.O.N.) OR SERVED BY A CIRCUIT FROM TVSS PROTECTED PANEL.
-  SAME AS ABOVE EXCEPT GFCI PROTECTED.
-  QUAD RECEPTACLE PER SPECIFICATION, BLUE COLOR WITH INTEGRAL TVSS PROTECTION MOUNTED @ +15" A.F.F. MEASURED FROM THE BOTTOM OF THE OUTLET (U.O.N.) OR SERVED BY A CIRCUIT FROM TVSS PROTECTED PANEL.
-  CEILING MOUNTED MOTION DETECTOR.
-  TV OUTLET.

DRAWING INDEX

- E-1.00 GENERAL NOTES, SYMBOL LIST & ABBREVIATIONS
- E-2.00 ELECTRICAL PARTIAL SECOND FLOOR PLAN
- E-2.10 ELECTRICAL ROOF PLAN
- E-3.00 ELECTRICAL SINGLE LINE DIAGRAM AND PANEL SCHEDULE

DEMOLITION NOTES

1. THE CONTRACTOR SHALL VISIT THE SITE SPECIFICALLY INCLUDING ALL AREAS INDICATED ON THE DRAWINGS. HE SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH THESE EXISTING CONDITIONS, AND BY SUBMITTING A BID ACCEPTS CONDITIONS UNDER WHICH HE WILL BE REQUIRED TO PERFORM HIS WORK.
2. IT SHALL BE THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO DISCONNECT, REMOVE, RELOCATE AND REINSTALL ALL EXISTING LIGHTING FIXTURES, RECEPTACLES, ELECTRICAL EQUIPMENT, ETC. WHICH, IS AFFECTED BY AFFECTED OR IN PHYSICAL CONFLICT WITH THE NEW WORK. THIS WILL INCLUDE REROUTING, OR THE EXTENSION OF, EXISTING CONDUIT AND FEEDERS WHERE NECESSARY TO MAINTAIN THE CONTINUITY OF EXISTING EQUIPMENT REMAINING. THIS SHALL BE DONE SO THAT ALL SYSTEMS IN ALL PHASES (THOSE COMPLETED AND THOSE YET TO BEGIN), ARE IN COMPLETE, OPERABLE CONDITION AS CONSTRUCTION PROCEEDS THROUGH EACH PHASE.
3. ALL CIRCUIT NUMBERS AND EXISTING CONDUIT HOMERUNS SHOWN ON THESE DRAWINGS WERE TAKEN FROM EXISTING RECORD DRAWINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY LOCATIONS OF HOMERUNS, AND ADJUST CIRCUIT NUMBERS ACCORDING TO EXISTING CONDITIONS IF REQUIRED.
4. WHERE EXISTING CONDUIT FEEDS, ELECTRICAL BOXES OR OTHER ELECTRICAL DEVICES HAVE BEEN REMOVED OR RELOCATED, IT IS THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY AND DIMENSION ALL SUCH REVISIONS ON THE "AS-BUILT" DRAWINGS UNLESS OTHERWISE NOTED.
5. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO MAINTAIN CONTINUITY OF ALL ELECTRICAL SYSTEMS, EQUIPMENT, ETC., WHEN SOME ELECTRICAL CONDUITS OR DEVICES HAVE BEEN REMOVED OR RELOCATED. MAINTAINING CONTINUITY SHALL CONSIST OF REROUTING CONDUIT, WRING, ETC., AS REQUIRED.
6. ALL ELECTRICAL FIXTURES, OUTLETS, DEVICES, ETC., THAT ARE REMOVED SHALL BE REMOVED COMPLETELY, INCLUDING CONDUIT AND WRING BACK TO THE LAST FIXTURE, OUTLET, DEVICE, ETC., REMAINING IN SERVICE.
7. EXISTING CIRCUITS WHICH ARE REMOVED AND NOT REUSED SHALL BE IDENTIFIED ON THE PANEL SCHEDULE AS "SPARE."
8. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE OWNER PRIOR TO REMOVAL OF EXISTING ELECTRICAL EQUIPMENT, AND TURN OVER REMOVED EQUIPMENT THAT THE OWNER REQUESTS AS AN "AS-FOUND" CONDITION. EQUIPMENT THAT IS TO BE RETURNED OVER SHALL BE BOXED AND TAGGED TO IDENTIFY THE SPECIFIC EQUIPMENT.
9. WHERE NEW CIRCUITS ARE SHOWN IN EXISTING PANELS, INSTALL NEW BREAKERS AS CALLED FOR ON DRAWINGS. IDENTIFY EACH NEW CIRCUIT ON PANEL SCHEDULE.
10. EXISTING CONDUIT MAY BE REUSED IF ADEQUATELY SIZED.
11. ALL LIGHTING FIXTURES REMOVED TO ACCOMPLISH THE WORK SHALL BE REINSTALLED SIMILAR TO NEW WORK.
12. WHERE THE NEW BUSWAY OR CONDUIT RUN IS IN PHYSICAL CONFLICT WITH THE EXISTING CONDUIT FEEDS, IT IS THE CONTRACTOR'S RESPONSIBILITY TO DISCONNECT, REMOVE, REROUTE AND REINSTALL THESE CONDUITS, AFFECTED BY NEW BUSWAY OR NEW CONDUIT RUNS. THIS WILL INCLUDE REROUTING WITH NEW CONDUITS AND WIRES (MATCH EXISTING), JUNCTION BOXES AND EXTENSION OF EXISTING CONDUITS WHERE NECESSARY TO MAINTAIN THE CONTINUITY OF EXISTING EQUIPMENT REMAINING.
13. CONTRACTOR SHALL PROTECT ALL EXISTING SYSTEMS WHICH ARE TO REMAIN, INCLUDING BUT NOT LIMITED TO: VOICE, DATA, FIRE ALARM, SECURITY, CLOCK, BELL, POWER AND LIGHTING SYSTEMS. ALL OUTLETS, HARDWARE, CONDUIT AND CONDUCTORS TO BE SECURED FROM ANY DAMAGE. CONTRACTOR SHALL TEST ALL EXISTING OUTLETS, HARDWARE, CONDUIT AND CONDUCTORS (THAT ARE WITHIN THE SCOPE OF WORK), PRIOR TO COMMENCEMENT OF WORK, AND PROVIDE A WRITTEN REPORT TO OWNER/ARCHITECT, INDICATING ANY FAILURES OR DAMAGE TO OUTLETS, HARDWARE, CONDUIT OR CONDUCTORS.
14. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL RE-TEST ALL SYSTEMS AND BE RESPONSIBLE FOR ANY AND ALL REPAIRS NECESSARY TO RESTORE OPERATION OF ALL SYSTEMS, TO THE SATISFACTION OF THE OWNER AND ENGINEER.
15. MAXIMUM OF (3) BRANCH CIRCUIT HOMERUNS, TO THE SAME PANEL, MAY SHARE CONDUIT.

ABBREVIATIONS

SYMBOL	DESCRIPTION
AFF	ABOVE FINISH FLOOR
C	CONDUIT-RACEWAY
CKT	CIRCUIT
C.O.	CONDUIT ONLY. PROVIDE NYLON PULL CHORD FOR ALL EMPTY CONDUIT AS REQUIRED
EMT	ELECTRICAL METALLIC TUBING
(E)	EXISTING TO REMAIN
(ER)	EXISTING TO BE REMOVED
FA	FIRE ALARM
FAA	FIRE ALARM ANNUNCIATOR
FACP	FIRE ALARM CONTROL PANEL
FATC	FIRE ALARM TERMINAL CABINET
FCPS	FIRE ALARM POWER SUPPLY
GND	GROUND OR GROUNDING
LBUSD	LONG BEACH UNIFIED SCHOOL DISTRICT
LHD	LINEAR HEAT DETECTOR
KW	KILOWATTS
MTTB	MAIN TELEPHONE BACKBOARD
(N)	NEW
NEC	2002 NATIONAL ELECTRICAL CODE/NFPA-70
NTS	NOT TO SCALE
PNL	PANEL OR PANEL BOARD
RGS	RIGID GALVANIZED STEEL CONDUIT
RPS	REMOTE POWER SUPPLY
TPP	TYPICAL
UG	UNDERGROUND
V	VOLT
W	WIRE
WP	WEATHERPROOF
U.O.N.	UNLESS OTHERWISE NOTED



PROJECT TITLE AND LOCATION

BRENDA VILLA
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SHEET TITLE:

GENERAL NOTES,
SYMBOL LIST &
ABBREVIATION

HOW PROJECT NO.: 0817.2117.01 PROJECT ARCH: R.H.
DRAWN: CHECKED: R.H.

SHEET NUMBER

E-1.00

DATE: SHEET: OF:



PROJECT TITLE AND LOCATION

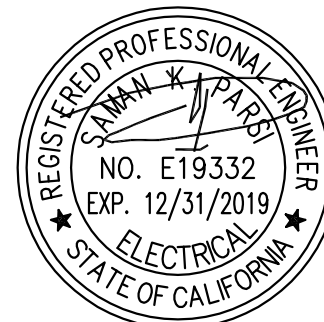
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SHEET TITLE:

ELECTRICAL
PARTIAL SECOND
FLOOR PLAN

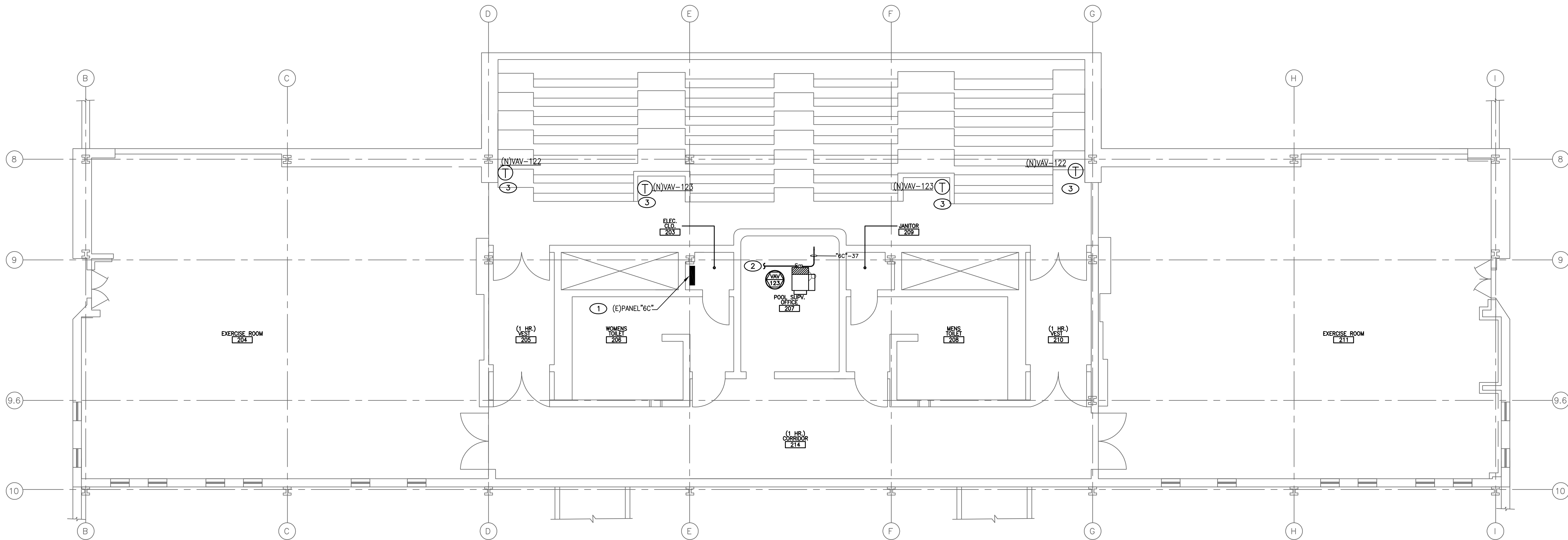
HVA PROJECT NO.: 0817.2117.01 PROJECT ARCH: R.H.

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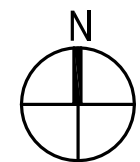
SHEET NUMBER

E-2.00

DATE: SHEET: OF:



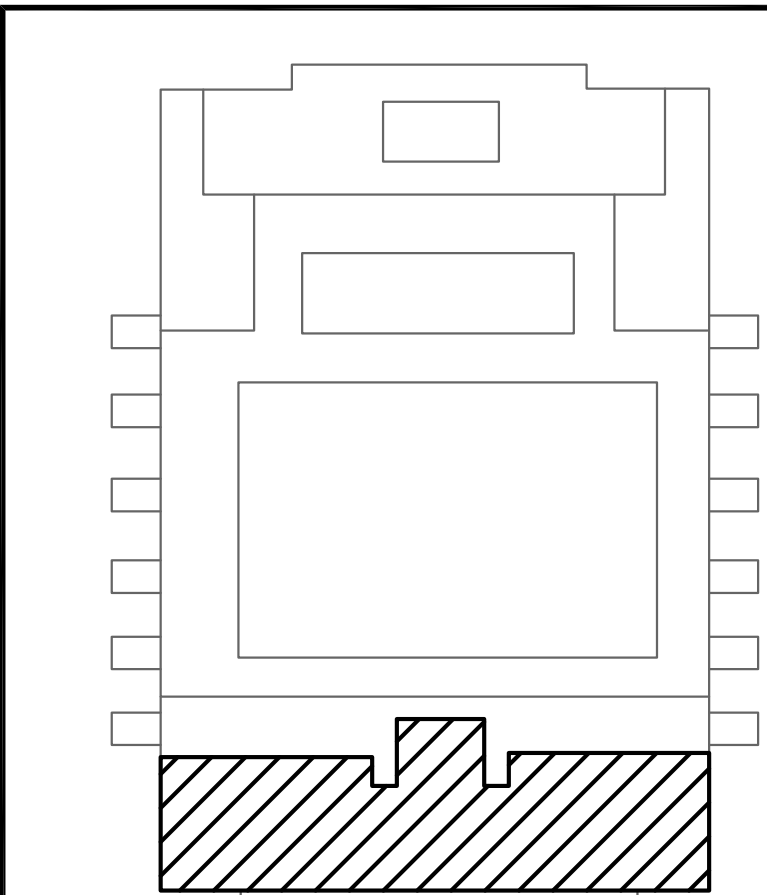
1 ELECTRICAL PARTIAL SECOND FLOOR PLAN
SCALE: 3/16" = 1'-0"



NEW CONSTRUCTION KEY NOTES:

- EXISTING PANEL BOARD "6C". FED FROM EXISTING SWITCHGEAR "SSC", LOCATED IN ROOM 149 IN SOUTH PART OF THE BUILDING. REFER TO KEY PLAN (THIS SHEET) FOR LOCATION OF ELECTRICAL ROOM. REFER TO PANEL SCHEDULE FOR LOAD INFORMATION.
- 3 / 4" C.O TO RESPECTIVE THERMOSTAT CONTROL.
- VAV THERMOSTAT CONTROL. CONTRACTOR SHALL VERIFY EXACT LOCATION IN FIELD.

LOCATION OF
ELECTRICAL
ROOM #149



KEY PLAN



PROJECT TITLE AND LOCATION

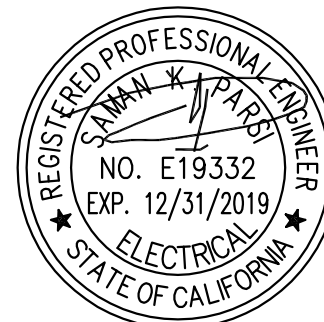
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SHEET TITLE:

ELECTRICAL
ROOF PLAN

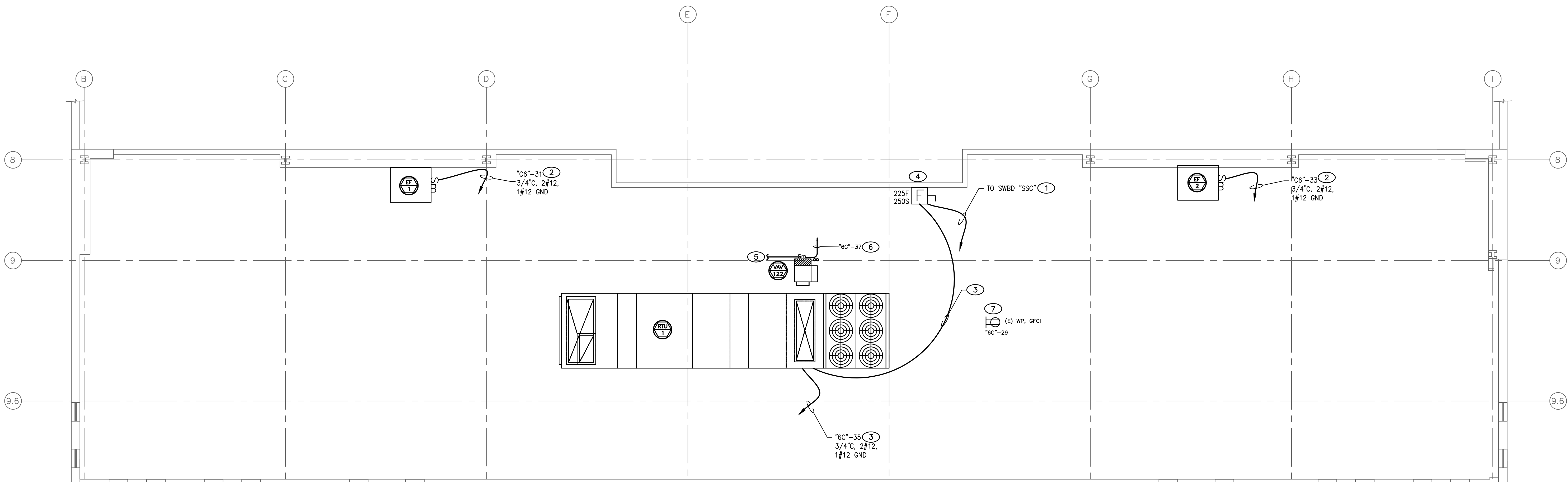
HVA PROJECT NO.: 0817.2117.01 PROJECT ARCH: R.H.

DRAWN: CHECKED: R.H.

SHEET NUMBER

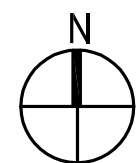
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DATE: SHEET: OF:



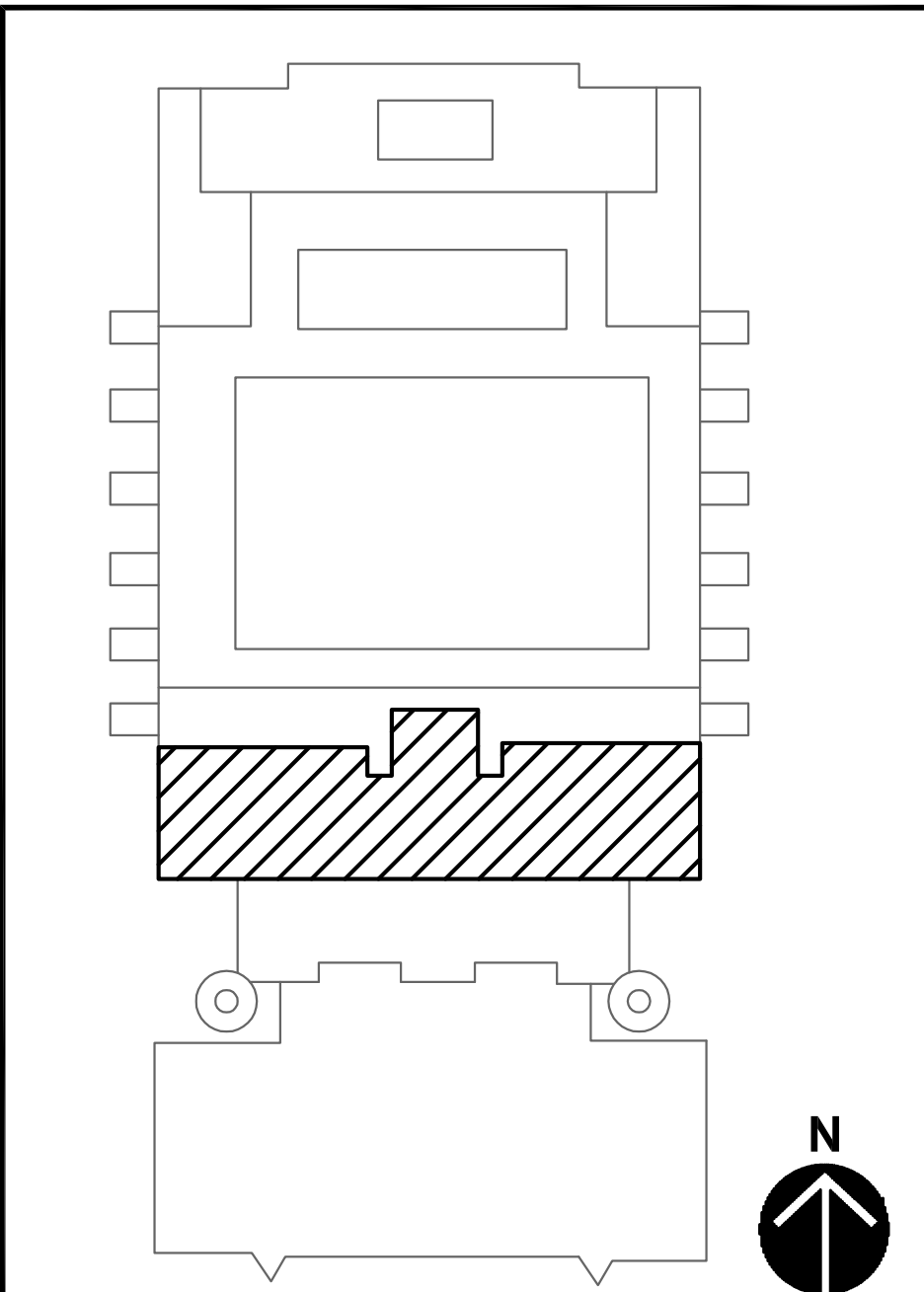
1 ELECTRICAL ROOF PLAN

SCALE: 3/16" = 1'-0"

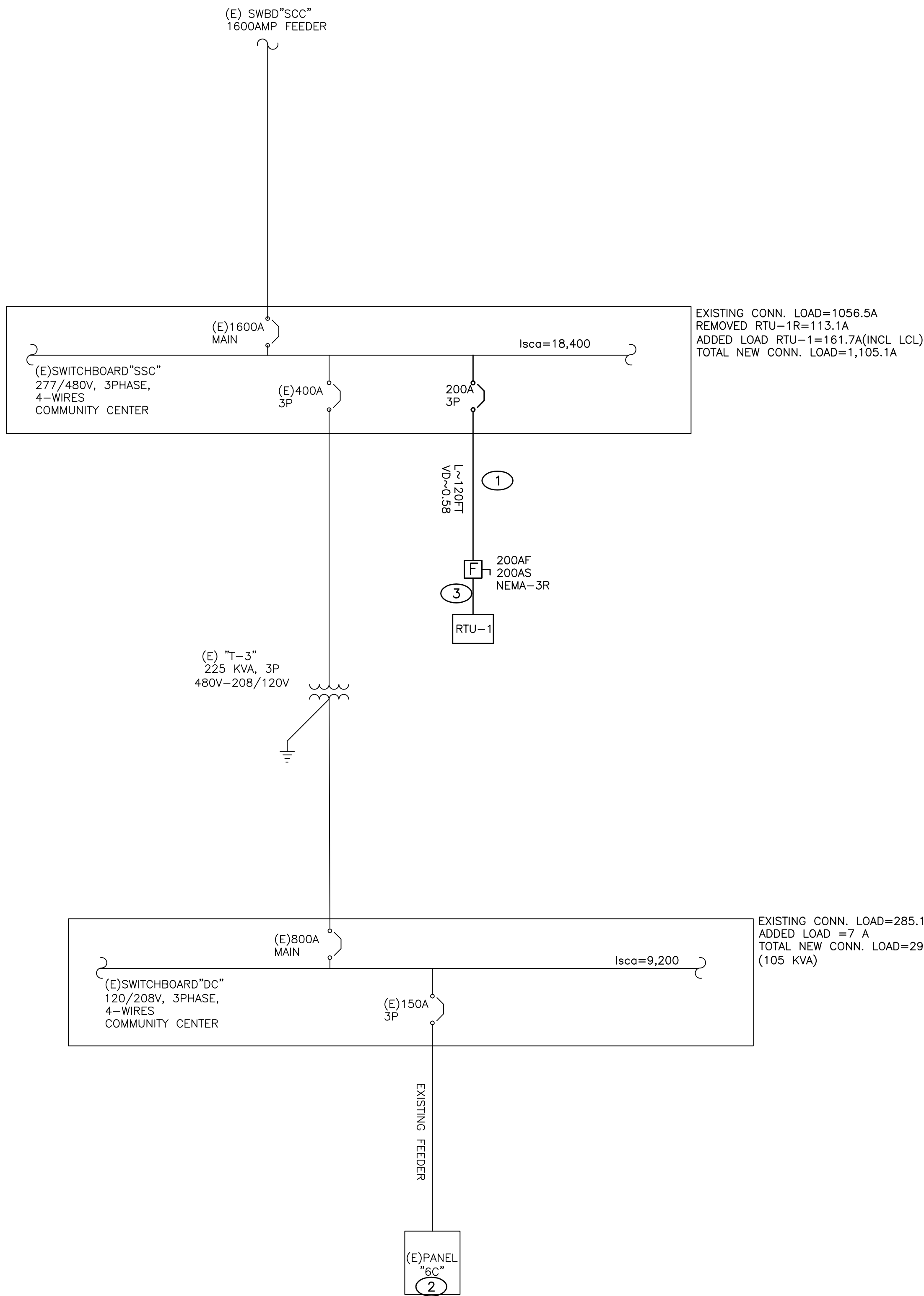


NEW CONSTRUCTION KEY NOTES:

- 1 REFER TO THE SINGLE LINE DIAGRAM FOR FEEDER AND CONDUIT SIZE.
- 2 REFER TO PANEL "6C" SCHEDULE.
- 3 INSTALL FEEDER/BRANCH CIRCUIT BELOW IN CEILING SPACE AND PENETRATE UNIT FROM BELOW THROUGH THE 3" KNOCK OUTS.
- 4 INTERCEPT EXISTING FEEDER FOR REMOVED RTU-1R AT THIS APPROXIMATE LOCATION. REMOVE CONDUCTORS BACK TO SOURCE. PROTECT EXISTING 2" CONDUIT IN PLACE. INSTALL DISCONNECT SWITCH AND PROVIDE NEW FEEDER TO NEW RTU-1 AS SHOWN IN ONE LINE DIAGRAM AND CONNECT AS REQUIRED.
- 5 3/4" C.O TO RESPECTIVE THERMOSTAT CONTROL.
- 6 CONNECT TO THE SAME VAV CIRCUIT SHOWN ON SECOND FLOOR.
- 7 EXISTING RECEPTACLE ON ROOF. PROTECT IN PLACE.



KEY PLAN



KEY NOTES:

- 1 THE EXISTING 2" CONDUIT SHALL BE RETAINED IN THE FIELD. PROVIDE NEW 3#4/0, 1#4 GND AND RECONNECT AS REQUIRED.
- 2 EXISTING PANEL EFFECTED BY THE REMODEL. NEW CIRCUIT BREAKER SHALL MATCH THE HIGHEST AIC BREAKER RATING IN THE PANE. INSPECTOR TO VERIFY.
- 2 NEW 2"C-3 # 4/0, 1#4 GND.

OKT No.	C/B AMP/P	SERVICE	LOAD KVA						SERVICE	C/B AMP/P	OKT No.
			TOTAL	TYPE	A	B	C	TYPE TOTAL			
1	20/1	EXISTING	0.90	M				M 133	EXISTING	20/2	2
3	20/1	EXISTING	0.90	M		0.90			EXISTING	20/1	4
5	20/1	EXISTING	1.00	M			2.00	M 100	EXISTING	20/1	6
7	20/1	EXISTING	1.08	M	2.08			M 100	EXISTING	20/1	8
9	20/1	EXISTING	1.20	M		2.20		M 100	EXISTING	20/1	10
11	20/1	EXISTING	1.10	M			2.10	M 100	EXISTING	20/1	12
13	20/2	EXISTING	1.00	M	2.00			M 100	EXISTING	20/2	14
15	20/1	EXISTING	2.85	M		3.85		M 100	EXISTING	20/2	16
17	20/1	EXISTING	1.00	M			2.00	M 100	EXISTING	20/2	18
19	20/1	EXISTING	1.00	M	3.04			M 204	EXISTING	20/2	20
21	20/1	EXISTING	1.00	M		2.00		M 100	EXISTING	20/2	22
23	20/1	EXISTING	1.00	M			2.00	M 100	EXISTING	20/2	24
25	20/1	SPARE			1.00			M 100	EXISTING	20/1	26
27	20/2	EXISTING	0.50	M		1.50		M 100	EXISTING	20/1	28
29	20/1	EXISTING	0.88	M			2.98	M 23	EXISTING	30/1	30
31	20/1	EXHAUST FAN1	0.80	M	3.10			M 23	EXISTING	30/1	32
33	20/1	EXHAUST FAN2	0.80	M		0.80			SPARE	20/1	34
35	20/1	RTU RECEPTACLE AND LIGHT	0.50	R			0.50		SPARE	20/1	36
37	20/1	VAV BOXES -END FLR & ROOF	0.20	M	0.20				SPACE		38
39		SPACE							SPACE		40
41		SPACE							SPACE		42
CONNECTED LOAD PER PHASE			11.42	11.25	11.58	(PANEL PLICARD)					
LOAD SUMMARY			CONN. KVA	DEMAND FACTOR	DEMAND KVA	VOLTS:		120/208V, 3PH, 4W			
TYPE "L" CONTINUOUS LOADS				125%		MAN C.B.:		225A			
TYPE "R" RECEPTACLES (FIRST 10KVA)			0.50	100%	0.50	BUS:		42			
RECEPTACLES (OVER 10KVA)				50%		POLES:		SUEFACE			
TYPE "M" MISCELLANEOUS LOADS			35.98	100%	35.98	MOUNTING:					
TYPE "A" AC LOADS				100%		A/C RATING:					
TYPE "K" KITCHEN LOADS				65%		DEMAND AMPS		MAX. CONNECTED LOAD TO ONE PHASE			
LARGEST MOTOR LOAD				25%		AMPS		96.50			
TOTAL			34.25		36.48	101.33					



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SHEET TITLE:

ELECTRICAL
SINGLE LINE
AND PANEL
SCHEDULE

HVA PROJECT NO.: 0817.2117.01 PROJECT ARCH: R.H.

DRAWN: CHECKED: R.H.

SHEET NUMBER

E-3.00

DATE: SHEET: OF: