

HVAC GENERAL NOTES

- CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMIT FEES, INSPECTIONS, AND LICENSES REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
- CONTRACTOR MUST BE REGISTERED, HAVE NECESSARY LICENSES, OBTAIN NECESSARY PERMITS, AND HAVE CONSENT FROM ALL GOVERNMENTAL AGENCIES TO CARRY OUT THE WORK OF THE CONTRACT.
- ALL WORK AND MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH CURRENT SMACNA STANDARDS, CURRENT ASHRAE GUIDELINES, AND ALL APPLICABLE STATE AND LOCAL BUILDING CODES.
- CONTRACTOR SHALL REMOVE AND Haul AWAY FROM THE PREMISES ALL UNUSED MATERIALS AND DEBRIS RESULTING FROM THE PERFORMANCE OF THE CONTRACT AND SHALL BEAR THE COST OF DISPOSAL.
- CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING AND PATCHING OF WALLS, ROOF, AND FLOORS, INCLUDING SAW CUTTING AND CORE DRILLING. ANY CUTTING AND DRILLING REQUIRED OF STRUCTURAL ELEMENTS THAT IS NOT SHOWN ON THE DRAWINGS SHALL BE BROUGHT TO THE OWNERS REPRESENTATIVES ATTENTION PRIOR TO PERFORMING THE WORK. CONTRACTOR SHALL SUBMIT PROPOSED LOCATIONS AND SIZES OF SUCH A CUTTING AND DRILLING FOR APPROVAL. CONTRACTOR SHALL COORDINATE ALL WORK PERFORMED BY OTHERS WITH GENERAL CONTRACTOR.
- CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE SITE PRIOR TO SUBMITTING THEIR BID AND TO HAVE EXAMINED AND FAMILIARIZED THEMSELVES WITH THE SITE CONDITIONS. THEY SHALL COMPARE THE DRAWINGS AND SPECIFICATIONS WITH THE RESULTS OF THEIR EXAMINATION OF THE SITE AND CONFIRM THAT ALL REQUIREMENTS FOR COMPLETE H.V.A.C. MAY BE FULFILLED. NO EXTRA PAYMENTS WILL BE ALLOWED TO THE H.V.A.C. CONTRACTOR DUE TO UNFAMILIARITY WITH THE SITE CONDITIONS.
- CONTRACTOR SHALL SUBMIT BID BASED ON THE DRAWINGS, AND PROVIDE ALTERNATE BID FOR VALUE-ENGINEERED COST SAVINGS. CONTRACTOR SHALL EVALUATE DUCT CONSTRUCTION FOR AIR DISTRIBUTION MAIN TRUNKS AND PROVIDE VALUE-ENGINEERED ALTERNATE FOR COST SAVINGS TO THE OWNER.
- THE TENANT RESERVES THE RIGHT TO ACCEPT AND/OR REJECT ANY OR ALL BIDS.
- TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE MATERIALS BEFORE, DURING, AND AFTER INSTALLATION. IN THE EVENT OF DAMAGE, IMMEDIATELY REPAIR ALL DAMAGED AND DEFECTIVE WORK TO THE APPROVAL OF THE ARCHITECT AT NO ADDITIONAL COST TO THE OWNER.
- AS BUILT DRAWINGS SHOWING DIMENSIONS AND LOCATIONS OF PIPES, DUCTS, AND EQUIPMENT SHALL BE SUBMITTED TO THE ARCHITECT, ENGINEER, TENANT, AND OWNER AT CONCLUSION OF CONSTRUCTION.
- THE ARCHITECT/ENGINEER SHALL HAVE THE RIGHT TO ACCEPT AND/OR REJECT MATERIALS, EQUIPMENT, AND/OR WORKMANSHIP, AND SHALL APPROVE ONLY WHEN THE CONTRACTOR HAS COMPLIED WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ARCHITECT/ENGINEER FOR APPROVAL PRIOR TO ORDERING OR INSTALLING EQUIPMENT OR MATERIALS. SHOP DRAWINGS SHALL CLEARLY IDENTIFY SUBSTITUTIONS ON EQUIPMENT AND MATERIALS, AND SHALL CLEARLY IDENTIFY ALL PERTINENT DATA TO SUBSTANTIATE THE EQUALITY OF THE PRODUCT. THIS CONTRACTOR SHALL SUBMIT TO-SCALE DUCTWORK SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO FABRICATION.
- WORKMANSHIP SHALL BE OF THE BEST QUALITY AND ONLY COMPETENT MECHANICS, SKILLED IN THEIR RESPECTIVE TRADES, SHALL BE EMPLOYED.
- THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THEIR WORK WITH ALL OTHER TRADES. THIS INCLUDES COORDINATING THE LOCATION AND SIZE OF ALL OPENINGS, LOCATIONS OF EQUIPMENT, PADS, AND CHANGES IN ELEVATION OF DUCTWORK, PIPING, AND OTHER EQUIPMENT.
- ALL MECHANICAL TRIM/FINISHES SHALL BE COLORED AS PER ARCHITECT REQUIREMENTS. CONTRACTOR SHALL VERIFY COLOR REQUIREMENTS WITH THE ARCHITECT PRIOR TO ORDERING AIR INLETS/OUTLETS, WALL LOUVERS, AND THERMOSTATS.
- COORDINATE THE LOCATIONS OF ALL CEILING DIFFUSERS, REGISTERS, AND GRILLES WITH THE ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL LIGHTING LAYOUT, AND ARCHITECTURAL ROOM ELEVATIONS.
- FIELD-BUILT SLEEPERS OR PLATFORMS FOR ROOF-MOUNTED EQUIPMENT, ROOF PENETRATIONS, CUTTING, AND PATCHING BY GENERAL CONTRACTOR.
- LINE VOLTAGE WIRING, CONDUIT, DISCONNECT SWITCHES, AND FINAL TERMINATIONS BY ELECTRICAL CONTRACTOR. LOW VOLTAGE WIRING, CONDUIT, AND FINAL TERMINATIONS BY MECHANICAL CONTRACTOR.
- ALL LINE VOLTAGE CONTROLS INCLUDING STARTERS, RELAYS, CONTACTORS, TRANSFORMERS, ETC. SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
- CONDENSATE DRAIN AND GAS PIPING SHALL BE BY PLUMBING CONTRACTOR.
- CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS AND CONTROL DEVICES FOR THE COMPLETE INSTALLATIONS OF AN AUTOMATIC TEMPERATURE CONTROL SYSTEM.
- CONTRACTOR SHALL INSTALL ROOFTOP EQUIPMENT AT A MINIMUM OF 10 FEET FROM ANY EDGE OF THE BUILDING WHEN PARAPET WALLS ARE LOWER THAN 42" ABOVE ROOF DECK. WHERE SUCH INSTALLATION IS NOT POSSIBLE, CONTRACTOR SHALL PROVIDE A 42" HIGH SAFETY RAIL.
- ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. PROVIDE ALL FITTINGS, TRANSITIONS, DAMPERS, VALVES, AND OTHER DEVICES REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.
- ALL NEW H.V.A.C. EQUIPMENT, DUCTWORK, PIPING, VALVES, AND CONTROL COMPONENTS SHALL BE PLACED AND LABELED WITH A PERMANENT LAMINATED PLASTIC LABEL. SUBMIT LABELING TO ENGINEER FOR APPROVAL AS A FORMAL SUBMITTAL.
- CONNECT MAIN DUCT TO AIR CONDITIONING UNIT WITH WEATHERPROOF FLEXIBLE CONNECTION. PROVIDE SUN SHIELD OVER ENTIRE FLEXIBLE CONNECTION IF EXPOSED TO WEATHER. FLEXIBLE CONNECTIONS SHALL BE 12" IN LENGTH.
- CONTRACTOR SHALL FURNISH TO TENANT AND PLACE INTO STORAGE FOR TENANT ONE COMPLETE SET OF REPLACEMENT FILTERS AND DRIVE BELTS FOR ALL NEW H.V.A.C. EQUIPMENT ON THIS PROJECT.
- FURNISH AND INSTALL FIRE, SMOKE, OR COMBINATION FIRE/SMOKE DAMPERS WHERE SHOWN ON PLANS OR AS REQUIRED FOR A COMPLETE INSTALLATION. CONTRACTOR SHALL COORDINATE WITH FIRE-RATED CEILING AREAS AND WALLS AS INDICATED ON ARCHITECTURAL DRAWINGS AND LOCAL CODE REQUIREMENTS. THIS NOTE SHALL TAKE PRECEDENCE OVER ANY OMISSIONS ON THE DRAWINGS.
- CONTRACTOR SHALL FURNISH AND INSTALL DUCT ACCESS DOORS AND CEILING ACCESS PANELS AT LOCATIONS AS NECESSARY TO SERVICE DAMPERS TO PROVIDE MAINTENANCE FOR EQUIPMENT. ALL CEILING ACCESS PANEL LOCATIONS SHALL BE VERIFIED WITH THE ARCHITECT PRIOR TO INSTALLATION.
- CONTRACTOR SHALL PROVIDE & INSTALL DUCT MOUNTED SMOKE DETECTORS IN AIR DISTRIBUTION SYSTEMS WHERE AIRFLOW IS GREATER THAN 2000 CFM. MECHANICAL CONTRACTOR SHALL WIRE DUCT SMOKE DETECTOR TO SHUT DOWN FAN, AND ELECTRICAL/FIRE ALARM CONTRACTOR SHALL WIRE IT TO THE FIRE ALARM SYSTEM FOR SUPERVISION AND SHUTDOWN.
- CONTRACTOR SHALL FURNISH AND INSTALL SUPPORTS, HANGERS, UPPER & LOWER ATTACHMENTS, AND ANCHORS REQUIRED TO INSTALL ALL MATERIALS AND EQUIPMENT FURNISHED AND INSTALLED UNDER THIS CONTRACT. DUCTWORK AND PIPING SHALL NOT BE SUPPORTED FROM THE ROOF DECK. UPPER ATTACHMENTS FOR HANGING DUCT SHALL BE SUPPORTED FROM BEAMS, JOISTS OR SUPPLEMENTARY STRUCTURAL MEMBERS PROVIDED BY MECHANICAL CONTRACTOR.
- PROVIDE TURNING VANES AT ALL MITERED ELBOWS, OPPOSED BLADE BALANCING DAMPERS WITH LOCKING QUADRANTS AT BRANCH DUCTS, VOLUME DAMPERS, SPLITTER DAMPERS, AND ANY OTHER APPLICABLE DEVICES NECESSARY FOR MINIMUM DUCT RESISTANCE AND PROPER AIR BALANCING. ALL DAMPERS OR SPLITTERS SHALL BE SUFFICIENTLY STIFFENED TO PREVENT NOISE OR VIBRATION AND SHALL BE FITTED WITH AN ACCESSIBLY-LOCATED ADJUSTER.
- CONTRACTOR SHALL FURNISH AND INSTALL DAMPERS, LINKAGES, AND ACTUATORS REQUIRED FOR AIR FLOW CONTROL SYSTEM. DAMPERS SHALL BE OPPOSED BLADE WITH RUBBER GASKETS. ACTUATORS SHALL BE "BELIMO" NO-LINKAGE TYPE OR "HONEYWELL" WITH LINKAGE. ACTUATOR MOTORS SHALL BE 24VOLT WITH SPRING RETURN AND MANUAL OVERRIDE FOR EMERGENCY.
- ALL DUCT SIZES ARE CLEAR INSIDE DIMENSIONS. DUCTWORK SHALL BE INSULATED OR LINED AS SHOWN ON DRAWINGS. ALL DUCTWORK EXPOSED ON ROOF SHALL BE INTERNALLY LINED UNLESS OTHERWISE INDICATED OR SPECIFIED.
- ALL SUPPLY AND RETURN AIR DUCTWORK CONCEALED ABOVE CEILINGS SHALL BE INSULATED AND WRAPPED WITH TWO INCH FIBERGLASS INSULATION WITH FOIL FACED VAPOR BARRIER. REFRIGERANT SUCTION PIPING SHALL BE INSULATED WITH ARMAFLEX AND JACKETED WHEN EXPOSED TO THE OUTDOORS. CONDENSATE DRAIN PIPING SHALL BE INSULATED WITH ARMAFLEX.
- CONTRACTOR TO PROVIDE 1" ACOUSTICAL FIBERGLASS DUCT LINER FOR APPROXIMATELY 10'-0" FROM UNITS ON BOTH SUPPLY AND RETURN DUCTS.
- ROUND AND RECTANGULAR DUCTWORK ARE INTERCHANGEABLE TO AVOID OBSTRUCTIONS IF CROSS-SECTIONAL AREAS ARE EQUIVALENT. CONTRACTOR IS TO VERIFY THE EXACT AVAILABLE CEILING SPACE AND INTERCHANGE THE DUCT SIZE TO FIT THE CEILING SPACE WITHOUT ADDITIONAL COST.
- INSTALL VOLUME CONTROL DAMPERS AT EACH SUPPLY DIFFUSER AND WHERE NECESSARY TO CONTROL AIR FLOW IN THE DUCT SYSTEMS.
- EXHAUST TERMINATIONS SHALL BE MINIMUM 10'-0" AWAY FROM OR 3'-0" ABOVE ANY FRESH AIR INTAKE, OPERABLE WINDOWS, AND DOORS, AND MINIMUM 10'-0" ABOVE GRADE.
- PROVIDE BACKDRAFT DAMPER FOR ALL EXHAUST AIR INLETS UNLESS OTHERWISE NOTED PER CODE.
- PROVIDE ALL FRESH AIR INTAKES AND EXHAUST OUTLETS WITH HOOD WITH 1/4" GALVANIZED MESH SCREENS.
- ALL CEILING DIFFUSERS ARE 4-WAY UNLESS OTHERWISE NOTED. DIFFUSERS AND REGISTERS SHALL BE TITUS, KRUEGER, ADP, METALAIR, ANEMOSTAT OR EQUAL.
- ALL EXPOSED MATERIALS WITHIN A RETURN AIR PLENUM SHALL BE NON-COMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE-DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E 84.
- CONTRACTOR IS RESPONSIBLE FOR SIZING REFRIGERANT LINES PER MANUFACTURER'S RECOMMENDATIONS; FIELD MEASURED TOTAL EQUIVALENT LENGTHS, AND VERTICAL LIFTS, AND PROVIDE ALL NECESSARY COMPONENTS.
- ALL MATERIALS AND EQUIPMENT PROVIDED AND/OR INSTALLED UNDER THIS CONTRACT SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM THE DATE OF BENEFICIAL OCCUPANCY. ANY DEFECTS IN MATERIALS AND/OR WORKMANSHIP OCCURRING DURING TIME PERIOD SHALL BE REPAIRED OR REPLACED BY THIS CONTRACTOR AT NO COST TO THE OWNER. WARRANTY FOR COMPRESSORS SHALL BE (5) YEARS, AND WARRANTY FOR HEAT EXCHANGERS SHALL BE (10) YEARS.
- CONTRACTOR SHALL SUBMIT A COMPLETE BALANCE REPORT FOR APPROVAL. THE REPORT SHALL INCLUDE THE REQUIREMENTS DESCRIBED IN THE TEST AND BALANCE SPECIFICATION SECTION. CONTRACTOR SHALL FURNISH SEPARATE BALANCE REPORTS FOR GENERAL H.V.A.C. SYSTEMS AND KITCHEN EXHAUST/MAKEUP AIR SYSTEMS, IF APPLICABLE. THERE SHOULD BE NO OUTSTANDING ITEMS ON THE REPORTS PRIOR TO CITY FINAL INSPECTION.

GREEN BUILDING NOTES

- TESTING AND ADJUSTING OF NEW SYSTEMS INSTALLED TO SERVE AN ADDITION OR ALTERATION SUBJECT TO SECTION 5.410.4 SHALL BE REQUIRED.
- TEMPORARY VENTILATION: IF THE HVAC SYSTEM IS USED DURING CONSTRUCTION USE RETURN AIR FILTERS WITH A MERV OF 8, BASED ON ASHRAE 52.2-1999, OR AN AVERAGE EFFICIENCY OF 30% BASED ON ASHRAE 52.1-1192. REPLACE ALL FILTER IMMEDIATELY PRIOR TO OCCUPANCY.
- AT THE TIME OF ROUGH INSTALLATION OR DURING STORAGE ON THE CONSTRUCTION SITE AND UNTIL START-UP OF THE HEATING AND COOLING EQUIPMENT, ALL DUCTS AND OTHER RELATED AIR DISTRIBUTION COMPONENT EQUIPMENT SHALL BE COVERED WITH TAPE, PLASTIC, SHEETMETAL OR OTHER METHODS ACCEPTABLE TO THE ENFORCING AGENCY TO REDUCE THE AMOUNT OF DUST OR DEBRIS WHICH MAY COLLECT IN THE SYSTEM.
- ADHESIVES, SEALANTS, AND CAULKS USED IN THE PROJECT SHALL MEET THE REQUIREMENTS OF THE FOLLOWING STANDARDS:
 - ADHESIVES, ADHESIVE BONDING PRIMERS, ADHESIVE PRIMERS, SEALANTS, SEALANT PRIMERS AND CAULKS SHALL COMPLY WITH LOCAL OR REGIONAL AIR POLLUTION CONTROL OR AIR QUALITY MANAGEMENT DISTRICT RULES WHERE APPLICABLE OR SCAGMCD RULE 1.168 VOC LIMITS, AS SHOWN IN TABLES 5.504.1 AND 5.504.2.
 - AEROSOL ADHESIVES AND SMALLER UNIT SIZES OF ADHESIVES AND SEALANT OR CAULKING COMPOUNDS (IN UNITS OF PRODUCT, LESS PACKAGING, WHICH DO NOT WEIGH MORE THAN ONE POUND AND DO NOT CONSIST OF MORE THAN 16 FLUID OUNCES) SHALL COMPLY WITH STATEWIDE VOC STANDARDS AND OTHER REQUIREMENTS, INCLUDING PROHIBITIONS ON USE OF CERTAIN TOXIC COMPOUNDS, OF CALIFORNIA CODE OF REGULATIONS, TITLE 17, COMMENCING WITH SECTION 94507.0
- IN MECHANICAL VENTILATED BUILDINGS, PROVIDE REGULARLY OCCUPIED AREAS OF THE BUILDING WITH AIR FILTRATION MEDIA FOR OUTSIDE AND RETURN AIR PRIOR TO OCCUPANCY THAT PROVIDES AT LEAST A MERV 8.
- MECHANICAL VENTILATION SHALL BE CALCULATED PER SECTION 120.1 OF THE CALIFORNIA ENERGY CODE, OR THE APPLICABLE LOCAL CODE, WHICHEVER IS MORE STRINGENT, AND DIVISION 1, CHAPTER 4 OF CCR, TITLE 8.
- FOR BUILDINGS EQUIPPED WITH DEMAND CONTROL VENTILATION, CO2 SENSORS AND VENTILATION CONTROLS SHALL BE SPECIFIED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA ENERGY CODE, SECTION 120(C).
- HVAC, REFRIGERATION, AND FIRE-SUPPRESSION EQUIPMENT SHALL NOT CONTAIN CFCs OR HALON.

LEGEND

| | |
|--------|--|
| PD | PRESSURE DROP |
| PH | PHASE |
| POC | POINT OF CONNECTION |
| PPM | PARTS PER MILLION |
| PREFAB | PRE-FABRICATED |
| PRV | PRESSURE REDUCING VALVE, POWER ROOF VENTILATOR |
| PSI | POUNDS PER SQUARE INCH |
| PTAC | PACKAGED TERMINAL AIR CONDITIONER |
| R | THERMAL RESISTANCE |
| RH | RELATIVE HUMIDITY |
| RHC | REHEAT COIL |
| RM | ROOM |
| RPM | REVOLUTION PER MINUTE |
| RTU | ROOF TOP UNIT |
| REV | REVOLUTION, REVISION |
| RV | RELIEF VALVE |
| SIS | STAINLESS STEEL |
| SENS | SENSIBLE |
| SF | SAFETY FACTOR |
| SMK | SMOKE |
| STN | STRAINER |
| TCV | TEMPERATURE CONTROL VALVE |
| TDV | TRIPLE DUTY VALVE |
| TEMP | TEMPERATURE |
| TONS | TONS OF REFRIGERATION |
| TSTAT | THERMOSTAT |
| TYP | TYPICAL |
| UON | UNLESS OTHERWISE NOTED |
| V | VOLTS |
| VAV | VARIABLE AIR VOLUME |
| VSC | VARIABLE SPEED CONTROLLER |
| VVT | VARIABLE VOLUME TERMINAL |
| WB | WET BULB TEMPERATURE |
| WT | WEIGHT |

EXISTING CONDITIONS/SCOPE NOTES

CONTRACTOR SHALL CLOSELY INSPECT AND VERIFY ALL EXISTING CONDITIONS AND INCLUDE IN BID ALL WORK REQUIRED TO DELIVER DESIGN INTENT. COORDINATE ALL ROOF-TO-SPACE PENETRATIONS WITH LANDLORD AND REQUEST ADDITIONAL SHELL INFORMATION FROM LANDLORD AS NECESSARY. NO CHANGE ORDER WILL BE ALLOWED.

DAMPER CONTROL

DAMPERS FOR OUTDOOR AIR SUPPLY AND EXHAUST SHALL AUTOMATICALLY SHUT WHEN THE SYSTEM OR SPACES SERVED ARE NOT IN USE OR DURING BUILDING WARMUP, COOL-DOWN, AND SETBACK. OPERATION OF DAMPERS SHALL BE ALLOWED DURING VENTILATION PREPURGE ONE HOUR BEFORE EXPECTED OCCUPANCY AND FOR UNOCCUPIED PERIOD PRE-COOLING DURING THE COOLING SEASON.

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| M-012 | MECHANICAL SPECIFICATIONS |
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| M-501 | HOOD DETAILS |
| M-502 | HOOD DETAILS |
| M-503 | HOOD DETAILS |
| M-504 | HOOD DETAILS |
| M-505 | HOOD DETAILS |

LEGEND

| SYMBOL & ABBREVIATION | DESCRIPTION |
|-----------------------|--|
| COEFF | COEFFICIENT |
| COL | COLUMN |
| COND | CONDENSER, CONDENSING |
| CONT | CONTINUOUS |
| COP | COEFFICIENT OF PERFORMANCE (HEATING) |
| COP | COOLING COIL PUMP |
| CP | CONDENSATE PUMP |
| CT | COOLING TOWER |
| CTR | COOLING TOWER RETURN |
| CTS | COOLING TOWER SUPPLY |
| CU | CONDENSING UNIT |
| CW | COLD WATER |
| CWP | COLD WATER PUMP |
| CWR | COLD WATER RETURN |
| CWS | COLD WATER SUPPLY |
| dB | DECIBEL |
| DB | DRY BULB TEMPERATURE |
| DCV | DEMAND CONTROLLED VENTILATION |
| DDC | DIRECT DIGITAL CONTROL |
| DEG | DEGREE |
| DEPT | DEPARTMENT |
| DET | DETAIL |
| DH | DUCT HEATER |
| DIA | DIAMETER |
| DISC | DISCONNECT |
| DISCH | DISCHARGE |
| DPS | DIFFERENTIAL PRESSURE SENSOR |
| DR | DRAIN |
| DWG | DRAWING |
| EAT | ENTERING AIR TEMPERATURE |
| EC | ELECTRICAL CONTRACTOR |
| ECON | ECONOMIZER |
| EER | ENERGY EFFICIENCY RATIO |
| EF | EXHAUST FAN |
| (E) | EXISTING |
| EFF | EFFICIENCY |
| EQUIP | EQUIPMENT |
| ESP | EXTERNAL STATIC PRESSURE |
| ET | EXPANSION TANK |
| EH | ELECTRIC HEATER |
| EXH | EXHAUST |
| EXIST | EXISTING |
| EXP | EXPANSION |
| EXT | EXTERIOR |
| FC | FAN COIL UNIT |
| FD | FIRE DAMPER |
| FLEX | FLEXIBLE |
| FLR | FLOOR |
| FLTR | FILTER |
| PPM | FEET PER MINUTE |
| FPT | FAN POWERED TERMINAL |
| FSD | FIRE SMOKE DAMPER |
| FSS | FLOW SENSING SWITCH |
| FURN, FAU | FURNACE AIR UNIT |
| GA | GAGE/GAUGE |
| GC | GENERAL CONTRACTOR |
| HP | HEAT PUMP |
| HSTAT | HUMIDISTAT |
| HVAC | HEATING, VENTILATING, AND AIR CONDITIONING |
| HW | HOT WATER |
| HWP | HOT WATER PUMP |
| HWR | HOT WATER RETURN |
| HWS | HOT WATER SUPPLY |
| HWT | HOT WATER TANK |
| HZ | FREQUENCY |
| ID | INSIDE DIAMETER |
| IN WC | INCHES, WATER COLUMN |
| KW | KILOWATT |
| LAT | LEAVING AIR TEMPERATURE |
| LVR | LOUVER |
| LWT | LEAVING WATER TEMPERATURE |
| MCA | MINIMUM CIRCUIT AMPACITY |
| MFR | MANUFACTURER |
| MECH | MECHANICAL |
| MOC | MAXIMUM OVERCURRENT PROTECTION |
| (N) | NEW |
| NA | NOT APPLICABLE |
| NC | NOISE CRITERIA, NORMALLY CLOSED |
| NIC | NOT IN CONTRACT |
| NTS | NOT TO SCALE |
| O/OSA | OUTSIDE AIR |
| OBD | OPPOSED BLADE DAMPER |
| OD | OUTSIDE DIAMETER |
| P | PUMP |

LEGEND

| SYMBOL & ABBREVIATION | DESCRIPTION |
|-----------------------|--|
| SA/SUP | SUPPLY AIR (RISE/DROP) |
| RA/RET | RETURN AIR DUCT (RISE/DROP) |
| E/EXH | EXHAUST AIR DUCT (RISE/DROP) |
| CD/SR | CEILING DIFFUSER/SUPPLY REGISTER (ARROWHEAD REPRESENTS NUMBER OF THROW) (4-WAY TYPICAL IF NO ARROWS) |
| RR/RG | RETURN REGISTER/GRILLE |
| ER/EG | EXHAUST REGISTER/GRILLE |
| | RECTANGULAR DUCT ELBOW WITH TURNING VANES |
| FC | FLEXIBLE CONNECTION |
| MVD | MANUAL VOLUME DAMPER |
| FD | FIRE DAMPER |
| (L) | DUCT LINING (1" THICK UNLESS OTHERWISE NOTED) |
| | SINGLE LINE DUCT BRANCH TAKE-OFF |
| | DUCT TRANSITION (RECTANGULAR TO ROUND) |
| FLEX | FLEXIBLE DUCT |
| T-STAT | PROGRAMMABLE THERMOSTAT |
| SD | DUCT SMOKE DETECTOR |
| FD | FIRE DAMPER |
| FSD | COMBINATION FIRE/SMOKE DAMPER |
| ZD | ZONE DAMPER |
| CD | CONDENSATE DRAIN |
| DIA | DIAMETER |
| DL | DOOR LOUVER |
| UC | DOOR UNDERCUT (3/4" MINIMUM) |
| POC | POINT OF CONNECTION |
| (M) | FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR. |
| (E) | FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR. |
| (ME) | FURNISHED BY MECHANICAL CONTRACTOR AND INSTALLED BY ELECTRICAL CONTRACTOR. |
| SD-1 | (SD-SUPPLY DIFFUSER, RD-RETURN DIFFUSER, E-EXHAUST) |
| 100 | AIR QUANTITY IN CFM |
| AC | MECHANICAL EQUIPMENT DESIGNATION |
| 1 | DESIGNATED NUMBER |
| AC, AC, ACU | AIR CONDITIONING UNIT |
| ADD | ADDITION |
| ADJ | ADJUSTABLE |
| AFF | ABOVE FINISHED FLOOR |
| AFS | AIR FLOW SENSOR |
| AHU | AIR HANDLER UNIT |
| ALT | ALTERNATE |
| AMB | AMBIENT |
| AMP | AMPERE |
| ANSI | AMERICAN NATIONAL STANDARDS INSTITUTE |
| AP | ACCESS PANEL |
| AS | AIR SEPARATOR |
| AV | AIR VENT |
| BAPR | BAROMETRIC PRESSURE |
| BARO | BAROMETER |
| BBD | BOILER BLOW DOWN |
| BCV | BUTTERFLY CHECK VALVE |
| BDD | BACK DRAFT DAMPER |
| BFP | BACK FLOW PREVENTER |
| BFV | BACK FLOW VALVE |
| BHP | BRAKE HORSEPOWER |
| BLDG | BUILDING |
| BLR | BOILER |
| BP | BOILING POINT |
| BTU | BRITISH THERMAL UNIT |
| BV | BALL VALVE |
| BYP | BY PASS |
| CA | COMPRESSED AIR |
| CAV | CONSTANT AIR VOLUME |
| CB | CIRCUIT BREAKER |
| CC, CC | COOLING COIL |
| CLG | CONDENSATE DRAIN |
| CLG | CEILING |
| CO2 | CARBON DIOXIDE |
| CONN. | CONNECT/CONNECTION |
| CONT. | CONTINUATION |
| CONTR | CONTRACTOR |
| CFM | CUBIC FEET PER MINUTE |
| CH | CHILLER |
| CHKV | CHECK VALVE |
| CHWP | CHILLED WATER PUMP |
| CHWR | CHILLED WATER RETURN |
| CHWS | CHILLED WATER SUPPLY |
| CKT | CIRCUIT |
| CLG | CEILING |
| CO | CARBON MONOXIDE, CLEAN-OUT |
| CO2 | CARBON DIOXIDE |



sweetgreen
3000 S. ROBERTSON BLVD.
LOS ANGELES, CALIFORNIA 90034

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ARCHITECT OF RECORD:
Dewberry
Dewberry Architects Inc.
300 N. Lake Ave., 12th Floor
Pasadena, Ca. 91101
916.239.4256 Phone
916.239.7245 Fax

STAMP:
ACIES ENGINEERING
400 N. McCarthy Blvd., Ste 200
Milpitas, CA 95035
ph: (408) 522-5255
fx: (408) 522-5260
info@acies.net
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PROJECT INFORMATION:
DEL AMO
PROJECT INFORMATION:
**21434 HAWTHORNE BLVD
SUITE 605A
TORRANCE, CA 90503**

DRAWN BY: ACIES
CHECKED BY: GP/DY
PROJECT MANAGER: EN
SG DESIGN MANAGER: XX
SG CONSTR. MANAGER: XX
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| REV. | DATE | DESCRIPTION |
|------|----------|-------------------|
| A | 10/25/21 | PERMIT SET |
| B | 01/21/22 | PERMIT RESPONSE 1 |
| C | 03/25/22 | IFC |
| B | 05/04/22 | BULLETIN 1 |
| D | 06/30/22 | KITCHEN UPDATES |

MECHANICAL LEGEND, NOTES, AND ABBREVIATIONS

M-010

MECHANICAL SPECIFICATION

SECTION 1500 - HEATING, VENTILATION AND AIR CONDITIONING

1.00 - GENERAL

1.01 DESCRIPTION OF WORK

FURNISH AND INSTALL COMPLETE AND OPERATIONAL HVAC SYSTEM AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN. WORK SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:

- A. PACKAGED HEATING & COOLING ROOFTOP UNITS.
B. POWER VENTILATORS.
C. AIR DISTRIBUTION METAL DUCTS.
D. HYDRONIC PIPING.
E. HANGERS AND SUPPORTS FOR DUCTWORK, PIPING AND HVAC EQUIPMENT.
F. THERMAL AND ACOUSTIC INSULATION.
G. SEISMIC RESTRAINTS AND BRACING.
H. AUTOMATIC TEMPERATURE CONTROL SYSTEM.

1.02 DEMOLITION AND REMOVAL OF EXISTING HVAC EQUIPMENT AS REQUIRED.

1.03 RELATED WORK INCLUDED UNDER OTHER SECTIONS

- A. FIRE PROTECTION, SECTION 15300.
B. PLUMBING, SECTION 15400.
C. LINE VOLTAGE AND POWER WIRING, ELECTRICAL SECTION 16000.

1.03 EXAMINATION OF SITE

VISIT SITE BEFORE SUBMITTING BID AND CHECK LOCATION OF ALL EXISTING CONDITIONS WHICH WILL AFFECT THIS WORK. VERIFY DIMENSIONS AND LOCATIONS SHOWN ON DRAWINGS AND COVER ALL COSTS. CONTRACTOR SHALL ASSUME REASONABLE VARIATIONS OR MINOR OMISSIONS AND SHALL COMPLETE PROPOSED WORK WITHOUT ADDITIONAL COST. FAILURE TO VISIT SITE WILL NOT LESSEN RESPONSIBILITY OR ENTITLE ADDITIONAL COMPENSATION FOR WORK NOT INCLUDED IN PROPOSAL.

1.04 DRAWINGS

THE ACCOMPANYING DRAWINGS SHALL BE CONSIDERED PART OF THESE SPECIFICATIONS. WORK AND MATERIALS SHOWN ON THE DRAWINGS AND NOT MENTIONED IN THE SPECIFICATIONS AND VICE VERSA SHALL BE EXECUTED AS IF SPECIFICALLY MENTIONED OR SHOWN IN BOTH. THE DRAWINGS SHALL BE CONSIDERED AS SCHEMATIC IN NATURE AND MINOR MODIFICATIONS OF THE WORK TO COMPLY WITH THE STRUCTURE AS FOUND SHALL BE MADE.

1.05 RULES AND REGULATIONS

- A. ALL WORK AND MATERIAL SHALL BE IN FULL ACCORDANCE WITH THE LATEST RULES AND REGULATIONS OF THE STATE FIRE MARSHAL AND OTHER APPLICABLE STATE AND LOCAL RULES AND REGULATIONS.
B. NOTHING IN THESE DRAWINGS OR SPECIFICATIONS SHALL BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.
C. FURNISH WITHOUT ANY EXTRA CHARGE ANY ADDITIONAL MATERIAL AND LABOR WHEN REQUIRED TO COMPLY WITH THESE LAWS, ORDINANCES AND CODES REGARDLESS OF WHETHER SHOWN OR MENTIONED IN THESE SPECIFICATIONS OF DRAWINGS.

1.06 SUBMITTALS

- A. SUBMIT FOR REVIEW A COMPLETE AND ALL-INCLUSIVE LIST OF EQUIPMENT AND MATERIALS PROPOSED FOR USE. (1) SOFT COPY, ACCOMPANIED BY MANUFACTURER'S DATA SHEETS. DATA SHALL BE FORWARDED IN A SINGLE PACKAGE WITHIN 15 DAYS AFTER AWARD OF CONTRACT. SUBMIT PORTABLE DOCUMENT FORMAT (PDF) AND ONE REPRODUCIBLE SHOP DRAWING SHOWING PROPOSED DUCTWORK INSTALLATION. INCLUDE SIZES, LOCATIONS AND OTHER REQUIRED INFORMATION TO COORDINATE INSTALLATION WITH OTHER TRADES.
B. WITHIN 5 DAYS AFTER AWARD OF CONTRACT, SUBMIT PDF & A COPY OF A LETTER STATING ANY MATERIALS THAT CONTRACTOR WISHES TO SUBSTITUTE, TO THE OWNER FOR APPROVAL. INCLUDE SUCH INFORMATION AS MANUFACTURER'S NAME, TYPE OF MATERIAL, CERTIFIED RATINGS, OVERALL APPEARANCE, AND NECESSARY INFORMATION TO EXPLAIN FUNCTION AND OPERATION OF MATERIAL. ALL PROPOSED SUBSTITUTIONS SHALL BE EQUAL IN QUALITY, DESIGN, UTILITY AND APPEARANCE TO MATERIAL, EQUIPMENT OR METHOD SPECIFIED.

1.07 AS-BUILT DRAWINGS

A SET OF HVAC PRINTS OR ACCESS TO A PRINT SHOP/PDF'S WILL BE FURNISHED TO THE CONTRACTOR ON WHICH HE/SHE SHALL INDICATE THE INSTALLATION "AS-BUILT" AS THE WORK PROGRESSES. UPON COMPLETION OF THE WORK, A SET OF REPRODUCIBLE DRAWINGS SHALL BE OBTAINED FROM THE OWNER AT COST, AND ALL CHANGES AS NOTED ON THE RECORD SET OF PRINTS SHALL BE INCORPORATED THEREON. THIS SET OF REPRODUCIBLES, ALONG WITH ONE SET OF PDF'S, SHALL BE DELIVERED TO THE OWNER UPON COMPLETION AND BEFORE FINAL ACCEPTANCE OF THE PROJECT.

1.08 GUARANTEE

THE CONTRACTOR SHALL LEAVE THE ENTIRE INSTALLATION IN COMPLETE WORKING ORDER FREE FROM ANY DEFECTIVE MATERIAL, WORKMANSHIP OR FINISH. HE SHALL GUARANTEE TO REPAIR OR REPLACE, WITHOUT CHARGE, DEFECTS DUE TO FAULTY WORKMANSHIP OR MATERIAL FOR A PERIOD OF ONE YEAR FROM THE DATE OF FILING OF THE NOTICE OF COMPLETION.

1.09 OPERATION MANUALS AND OWNER INSTRUCTIONS

- A. PROVIDE COMPLETE OPERATION AND MAINTENANCE MANUALS COVERING ALL MECHANICAL SYSTEMS AND EQUIPMENT THAT HAVE BEEN INSTALLED. A HARD COPY & SOFT COPY OF THE MANUAL SHALL BE PROVIDED TO AN OWNER.
B. PROVIDE INSTRUCTIONS TO STORE PERSONNEL AS TO OPERATION OF ALL HVAC EQUIPMENT AND THERMOSTATS. INSTRUCTION PERIOD TO COMMENCE FOR MINIMUM OF (2) HOURS AND SHALL BE SCHEDULED AT OWNER'S CONVENIENCE. ALSO, PROVIDE STORE MANAGER WITH OPERATION MANUAL.

1.10 CUTTING AND PATCHING

- A. CONTRACTOR SHALL DO ALL CUTTING, DRILLING AND PATCHING WHICH MAY BE REQUIRED FOR THE INSTALLATION OF THE WORK UNDER THIS SECTION OF THE SPECIFICATIONS.
B. PATCHING SHALL BE OF THE SAME WORKMANSHIP, MATERIAL, AND FINISH AND SHALL MATCH ACCURATELY ALL SURROUNDING CONSTRUCTION IN A MANNER SATISFACTORY TO THE OWNER. NO CUTTING OF THE STRUCTURE SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE OWNER AND THE ARCHITECT.

2.00 - DUCTWORK

2.01 MATERIALS

2.01.1 METAL AIR DUCTS

- A. SHEET METAL RECTANGULAR AND ROUND DUCTWORK, PLENUMS, AND CASINGS SHALL BE FABRICATED IN STRICT ACCORDANCE WITH LATEST EDITION OF SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" BASED ON INDICATED STATIC-PRESSURE CLASS.

B. MATERIAL FOR DUCTWORK SHALL BE HOT DIPPED GALVANIZED (G60) STEEL OF GAUGES SHOWN IN THE SMACNA HVAC DUCT CONSTRUCTION STANDARDS. ALL DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH PRESSURE CLASSIFICATION SCHEDULES OF NO LESS THAN CLASS +1/2" W.G., AND SHALL BE SEALED TO THE DUCT SEALING REQUIREMENTS OF CLASS "C" MINIMUM.

- C. SELECT TRANSVERSE JOINT AND LONGITUDINAL SEAM TYPES, FIGURES 1-4 AND 1-5 RESPECTIVELY, AND FABRICATE RECTANGULAR DUCTWORK ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE".
D. SELECT ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, TEES AND LATERALS, AND OTHER FITTING TYPES, AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE".
E. TRANSITIONS IN SIZE OF DUCTS SHALL BE MADE BY UNIFORMLY TAPERING SECTIONS HAVING 1 INCH INCREASE IN WIDTH FOR EACH 7 INCHES OF RUN UNLESS CONSTRUCTION LIMITATIONS REQUIRE A MORE ABRUPT TRANSITION.
F. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE", CHAPTER 4, "HANGERS AND SUPPORTS" FOR UPPER AND LOWER ATTACHMENTS, FIGURES 4.2 AND 4.4 RESPECTIVELY. REFER TO TABLES 4.1 AND 4.2 FOR RECTANGULAR AND ROUND MINIMUM HANGER SIZE AND SPACING.
G. SHEET METAL ROUND DUCT SHALL BE UNITED MCGILL, SEMCO INC., LNX IND., OR EQUAL SPIRAL SEAM DUCTS WITH GASKET "UNISEAL" CONNECTION FOR EXPOSED INSTALLATIONS, AND SPIRAL OR LONGITUDINAL SEAM WITH BEADED SLEEVE JOINT CONNECTIONS FOR CONCEALED INSTALLATIONS. FITTINGS SHALL BE "UNIFORM" MACHINE FORMED WITH CONTINUOUS WELDS.
H. SUPPLY AND RETURN AIR DUCTWORK SHALL BE EXTERNALLY INSULATED AS REQUIRED BY LOCAL ENERGY CODE. INSULATION SHALL BE OWENS-CORNING SOFT DUCT WRAP OR EQUAL CONSISTING OF A BLANKET OF GLASS FIBER INSULATION FACTORY-LAMINATED TO FRK VAPOR RETARDER FACING. INSULATION SHALL MEET THE REQUIREMENTS OF NFPA 90A AND 90 B AND OTHER MECHANICAL ENERGY CODES.

2.01.2 FACTORY-MADE AIR DUCTS

- A. FACTORY-MADE AIR DUCTS SHALL BE APPROVED FOR THE USE INTENDED. EACH SECTION OF A FACTORY-MADE AIR DUCT SHALL BE IDENTIFIED BY THE MANUFACTURER WITH A LABEL INDICATING CLASS DESIGNATION. THESE DUCTS SHALL BE LISTED AND SHALL BE INSTALLED IN ACCORDANCE WITH THE TERMS OF THEIR LISTING, AND SHALL BE APPROVED FOR USE WITHOUT LENGTH LIMITATIONS BY THE AUTHORITY HAVING JURISDICTION.
B. ACOUSTICAL FLEXIBLE DUCT SHALL BE UL 181 LISTED, CLASS 1, 2-PLY VINYL FILM SUPPORTED BY HELICALLY WOUND SPRING-STEEL WIRE, FIBROUS-GLASS INSULATION TO MEET LOCAL CODE R-VALUES, AND FINISHED WITH A POLYETHYLENE VAPOR-BARRIER FILM. INTERIOR VINYL FILM SHALL BE PERFORATED FOR SOUND ATTENUATION. FLEXIBLE DUCT SHALL BE RATED TO +107-1/2" W.G., 4000 FPM, AND -20 TO 210°F TEMPERATURE RANGE. FLEXIBLE DUCT CLAMP CONNECTORS SHALL BE STAINLESS-STEEL BAND WITH CADMIUM HEX SCREW TO TIGHTEN BAND WITH A WORM-GEAR ACTION. FLEXIBLE DUCTS SHALL BE ALLOWED ONLY AT THE FINAL CONNECTION TO AIR OUTLETS/INLETS AT A LENGTH OF 5 FEET MAXIMUM.

- C. INSULATED ALUMINUM FLEXIBLE DUCT SHALL BE UL 181 LISTED, CLASS 0, INTERLOCKING SPIRAL OF ALUMINUM FOIL, FIBROUS-GLASS INSULATION SHALL MEET LOCAL CODE R-VALUE, AND SHALL BE FINISHED WITH A POLYETHYLENE VAPOR-BARRIER FILM. ALUMINUM FLEXIBLE DUCT SHALL BE RATED TO +1/8" W.G., 5000 FPM VELOCITY, AND -20 TO 250°F TEMPERATURE RANGE.

- D. INSULATED WIRE FLEXIBLE DUCT SHALL BE UL 181 LISTED, CLASS 1, 2-PLY VINYL FILM SUPPORTED BY HELICALLY WOUND SPRING-STEEL WIRE, FIBROUS-GLASS INSULATION SHALL MEET LOCAL CODE R-VALUES, AND SHALL BE FINISHED WITH A POLYETHYLENE VAPOR-BARRIER FILM. FLEXIBLE DUCTS SHALL BE RATED TO +101-1/2" W.G., 4000 FPM VELOCITY, AND -20 TO 210°F TEMPERATURE RANGE. FLEXIBLE DUCT CLAMP CONNECTORS SHALL BE STAINLESS-STEEL BAND WITH CADMIUM HEX SCREW TO TIGHTEN BAND WITH A WORM-GEAR ACTION.

- E. INSTALLATION OF FACTORY-MADE AIR DUCT JOINTS AND ATTACHMENTS SHALL BE IN STRICT ACCORDANCE WITH LATEST EDITION OF SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE".
F. SELECT TRANSITIONS, BRANCH CONNECTIONS, TEES AND LATERALS, AND OTHER FITTING TYPES, AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" BASED ON INDICATED STATIC-PRESSURE CLASS.

- G. SELECT SIZING PRACTICES IN ACCORDANCE TO THE AIR CONDITIONING CONTRACTORS OF AMERICA (ACCA), MANUALS D & Q. IN PRACTICE LIMIT VELOCITIES TO 700 FPM MAX. FOR SUPPLY AND RETURN AIR DUCTS, AND INCREASE DUCT SIZES BY ONE SIZE (EVEN NUMBER) LARGER THAN METAL AIR DUCTS.

- H. FACTORY-MADE DUCTS SHALL NOT BE USED FOR VERTICAL RISERS IN AIR DISTRIBUTION DUCT SYSTEMS. SUCH A DUCT SHALL NOT PENETRATE CONSTRUCTION WHERE FIRE DAMPERS ARE REQUIRED.

2.01.3 DUCTWORK ACCESSORIES

- A. DAMPER OPERATORS
A.A. DUCTS WITH EXTERNAL INSULATION: VENTLOCK #637, DURADYNE, YOUNG, OR APPROVED EQUAL.
A.B. DUCTS WITH INTERNAL INSULATION AND/OR NO INSULATION: VENTLOCK #635, DURADYNE, YOUNG, OR APPROVED EQUAL.
B. FLEXIBLE CONNECTIONS: VENTFRAS "VENTGLAS", DURADYNE, OR APPROVED EQUAL. U.L. 181 APPROVED WITH METAL ATTACHMENT.
C. AIR EXTRACTOR: TITUS AG-225, KRUEGER EX-88C, OR APPROVED EQUAL.
D. TURNING VANES SHALL COMPLY WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS. ALL RECTANGULAR DUCT WITH MITERED ELBOWS SHALL BE FITTED WITH TURNING VANES.

- E. SPIN-IN-FITTINGS ARE NOT ALLOWED. USE UNITED MCGILL BELLMOUTH FITTING FOR ROUND DUCT TAPS.
F. ACCESS DOORS IN DUCTWORK SHALL BE VENTLOCK, DUCTIMATE OR APPROVED EQUAL, STAMPED OR FORMED INSULATED ACCESS DOORS COMPLETE WITH ALL HARDWARE AND SEALANT.

- G. JOINT SEALING:
G.1. THE FOLLOWING ITEMS ARE TO BE SEALED WITH HARDCAST D TAPE AND ADHESIVE:
G.1.a. LONGITUDINAL AND TRANSVERSE SEAMS OF RECTANGULAR DUCTWORK.
G.1.b. ALL ROUND FITTINGS AND JOINT CONNECTORS USE FTA-20 FOR INDOOR USE AND RTA-20 FOR OUTDOOR USE.
G.2. FLEXIBLE DUCT AT DIFFUSERS SHALL USE INTEGRAL STAINLESS STEEL DRAW BAND AND PRESSURE SENSITIVE TAPE, HARDCAST P-301 OR EQUAL.

- H. BRACINGS, HANGERS, NUTS, ETC. SHALL BE GALVANIZED.
I. CURVED ELBOWS SHALL HAVE CENTERLINE RADIUS EQUAL TO ONE AND ONE-HALF TIMES DUCT WIDTH IN PLANE OF TURN.

- J. SQUARE ELBOWS SHALL HAVE TURNING VANES. MITER ELBOWS (NOT SQUARE) SHALL HAVE SPLITTER VANES 3 INCHES O.C.

- K. VOLUME DAMPERS SHALL BE CONSTRUCTED TO SMACNA STANDARDS AND SHALL BE YOUNG REGULATOR MODEL 4040 FOR ROUND DUCTS AND SERIES 820 FOR RECTANGULAR DUCTS.

- L. CONTRACTOR SHALL PROVIDE MANUAL VOLUME DAMPERS AT ALL BRANCH DUCTWORK IN SUPPLY AIR, RETURN AIR AND OUTSIDE AIR SYSTEMS (WHETHER SHOWN ON PLANS OR NOT) WHERE REQUIRED FOR AIR BALANCING OF HVAC SYSTEMS. ALL ACCESSIBLE VOLUME CONTROLS SHALL HAVE LOCKING QUADRANTS, ALL INACCESSIBLE CONTROLS

(DAMPERS, ETC.) SHALL BE PROVIDED WITH PERMANENT EXTENSIONS TO ACCESSIBLE SPACES. BRANCH VOLUME CONTROLS ARE IN ADDITION TO VOLUME CONTROLS AT THE REGISTERS AND DIFFUSERS.

- M. DIFFUSERS, GRILLES AND REGISTERS: AIR INLETS, OUTLETS SHALL BE PROPERLY SET IN PLACE. REGISTERS AND GRILLES SHALL BE TIGHTLY SEALED. EACH REGISTER AND DIFFUSER SHALL BE EQUIPPED WITH A VOLUME DAMPER OR AIR EXTRACTOR. PAINT INTERIOR SURFACE OF ALL UNITS FLAT BLACK. FACE AND TRIM OF ALL UNITS SHALL BE FINISHED. SIZE, FINISH, FRAMES, ACCESSORIES, CAPACITY AND PATTERN AS SHOWN ON DRAWINGS.

2.02 EXECUTION

- A. ASSEMBLE AND INSTALL DUCTWORK IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES WHICH WILL ACHIEVE AIR TIGHT (MAX. 5% LEAKAGE) AND NOISELESS (NO OBJECTIONABLE NOISE) SYSTEMS, CAPABLE OF PERFORMING EACH INDICATED SERVICE. INSTALL EACH RUN WITH MINIMUM OF JOINTS.
B. ALIGN DUCTWORK ACCURATELY AT CONNECTIONS, WITHIN 1/8" MISALIGNMENT TOLERANCE AND WITH INTERNAL SURFACES SMOOTH.
C. SUPPORT DUCTS RIGIDLY WITH SUITABLE TIES, BRACES, HANGERS AND ANCHORS OF TYPE WHICH WILL HOLD DUCT TRUE TO SHAPE AND WILL PREVENT BUCKLING.
D. PROVIDE ALL NECESSARY OFFSETS AND TRANSITIONS AS REQUIRED IN THE INSTALLATION OF THE WORK. ALTHOUGH SOME MAY NOT BE SPECIFICALLY SHOWN ON THE PLANS, OFFSET ALL DUCTS AS REQUIRED TO INCREASE HEAD ROOM UNDER THEM, TO IMPROVE THE APPEARANCE OF EXPOSED DUCTS, AND TO AVOID INTERFERENCE WITH THE WORK OF OTHER TRADES.
E. LOCATE DUCTWORK RUNS, EXCEPT AS OTHERWISE INDICATED, VERTICALLY AND HORIZONTALLY AND AVOID DIAGONAL RUNS WHEREVER POSSIBLE.
F. HOLD DUCTS CLOSE TO WALLS OVERHEAD CONSTRUCTION, COLUMNS, AND OTHER STRUCTURAL AND PERMANENT ENCLOSURE ELEMENTS OF BUILDING.
G. WHERE DUCTS PASS THROUGH INTERIOR PARTITIONS AND EXTERIOR WALLS, CONCEAL SPACE BETWEEN CONSTRUCTION OPENING AND DUCT OR DUCT-PLUS-INSULATION WITH SHEET METAL FLANGES OF SAME GAGE AS DUCT.
H. WHERE DUCTS PASS THROUGH TIME-RATED FIRE RESISTIVE CONSTRUCTION, ALL OPENINGS AROUND THE DUCTS SHALL BE SEALED WITH FIRE STOPPING MATERIAL, EXCEPT WHERE FIRE DAMPERS ARE SHOWN, NOTED OR REQUIRED.

- I. PROVIDE ANGLE, CHANNEL, OR EQUAL TYPE FRAMES FOR ALL MANUAL AND AUTOMATIC DAMPERS AND INSETTS AS REQUIRED.
J. COORDINATE DUCT INSTALLATIONS WITH INSTALLATION OF ACCESSORIES, DAMPERS, COIL FRAMES, EQUIPMENT, CONTROLS AND OTHER ASSOCIATED WORK OF DUCTWORK SYSTEM.
K. SUPPORT DUCTWORK IN MANNER COMPLYING WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS" HANGER AND SUPPORTS SECTION.

3.00 - HYDRONIC & DIRECT EXPANSION PIPING

3.01 MATERIALS

- A. HOT, CHILLED, AND CONDENSER WATER SERVICE PIPING ABOVE GROUND OF NOMINAL DIAMETER 2-1/2" OR LESS SHALL BE DRAWN-TEMPER COPPER PIPE, ASTM B88, TYPE L, WITH WROUGHT-COPPER FITTINGS, AND 95% LEAD FREE SOLDERED JOINTS.
B. REFRIGERANT PIPING SHALL BE TYPE L HARD COPPER ACR TUBING WITH WROUGHT COPPER, SOLDER JOINT FITTINGS, SILVER SOLDERED, ALL REFRIGERANT PIPING SHALL BE WELDED EXCEPT WHERE THE UNINSULATED AREA DOES NOT RESULT IN AN ENERGY LOSS TO THE SYSTEM OR AN ADVERSE EFFECT TO THE SYSTEM FROM STRAY HEAT. PIPE INSULATION SHALL BE ARMSTRONG ARMAFLEX, OWENS-CORNING FLEXIBLE TUBING, RUBICON OR APPROVED EQUAL. THICKNESS SHALL BE 3/4" ON INTERIOR PIPING AND 1" ON EXTERIOR PIPING. INSULATED PIPING EXPOSED TO WEATHER SHALL BE PROVIDED WITH ARMSTRONG ARMAFLEX FINISH AND ALL-WEATHER SERVICE JACKET FOR OUTDOOR APPLICATIONS VALVES, STRAINERS, SIGHT GLASS, FILTER DRIERS, OIL SEPARATORS, ETC. SHALL BE MANUFACTURED BY SPORLAN VALVE CO.
C. COPPER PIPING SHALL HAVE SOLDERED JOINTS OF 250 PSIG PRESSURE RATING.
D. CONDENSATE DRAIN PIPE SHALL BE COPPER TYPE M, ASTM B88, WROUGHT-COPPER FITTINGS, SOLDERED JOINTS.

- E. GATE VALVES, 2-INCH AND SMALLER: MSS SP-80; CLASS 125, BODY AND BONNET OF ASTM B 62 CAST BRONZE, WITH THREADED OR SOLDER ENDS, SOLID DISC, SILICON BRASS ALLOY STEM, BRASS PACKING GLAND, "TEFLON" IMPREGNATED PACKING, AND MALLEABLE IRON HANDWHEEL. PROVIDE CLASS 150 VALVES MEETING THE ABOVE WHERE SYSTEM PRESSURE REQUIRES.
F. BALL VALVES, 2-INCH AND SMALLER: MSS SP-110; RATED FOR 150 PSI SATURATED STEAM PRESSURE, 600 PSI WOG PRESSURE, TWO-PIECE CONSTRUCTION, WITH BRONZE BODY CONFORMING TO ASTM B 62, STANDARD PORT, CHROME-PLATED BRASS BALL, REPLACEABLE "TEFLON" OR "TFE" SEATS AND SEALS, BLOWOUT-PROOF STEM, AND VINYL-COVERED STEEL HANDLE. PROVIDE SOLDER ENDS FOR CONDENSER WATER, CHILLED WATER, AND THREADED ENDS FOR HEATING HOT WATER.

- G. PLUG VALVES, 2-INCH AND SMALLER: RATED AT 150 PSI WOG; BRONZE BODY, WITH STRAIGHT-AWAY PATTERN, SQUARE HEAD, AND THREADED ENDS
H. GLOBE VALVES, 2-INCH AND SMALLER: MSS SP-80; CLASS 125, BODY AND BONNET OF ASTM B 62 CAST BRONZE, WITH THREADED OR SOLDER ENDS, SOLID DISC, SILICON BRASS ALLOY STEM, BRASS PACKING GLAND, "TEFLON" IMPREGNATED PACKING, AND MALLEABLE IRON HANDWHEEL. PROVIDE CLASS 150 VALVES MEETING THE ABOVE WHERE SYSTEM PRESSURE REQUIRES.

- I. SWING CHECK VALVES, 2-INCH AND SMALLER: MSS SP-80; CLASS 125, CAST-BRONZE BODY AND CAP CONFORMING TO ASTM B 62, WITH HORIZONTAL SWING, Y-PATTERN, AND BRONZE OR "TEFLON" DISC, AND HAVING THREADED OR SOLDER ENDS. PROVIDE VALVES CAPABLE OF BEING REGROUND WHILE THE VALVE REMAINS IN THE LINE. PROVIDE CLASS 150 VALVES MEETING THE ABOVE SPECIFICATIONS, WITH THREADED END CONNECTIONS, WHERE SYSTEM PRESSURE REQUIRES OR WHERE CLASS 125 VALVES ARE NOT AVAILABLE.

- J. BALANCING VALVES, 2 1/2" AND SMALLER: BRONZE BODY, BALL TYPE, 125-PSIG WORKING PRESSURE, 250°F MAXIMUM OPERATING TEMPERATURE, AND HAVING THREADED ENDS. VALVES SHALL HAVE CALIBRATED ORifice OR VENTURI, CONNECTIONS FOR PORTABLE DIFFERENTIAL PRESSURE METER WITH INTEGRAL SEALS, AND BE EQUIPPED WITH A MEMORY STOP TO RETAIN SET POSITION.
K. AUTOMATIC FLOW-CONTROL VALVES: GRAY-IRON BODY, FACTORY SET TO MAINTAIN CONSTANT FLOW WITH PLUS OR MINUS 5 PERCENT OVER SYSTEM PRESSURE. FLUCTUATIONS, AND EQUIPPED WITH A READOUT KIT INCLUDING FLOW METER, PROBES, HOSES, FLOW CHARTS, AND CARRYING CASE. EACH VALVE SHALL HAVE AN IDENTIFICATION TAG ATTACHED BY CHAIN, AND BE FACTORY MARKED WITH THE ZONE IDENTIFICATION, VALVE NUMBER, AND FLOW RATE.

- L. MANUAL AIR VENT: BRONZE BODY AND NONFERROUS INTERNAL PARTS, 150-PSIG WORKING PRESSURE, 225°F OPERATING TEMPERATURE, MANUALLY OPERATED WITH SCREWDRIVER OR THUMBSCREW, WITH 1/8" DISCHARGE CONNECTION AND 1/2" INLET CONNECTION.
M. AUTOMATIC AIR VENT: DESIGNED TO VENT AUTOMATICALLY WITH FLOAT PRINCIPLE; BRONZE BODY AND NONFERROUS INTERNAL PARTS; 150-PSIG WORKING PRESSURE; 240°F OPERATING TEMPERATURE; WITH 1/2" DISCHARGE CONNECTION AND 1/2" INLET CONNECTION.
N. Y-PATTERN STRAINERS: 125-PSIG WORKING PRESSURE; CAST-IRON BODY (ASTM A 126, CLASS B), THREADED CONNECTIONS FOR 2" AND SMALLER, BOLTED COVER, PERFORATED STAINLESS-STEEL BASKET, AND BOTTOM DRAIN CONNECTION.
O. FLEXIBLE CONNECTORS: STAINLESS-STEEL BELLOWS WITH WOVEN, FLEXIBLE, BRONZE,

WIRE-REINFORCING PROTECTIVE JACKET; 150-PSIG MINIMUM WORKING PRESSURE AND 250°F MAXIMUM OPERATING TEMPERATURE. CONNECTORS SHALL HAVE FLANGED-OR THREADED-END CONNECTIONS TO MATCH EQUIPMENT CONNECTED AND SHALL BE CAPABLE OF 3/4-INCH (20-MM) MISALIGNMENT.

- P. INSULATE ALL WATER PIPING WITH DENSITY FIBROUS GLASS INSULATION WITH WHITE KRAFT BONDED TO ALUMINUM FOIL. THICKNESS AND R-VALUE AS PER TABLE 120.3-A OF CEC STANDARDS. FITTINGS SHALL BE INSULATED WITH PRE-MOLDED FIBERGLASS INSULATION. THE INTEGRITY OF THE VAPOR BARRIER SHALL BE MAINTAINED THROUGHOUT THE INSTALLATION. TAPE AND SEAL ALL JOINTS WITH VAPOR BARRIER TAPE.

3.02 EXECUTION:

- A. INSTALL HANGERS, SUPPORTS, CLAMPS, AND ATTACHMENTS TO SUPPORT PIPING PROPERLY FROM BUILDING STRUCTURE; COMPLY WITH MSS SP-69. ARRANGE FOR GROUPING OF PARALLEL RUNS OF HORIZONTAL PIPING TO BE SUPPORTED TOGETHER ON TRAPEZE TYPE HANGERS WHERE POSSIBLE. INSTALL SUPPORTS WITH MAXIMUM SPACING COMPLYING WITH MSS SP-69. WHERE PIPING OF VARIOUS SIZES IS TO BE SUPPORTED TOGETHER BY TRAPEZE HANGERS, SPACE HANGERS FOR SMALLEST PIPE SIZE OR INSTALL INTERMEDIATE SUPPORTS FOR SMALLER DIAMETER PIPE.
B. INSTALL HANGERS AND SUPPORTS COMPLETE WITH NECESSARY INSERTS, BOLTS, NUTS, WASHERS AND OTHER ACCESSORIES EXCEPT AS OTHERWISE INDICATED FOR EXPOSED CONTINUOUS PIPE RUNS; INSTALL HANGERS AND SUPPORTS OF SAME TYPE AND STYLE AS INSTALLED FOR ADJACENT SIMILAR PIPING.
C. PREVENT ELECTROLYSIS IN SUPPORT OF COPPER TUBING BY USE OF HANGERS AND SUPPORTS WHICH ARE COPPER PLATED, OR BY OTHER RECOGNIZED INDUSTRY METHODS.
D. INSTALL HANGERS AND SUPPORTS TO ALLOW CONTROLLED MOVEMENT OF PIPING SYSTEMS AND TO PERMIT FREEDOM OF MOVEMENT BETWEEN PIPE ANCHORS, AND TO FACILITATE ACTION OF EXPANSION JOINTS, EXPANSION LOOPS, EXPANSION BENDS AND SIMILAR UNITS.

- E. INSTALL HANGERS AND SUPPORTS SO THAT PIPING LIVE AND DEAD LOADING AND STRESSES FROM MOVEMENT WILL NOT BE TRANSMITTED TO CONNECTED EQUIPMENT.
F. INSTALL HANGERS AND SUPPORTS TO PROVIDE INDICATED PIPE SLOPES, AND SO THAT MAXIMUM PIPE DEFLECTIONS ALLOWED BY ANSI B31 PRESSURE PIPING CODES ARE NOT EXCEEDED.

- G. INSULATED PIPING: COMPLY WITH THE FOLLOWING INSTALLATION REQUIREMENTS.
G.1. CLAMPS: ATTACH CLAMPS, INCLUDING SPACERS, TO PIPING WITH CLAMPS PROJECTING THROUGH INSULATION; DO NOT EXCEED PIPE STRESSES ALLOWED BY ANSI B31.
G.2. SHIELDS: WHERE LOW-COMPRESSIVE-STRENGTH INSULATION OR VAPOR BARRIERS ARE INDICATED ON WATER PIPING, INSTALL COATED PROTECTIVE SHIELDS.
G.3. SADDLES: WHERE INSULATION WITHOUT VAPOR BARRIER IS INDICATED, INSTALL PROTECTION SADDLES.

- H. ALL CONNECTIONS BETWEEN DISSIMILAR METALS SHALL UTILIZE DIELECTRIC INSULATING FITTINGS, COUPLINGS AND UNIONS.

- I. PROVIDE INTERNAL LY LINED DUCTWORK WHERE INDICATED ON DRAWINGS. ACOUSTICAL DUCT LINER SHALL BE JOHNS MANVILLE LUNACUSTIC RC DUCT LINER, OR EQUAL, MATTE FACE, SUITABLE FOR VELOCITIES FROM 1500 TO 4000 FPM, IN COMPLIANCE W/ UL723 AND UL181. SECURE LINER TO DUCTWORK WITH ADHESIVE AND MECHANICAL FASTENERS PER SMACNA DUCT LINER APPLICATION STANDARD.

- B.2. FIBERGLASS DUCT AND PLENUM INSULATION ARE TO BE APPLIED ONLY WITH MANUFACTURER'S APPROVED ADHESIVES, MASTICS AND MECHANICAL FASTENING DEVICES.
C. HEATING AND COOLING DUCTWORK LOCATED ON THE ROOF
C.1. INSULATE WITH RIGID BOARD INSULATION WITH A MINIMUM R VALUE OF R-8 AS REQUIRED PER CODE. INSULATION WITH PERFORATED SHEET METAL LINER, SUITABLE FOR VELOCITIES FROM 1500 TO 4000 FPM, IN COMPLIANCE W/ UL723 AND UL181.
C.2. WHERE INTERNAL INSULATION IS APPLIED, DUCT AND PLENUM SIZES AS SHOWN ON THE DRAWINGS SHALL BE INSIDE CLEAR DIMENSIONS.

- D.1. SOFT FLEXIBLE DUCT
R-8 FOR DUCTWORKS INSTALLED IN THE OUTDOORS, SPACE BETWEEN ROOF AND INSULATED CEILING, SPACE UNDER ROOF WITH FIXED VENT OPENING TO OUTSIDE, UNCONDITIONED CRAWLSPACE, AND UNCONDITIONED SPACES, OR R-4.2 FOR DUCTWORKS INSTALLED WITHIN THE INDIRECTLY DISTRIBUTION DUCT SYSTEM AS THE SPACE BETWEEN THE CEILING AND INSULATED ROOF, WHERE THERE IS NO FIXED VENTS OR OPENINGS TO THE OUTDOORS OR TO THE UNCONDITIONED SPACES

- D.2. FOIL FACED FIBERGLASS, OWENS CORNING TYPE 75 OR EQUAL, FLAME SPREAD RATING OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT RATING OF NOT MORE THAN 10 UNLESS SHOWN OTHERWISE. ALL INSULATION SHALL BE EXTERNAL TO DUCTWORK.

- E.1. FOR EXTERIOR DUCTS: FIBERGLASS WITH FIRE RATED BLACK COATING, OWENS CORNING AEROFLEX TYPE 150.
E.2. FOR OTHER LOCATIONS SHOWN ON DRAWINGS: AEROFLEX TYPE 150, AS ABOVE, EXCEPT 1 INCH THICK. FLAME SPREAD RATINGS OF NOT MORE THAN 25 AND SMOKE DEVELOPED RATING OF NOT MORE THAN 10.

- E.3. AN EPA-APPROVED BIOCIDES IN THE AIRSTREAM COATING ENABLES OWENS CORNING DUCT LINERS TO RESIST FUNGAL OR BACTERIAL GROWTH WHEN SUBJECTED TO MICROBIAL ATTACK (DESCRIBED IN ASTM G 955 AND STANDARD PRACTICES ASTM G 21 (FUNGUS TEST) AND G 22 (BACTERIA TEST)).

- A. ALL UNITARY HEATING OR COOLING SYSTEMS, INCLUDING HEAT PUMPS, NOT CONTROLLED BY A CENTRAL ENERGY MANAGEMENT CONTROL SYSTEM (EMCS) SHALL HAVE A SETBACK PROGRAMMABLE THERMOSTAT.
A.1. SETBACK CAPABILITIES: ALL THERMOSTATS SHALL HAVE A CLOCK MECHANISM THAT ALLOWS THE BUILDING OCCUPANT TO PROGRAM THE TEMPERATURE SETPOINTS FOR AT LEAST FOUR PERIODS WITHIN 24 HOURS.

- B. HEAT PUMPS WITH SUPPLEMENTARY ELECTRIC RESISTANCE HEATERS SHALL HAVE CONTROLS.
B.1. THAT PREVENT SUPPLEMENTARY HEATER OPERATION WHEN THE HEATING LOAD CAN BE MET BY THE HEAT PUMP ALONE; AND
B.2. IN WHICH THE CUT-OFF TEMPERATURE FOR COMPRESSION HEATING IS HIGHER THAN THE CUT-OFF TEMPERATURE FOR SUPPLEMENTARY HEATING.

- C. ALL UNITARY SINGLE ZONE, AIR CONDITIONERS, HEAT PUMPS, AND FURNACES, THE THERMOSTAT SHALL COMPLY WITH THE REQUIREMENTS CALIFORNIA ENERGY COMMISSION, T-24, PART 6, REFERENCE JOINT APPENDIX JAS, ALSO KNOWN AS THE OCCUPANT CONTROLLED SMART THERMOSTATS, WHICH ARE CAPABLE OF RECEIVING DEMAND RESPONSE SIGNALS IN THE EVENT OF GRID CONGESTION AND SHORTAGES DURING HIGH ELECTRICAL DEMAND PERIODS.

- D. CONTRACTOR SHALL POST IN THE OCCUPIED SPACE TYPEWRITTEN INSTRUCTIONS ON OPERATION OF ALL CONTROLS.
(SPECIFICATIONS CONTINUED ON FOLLOWING SHEET)

- A. FURNISH AND INSTALL AIR CONDITIONING EQUIPMENT AS SPECIFIED ON THE DRAWINGS AND IN EQUIPMENT SCHEDULES.
B. DESCRIPTION: FACTORY ASSEMBLED AND TESTED; DESIGNED FOR ROOF OR SLAB INSTALLATION; AND CONSISTING OF COMPRESSORS, CONDENSERS, EVAPORATOR COILS, CONDENSER AND EVAPORATOR FANS, REFRIGERATION AND TEMPERATURE CONTROLS, FILTERS, AND DAMPERS.

- C. CASING: MANUFACTURER'S STANDARD CONSTRUCTION WITH CORROSION-PROTECTION COATING AND EXTERIOR FINISH, HINGED PANELS OR ACCESS DOORS WITH NEOPRENE GASKETS FOR INSPECTION AND ACCESS TO INTERNAL PARTS. MINIMUM 1/2-INCH THICK THERMAL INSULATION, KNOCKOUTS FOR ELECTRICAL AND PIPING CONNECTIONS, EXTERIOR CONDENSATE DRAIN CONNECTION, AND LIFTING LUGS.

- D. EVAPORATOR FANS: FORWARD CURVED, CENTRIFUGAL, BELT DRIVEN WITH ADJUSTABLE SHAFTS OR DIRECT-DRIVE FANS; AND WITH PERMANENTLY LUBRICATED MOTOR BEARINGS.
E. EXHAUST/RELIEF FANS: FORWARD-CURVED, CENTRIFUGAL OR PROPELLER TYPE, DIRECTLY DRIVEN WITH PERMANENTLY LUBRICATED MOTOR BEARINGS.

- F. CONDENSER FANS: PROPELLER TYPE, DIRECTLY DRIVEN WITH PERMANENTLY LUBRICATED MOTOR BEARINGS.
G. REFRIGERANT COILS: ALUMINUM-PLATE FIN AND SEAMLESS COPPER TUBE IN GALVANIZED STEEL CASING WITH EQUALIZING-TYPE VERTICAL DISTRIBUTOR.

- H. COMPRESSORS: SERVICEABLE, SEMI-HERMETIC, OR FULLY HERMETIC COMPRESSORS WITH INTEGRAL VIBRATION ISOLATORS AND CRANKCASE HEATERS.
I. SAFETY CONTROLS: FOR SEMI-HERMETIC COMPRESSORS PROVIDE MANUAL-RESET TYPE SAFETY CONTROLS FOR LOW PRESSURE, HIGH PRESSURE, AND COMPRESSOR MOTOR OVERLOAD PROTECTION.

- J. TIMED-OFF CONTROL: AUTOMATIC-RESET CONTROL, SHUTS COMPRESSOR OFF AFTER 5 MINUTES.
K. HEAT EXCHANGERS: MANUFACTURER'S STANDARD CONSTRUCTION FOR GAS-FIRED HEAT EXCHANGERS AND BURNERS WITH THE FOLLOWING CONTROLS:
K.1. REDUNDANT, DUAL GAS VALVES (2-STAGE HEATING).
K.2. INTERMITTENT PILOT IGNITION.

- K.3. ELECTRONIC-SPARK IGNITION SYSTEM.
K.4. HIGH-LIMIT CUTOFF.
K.5. FORCED-DRAFT PROVING SWITCH.

L. ELECTRIC HEAT: MANUFACTURER'S STANDARD CONSTRUCTION, ELECTRIC RESISTANCE, FACTORY WIRED FAN SINGLE-POINT WIRING CONNECTION, WITH OVERCURRENT AND OVERHEAT PROTECTION DEVICES.

M. ECONOMIZER CONTROL: RETURN AND OUTSIDE AIR DAMPERS, OUTSIDE AIR FILTER, FULLY MODULATING ELECTRONIC-CONTROL SYSTEM WITH ADJUSTABLE MIXED-AIR THERMOSTAT AND AUTOMATIC CHANGEOVER THROUGH ADJUSTABLE DRY BULB/ENTHALPY-CONTROL DEVICE.

N. VARIABLE-AIR/VOLUME CONTROL: ELECTRIC DISCHARGE-AIR-TEMPERATURE STEP CONTROLLER AND ELECTRONIC-CONTROL SYSTEM.

O. LOW AMBIENT CONTROL: HEAD-PRESSURE CONTROL, DESIGNED TO OPERATE AT TEMPERATURES AS LOW AS 30°F.

P. THERMOSTAT: STAGED HEATING AND COOLING WITH MANUAL OR AUTOMATIC CHANGEOVER ON STANDARD SUBBASE.

Q. SMOKE DETECTORS: PHOTOELECTRIC DUCT DETECTOR LOCATED IN SUPPLY/RETURN-AIR DISTRIBUTION PLENUM, TO DE-ENERGIZE UNIT.

R. IN BUILDINGS THAT DO NOT HAVE FIRE ALARM SYSTEMS, PROVIDE AUDIBLE AND VISUAL ALARM EQUAL TO AIR PRODUCTS AND CONTROL, INC. MODEL MS-RHP/A IN AN APPROVED LOCATION.

S. ELECTRICAL CONVENIENCE OUTLET: FACTORY WIRED 115-V, AC FUSED OUTLET, SEPARATELY VENTED, LOCATED IN UNIT CABINET.

T. OPERATING CONTROLS: FACTORY-INSTALLED MICROPROCESSOR CONTROLS AND MONITORS UNIT AND COMMUNICATES WITH CENTRAL CONTROL PROCESSOR.
T.1. CONTROL OUTPUTS: 2-STAGE HEATING, 2-STAGE COOLING, AND AUTOMATIC OR CONTINUOUS FAN OPERATION AND ECONOMIZER DAMPER OPERATION.
T.2. CONTROL SENSORS: RETURN-AIR-TEMPERATURE SENSOR, FAN AIRFLOW-PROVING SWITCH, DIRTY-FILTER SWITCH, DISCHARGE-AIR-TEMPERATURE SENSOR, ROOM-TEMPERATURE SENSOR, AND NIGHT-SETBACK-OVERRIDE SWITCH.
T.3. CONTROL FEATURES: DAY/OCCUPIED MODES FOR HIGH OR LOW ENTHALPY AND NIGHT/OCCUPIED MODE.

4.04 INSULATION (INSTALLED PER MANUFACTURER'S RECOMMENDATIONS)
A. HEATING AND COOLING DUCTWORK LOCATED IN INTERIOR LOCATIONS
A.1. INSULATE WITH OWENS-CORNING FIBERGLASS ALL SERVICE FACED DUCT WRAP TYPE 150 WITH FACTORY APPLIED FLAME RETARDANT FOIL REINFORCED KRAFT FACING (FK-25 UL LABELS), OR APPROVED EQUAL. INSTALLED THERMAL RESISTANCE SHALL BE A MINIMUM OF:
R-8 FOR DUCTWORKS INSTALLED IN THE OUTDOORS, SPACE BETWEEN ROOF AND INSULATED CEILING, SPACE UNDER ROOF WITH FIXED VENT OPENING TO OUTSIDE, UNCONDITIONED CRAWLSPACE, AND UNCONDITIONED SPACES, OR R-4.2 FOR DUCTWORKS INSTALLED IN CONCRETE SLAB, OR INSTALLED WITHIN THE INDIRECTLY CONDITIONED SPACE SUCH AS THE SPACE BETWEEN THE CEILING AND INSULATED ROOF, WHERE THERE IS NO FIXED VENTS OR OPENINGS TO THE OUTDOORS OR TO THE UNCONDITIONED SPACES.

B.1. PROVIDE INTERNALLY LINED DUCTWORK WHERE INDICATED ON DRAWINGS. ACOUSTICAL DUCT LINER SHALL BE JOHNS MANVILLE LUNACUSTIC RC DUCT LINER, OR EQUAL, MATTE FACE, SUITABLE FOR VELOCITIES FROM 1500 TO 40

MECHANICAL SPECIFICATION (CONTINUED)

4.06 SEISMIC RESTRAINTS AND BRACING

A. ALL HVAC EQUIPMENT, DUCTWORK, PIPING AND WIRING CONDUITS SHALL BE INSTALLED TO MEET THE LATERAL BRACING REQUIREMENTS FOR THE APPLICABLE SEISMIC ZONE. PROVIDE SEISMIC RESTRAINTS IN ACCORDANCE WITH SEISMIC HAZARD LEVEL (SHL) A OF THE "SEISMIC RESTRAINT MANUAL: GUIDELINES FOR MECHANICAL SYSTEMS" DATED 2009, AS PUBLISHED BY S.M.A.C.N.A. AND ALSO IN ACCORDANCE WITH APPLICABLE LOCAL BUILDING CODES.

B. ALL ROOFTOP EQUIPMENT SHALL HAVE PROPER ANCHORING AND RESTRAINT SYSTEMS AND SHALL BE SECURED TO A ROOF CURB, EQUIPMENT PAD, OR OTHER STRUCTURAL MEMBER TO PREVENT LATERAL, VERTICAL, OR OVERTURNING MOVEMENT WITHOUT SACRIFICING ANY RESILIENT VIBRATION ISOLATION REQUIREMENTS.

5.00 TESTING AND BALANCING (SEE ALSO, SECTION 15990)

BALANCING OF THE AIR CONDITIONING SYSTEM WILL BE PERFORMED BY AN INDEPENDENT TEST AND BALANCING AGENCY. THE MECHANICAL CONTRACTOR SHALL COOPERATE WITH THE SELECTED TEST AND BALANCE AGENCY IN THE FOLLOWING MANNER:

A. PROVIDE SUFFICIENT TIME BEFORE FINAL COMPLETION DATE SO THAT TEST AND BALANCING CAN BE ACCOMPLISHED.

B. PROVIDE IMMEDIATE LABOR AND TOOLS TO MAKE CORRECTIONS WHEN REQUIRED WITHOUT UNDUE DELAY. INSTALL BALANCING DAMPERS AS REQUIRED BY TEST AND BALANCE AGENCY.

C. THE CONTRACTOR SHALL PUT ALL HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS AND EQUIPMENT INTO FULL OPERATION AND SHALL CONTINUE THE OPERATION OF SAME DURING EACH WORKING DAY OF TESTING AND BALANCING.

D. TESTING AND BALANCING AGENCY SHALL BE KEPT INFORMED OF ANY MAJOR CHANGES MADE TO SYSTEM DURING CONSTRUCTION AND SHALL BE PROVIDED WITH COMPLETE AS-BUILT DRAWINGS.

E. THE MECHANICAL CONTRACTOR SHALL INCLUDE THE COSTS OF DAMPERS, PULLEY AND BELT CHANGES IN HIS CONTRACT.

6.00 SPECIAL CONDITIONS

A. AIR CONDITIONING EQUIPMENT ON ROOF: THE EXACT EQUIPMENT LOCATIONS ON THE ROOF SHALL BE FIELD VERIFIED BY CONTRACTOR. THE INTENT OF THE DESIGN IS TO UTILIZE A MANUFACTURER-SUPPLIED ROOF CURB THAT WOULD SUPPORT THE NEW EQUIPMENT.

B. CONTRACTOR SHALL CONFORM TO MANUFACTURER'S PUBLISHED INSTALLATION AND ASSEMBLY GUIDE. INSTALLATION SHALL CONFORM TO STRUCTURAL ENGINEER'S REQUIREMENTS.

C. STRUCTURAL SUPPORT FOR THE AIR CONDITIONING UNIT: THE OWNER SHALL ENGAGE A LICENSED STRUCTURAL ENGINEER TO DESIGN THE STRUCTURAL SUPPORT FOR THE AIR CONDITIONING UNIT ON THE ROOF. THE MECHANICAL CONTRACTOR IS TO COORDINATE ALL WORK WITH THE STRUCTURAL ENGINEER.

D. ALL REQUIRED PENETRATIONS OF EXISTING ROOFING SYSTEM SHALL BE MADE BY LANDLORD'S ROOFING CONTRACTOR AT OWNERS EXPENSE AFTER NOTIFICATION TO LANDLORD FOR APPROVAL.

END OF SECTION

TESTING, ADJUSTING, & BALANCING SPECIFICATION

SECTION 159900 - TESTING, ADJUSTING AND BALANCING

1.00 - GENERAL

1.01 DESCRIPTION

THE TESTING AND BALANCING WORK WILL BE PERFORMED UNDER A SEPARATE CONTRACT FROM THE HVAC WORK. THE WORK DESCRIBED IN THIS SECTION SHALL BE PERFORMED BY AN INDEPENDENT TEST AND BALANCE AGENCY, SPECIALIZING IN TESTING AND BALANCING OF HVAC SYSTEMS AND SHALL BE A MEMBER OF AABC, NEBB, OR APPROVED EQUAL ORGANIZATION.

1.02 SCOPE OF WORK

A. TEST, ADJUST, AND BALANCE HOT, CHILLED, AND CONDENSER WATER SYSTEMS, AIR MOVING EQUIPMENT, AND AIR SUPPLY, RETURN, AND EXHAUST SYSTEMS AS HEREIN SPECIFIED.

B. EACH PIECE OF AIR CONDITIONING AND HEATING EQUIPMENT AND THE AIR DISTRIBUTIONS SYSTEMS SHALL BE TESTED AND ADJUSTED TO INSURE PROPER FUNCTIONING OF ALL CONTROL, PROPER DISTRIBUTION OF AIR, MAINTENANCE OF TEMPERATURE, ELIMINATION OF DRAFTS, NOISE AND VIBRATION, AND LEFT IN FIRST CLASS OPERATING CONDITION. THE AIR SYSTEM SHALL BE READJUSTED IF REQUIRED FOR COMFORT OF EACH ROOM.

C. THE MECHANICAL CONTRACTOR WILL MAKE ANY CHANGES IN THE PULLEYS, BELTS, DAMPERS, VANES, BAFFLES AND OTHER BALANCING DEVICES REQUIRED FOR CORRECT BALANCE OF SYSTEM AS RECOMMENDED BY T&B AGENCY AND TO THE SATISFACTION OF THE OWNER.

1.03 SUBMITTALS

A. PROVIDE (1) HARD COPY & (1) SOFT COPY OF TEST AND BALANCE REPORT TO THE OWNER FOR REVIEW AND APPROVAL, LETTER SIZE, 3-RING BINDER MANUAL COMPLETE WITH INDEX PAGE AND INDEXING TABS. THE REPORT SHALL INCLUDE A SET OF REDUCED DRAWINGS WITH AIR OUTLETS AND EQUIPMENT IDENTIFIED TO CORRESPOND WITH THE MECHANICAL PLANS.

B. THE CERTIFIED TAB REPORTS SHALL INCLUDE INSTRUMENT TYPE AND MAKE, SERIAL NUMBER, DATES OF USE, AND DATES OF CALIBRATION. INSTRUMENTS USED FOR TESTING AND BALANCING MUST HAVE BEEN CALIBRATED WITHIN A PERIOD OF SIX (6) MONTHS AND CHECKED FOR ACCURACY PRIOR TO START OF WORK.

2.00 EXECUTION

2.01 EXAMINATION

A. EXAMINE THE CONTRACT DOCUMENTS TO BECOME FAMILIAR WITH PROJECT REQUIREMENTS AND TO DISCOVER CONDITIONS IN SYSTEMS' DESIGNS THAT MAY PRECLUDE PROPER TAB OF SYSTEMS AND EQUIPMENT.

B. EXAMINE SYSTEMS FOR INSTALLED BALANCING DEVICES, SUCH AS TEST PORTS, GAGE COCKS, THERMOMETER WELLS, FLOW-CONTROL DEVICES, BALANCING VALVES AND FITTINGS, AND MANUAL VOLUME DAMPERS. VERIFY THAT LOCATIONS OF THESE BALANCING DEVICES ARE ACCESSIBLE.

C. EXAMINE THE APPROVED SUBMITTALS FOR HVAC SYSTEMS AND EQUIPMENT.

D. EXAMINE EQUIPMENT PERFORMANCE DATA INCLUDING FAN AND PUMP CURVES.

E. EXAMINE SYSTEM AND EQUIPMENT INSTALLATIONS AND VERIFY THAT FIELD QUALITY-CONTROL TESTING, CLEANING, AND ADJUSTING SPECIFIED IN INDIVIDUAL SECTIONS HAVE BEEN PERFORMED.

F. EXAMINE HVAC EQUIPMENT AND FILTERS AND VERIFY THAT BEARINGS ARE GREASED, BELTS ARE ALIGNED AND TIGHT, AND EQUIPMENT WITH FUNCTIONING CONTROLS IS READY FOR OPERATION.

G. EXAMINE TERMINAL UNITS SUCH AS VARIABLE-AIR-VOLUME BOXES, AND VERIFY THAT THEY ARE ACCESSIBLE AND THEIR CONTROLS ARE CONNECTED AND FUNCTIONING.

H. EXAMINE STRAINERS. VERIFY THAT STARTUP SCREENS ARE REPLACED BY PERMANENT SCREENS WITH INDICATED PERFORATIONS.

I. EXAMINE SYSTEM PUMPS TO ENSURE ABSENCE OF ENTRAINED AIR IN THE SUCTION PIPING.

J. EXAMINE OPERATING SAFETY INTERLOCKS AND CONTROLS ON HVAC EQUIPMENT.

K. REPORT DEFICIENCIES DISCOVERED BEFORE AND DURING PERFORMANCE OF TAB PROCEDURES.

L. OBSERVE AND RECORD SYSTEM REACTIONS TO CHANGES IN CONDITIONS. RECORD DEFAULT SET POINTS IF DIFFERENT FROM INDICATED VALUES.

2.02 PREPARATION

A. PREPARE A TAB PLAN THAT INCLUDES STRATEGIES AND STEP-BY-STEP PROCEDURES.

B. COMPLETE SYSTEM-READINESS CHECKS AND PREPARE REPORTS. VERIFY THE FOLLOWING:

- B.1. PERMANENT ELECTRICAL-POWER WIRING IS COMPLETE.
- B.2. HYDRONIC SYSTEMS ARE FILLED, CLEAN, AND FREE OF AIR.
- B.3. AUTOMATIC TEMPERATURE-CONTROL SYSTEMS ARE OPERATIONAL.
- B.4. EQUIPMENT AND DUCT ACCESS DOORS ARE SECURELY CLOSED.
- B.5. BALANCE, SMOKE, AND FIRE DAMPERS ARE OPEN.
- B.6. ISOLATING AND BALANCING VALVES ARE OPEN AND CONTROL VALVES ARE OPERATIONAL.
- B.7. CEILINGS ARE INSTALLED IN CRITICAL AREAS WHERE AIR-PATTERN ADJUSTMENTS ARE REQUIRED AND ACCESS TO BALANCING DEVICES IS PROVIDED.
- B.8. WINDOWS AND DOORS CAN BE CLOSED SO INDICATED CONDITIONS FOR SYSTEM OPERATIONS CAN BE MET.

2.03 GENERAL PROCEDURES

A. PREPARE TEST REPORTS FOR BOTH FANS AND OUTLETS. OBTAIN MANUFACTURER'S OUTLET FACTORS AND RECOMMENDED TESTING PROCEDURES. CROSSCHECK THE SUMMATION OF REQUIRED OUTLET VOLUMES WITH REQUIRED FAN VOLUMES.

B. FOR VARIABLE-AIR-VOLUME SYSTEMS, DEVELOP A PLAN TO SIMULATE DIVERSITY.

C. DETERMINE THE BEST LOCATIONS IN MAIN AND BRANCH DUCTS FOR ACCURATE DUCT-AIRFLOW MEASUREMENTS.

D. CHECK AIRFLOW PATTERNS FROM THE OUTDOOR-AIR LOUVERS AND DAMPERS AND THE RETURN- AND EXHAUST-AIR DAMPERS THROUGH THE SUPPLY-FAN DISCHARGE AND MIXING DAMPERS.

E. LOCATE START-STOP AND DISCONNECT SWITCHES, ELECTRICAL INTERLOCKS, AND MOTOR STARTERS.

F. VERIFY THAT MOTOR STARTERS ARE EQUIPPED WITH PROPERLY SIZED THERMAL PROTECTION.

G. CHECK DAMPERS FOR PROPER POSITION TO ACHIEVE DESIRED AIRFLOW PATH.

H. CHECK FOR AIRFLOW BLOCKAGES.

I. CHECK CONDENSATE DRAINS FOR PROPER CONNECTIONS AND FUNCTIONING.

J. CHECK FOR PROPER SEALING OF AIR-HANDLING-UNIT COMPONENTS.

K. VERIFY THAT THE AIR DUCT SYSTEMS ARE SEALED.

L. PERFORM THE FOLLOWING MINIMUM TEST AND BALANCE:

- L.1. TEST AND ADJUST SUPPLY, RETURN, AND EXHAUST FANS TO DESIGN REQUIREMENTS.
- L.2. CHANGE SHEAVES AND BELTS AS REQUIRED TO OBTAIN DESIGN AIR QUANTITIES.
- L.3. TEST AND RECORD MOTOR ELECTRICAL CHARACTERISTICS, RPM, SERVICE FACTOR, MEASURE VOLTAGE, FULL LOAD AMPERES AND CONNECTED LOAD AMPERAGE. CHECK AND RECORD STARTER HEATERS SIZES AND RATING, REPLACEMENT BELTS SIZES, ETC.
- L.4. MAKE PITOT TUBE TRAVERSE (MINIMUM OF 16 POINT) OF MAIN SUPPLY DUCTS AND OBTAIN DESIGN CFM AT FANS. SEAL ALL TEST HOLES WITH SUITABLE HOLE PLUGS.
- L.5. TEST AND RECORD SYSTEM STATIC PRESSURES, SUCTION, AND DISCHARGE.
- L.6. TEST AND ADJUST SYSTEM FOR DESIGN CFM RECIRCULATED AIR.
- L.7. TEST AND ADJUST SYSTEM FOR DESIGN CFM OUTSIDE AIR.
- L.8. TEST AND RECORD ENTERING AIR TEMPERATURES. (D.B. HEATING AND COOLING)
- L.9. TEST AND RECORD ENTERING AIR TEMPERATURES. (W.B. COOLING)
- L.10. TEST AND RECORD LEAVING AIR TEMPERATURES. (D.B. COOLING)
- L.11. TEST AND RECORD LEAVING AIR TEMPERATURES. (W.B. COOLING)
- L.12. ADJUST ALL MAIN SUPPLY AND RETURN AIR DUCTS TO PROPER DESIGN CFM.
- L.13. ADJUST ALL ZONES TO PROPER DESIGN CFM, SUPPLY, AND RETURN.
- L.14. TEST AND ADJUST EACH DIFFUSER, GRILLES, AND REGISTER TO WITHIN 10% OF DESIGN REQUIREMENTS.
- L.15. EACH GRILLE, DIFFUSER, AND REGISTER SHALL BE IDENTIFIED AS TO LOCATION AND AREA, SIZE, TYPE, FLOW FACTOR, AND MANUFACTURER OF DIFFUSERS, GRILLES, REGISTERS, AND ALL TESTED EQUIPMENT SHALL BE IDENTIFIED AND LISTED.
- L.16. READINGS AND TESTS OF DIFFUSERS, GRILLES, AND REGISTERS SHALL INCLUDE REQUIRED FPM VELOCITY AND TEST RESULTANT VELOCITY, REQUIRED CFM AND TEST RESULTANT CFM AFTER ADJUSTMENTS.
- L.17. IN COOPERATION WITH THE TEMPERATURE CONTROL CONTRACTOR'S REPRESENTATIVE, SETTING ADJUSTMENTS OF AUTOMATICALLY OPERATED DAMPERS TO OPERATE AS SPECIFIED, INDICATED, AND/OR NOTED, THE BALANCE AGENCY SHALL CHECK ALL CONTROLS FOR PROPER CALIBRATIONS AND LIST ALL CONTROLS REQUIRING ADJUSTMENT BY THE TEMPERATURE CONTROL CONTRACTOR.
- L.18. ALL DIFFUSERS, GRILLES, AND REGISTERS SHALL BE ADJUSTED TO MINIMIZE DRAFTS IN ALL AREAS.

M. ALL EQUIPMENT SHALL BE IDENTIFIED BY EQUIPMENT SERVICE TAG, MANUFACTURER, MODEL NUMBER, AND SERIAL NUMBER, MOTOR HORSEPOWER, MOTOR NAMEPLATE VOLTAGE, MOTOR RPM, ACTUAL AND DESIGN STATIC PRESSURE, ACTUAL OUTLET VELOCITY, ACTUAL CFM, DESIGN CFM.

N. EACH AIR OUTLET SHALL BE TAGGED AND IDENTIFIED WITH MANUFACTURER, MODEL NUMBER, SIZE, VELOCITY, CORRECTION FACTOR, ACTUAL CFM, DESIGN CFM.

O. TRAVERSE READING OF MAIN SUPPLY, RETURN AND OUTSIDE AIR DUCTS TO ESTABLISH TOTAL AIRFLOW QUANTITIES.

P. TEST AND RECORD TEMPERATURES FROM MAIN SUPPLY AIR TRUNK, MIXED AIR DURING THE FULL HEATING AND FULL COOLING CYCLE AND ECONOMIZER CYCLE.

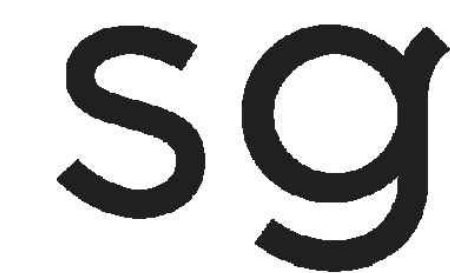
2.04 DEFICIENCIES IN SYSTEM

BALANCING CONTRACTOR SHALL REPORT IN WRITING TO THE OWNER ANY DISCREPANCIES ON ITEMS NOT INSTALLED IN ACCORDANCE WITH CONTRACT DOCUMENTS, ALL DEFICIENCIES IN HVAC SYSTEM, AND OTHER DEFICIENCIES. THE OWNER WILL REIMBURSE THE BALANCING CONTRACTOR IF ADDITIONAL WORK IS REQUIRED FOR HISHER PHASE OF WORK.

2.05 WARRANTY

THE TEST AND BALANCE AGENCY SHALL INCLUDE AN EXTENDED WARRANTY OF 90 DAYS, AFTER COMPLETION OF WORK, DURING WHICH TIME THE OWNER, AT HIS DISCRETION, MAY REQUEST A RECHECK OR RESETTING OF ANY OUTLET, SUPPLY AIR FAN, OR EXHAUST FAN AS LISTED IN TEST REPORT.

END OF SECTION



sweetgreen

3000 S. ROBERTSON BLVD.
LOS ANGELES, CALIFORNIA 90034

THESE DRAWINGS & SPECIFICATIONS ARE CONFIDENTIAL AND SHALL REMAIN THE SOLE PROPERTY OF SWEETGREEN CORPORATION. THEY SHALL NOT BE REPRODUCED (IN WHOLE OR IN PART), SHARED WITH THIRD PARTIES OR USED IN ANY MANNER ON OTHER PROJECTS OR EXTENSIONS TO THIS PROJECT WITHOUT THE PRIOR WRITTEN CONSENT OF SWEETGREEN CORPORATION. THESE DRAWINGS & SPECIFICATIONS ARE INTENDED TO EXPRESS DESIGN INTENT FOR A PROTOTYPICAL SWEETGREEN STORE WHICH IS SUBJECT TO CHANGE AT ANY TIME AND MAY NOT REFLECT ACTUAL SITE CONDITIONS. NEITHER PARTY SHALL HAVE ANY OBLIGATION OR LIABILITY TO THE OTHER (EXCEPT AS STATED ABOVE) UNTIL A WRITTEN AGREEMENT IS FULLY EXECUTED.

ARCHITECT OF RECORD:



Dewberry Architects Inc.

300 N. Lake Ave., 12th Floor
Pasadena, Ca. 91101
916.239.4256 Phone
916.2397245 Fax

STAMP:

ACIES
ENGINEERING

400 N. McCarthy Blvd., Ste 250
Milpitas, CA 95035
ph: (408) 522-5255
fx: (408) 522-5260
info@acies.net
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PROJECT INFORMATION:
DEL AMO

PROJECT INFORMATION:
**21434 HAWTHORNE BLVD
SUITE 605A
TORRANCE, CA 90503**

DRAWN BY: ACIES
CHECKED BY: GP/DY
PROJECT MANAGER: EN
SG DESIGN MANAGER: XX
SG CONSTR. MANAGER: XX
PROJECT NO: XXXXXX
TEMPLATE VERSION: 06.01.2020

| REV. | DATE | DESCRIPTION |
|------|----------|-------------------|
| A | 10/25/21 | PERMIT SET |
| B | 01/21/22 | PERMIT RESPONSE 1 |
| C | 03/25/22 | IFC |
| D | 05/04/22 | BULLETIN 1 |
| | 06/30/22 | KITCHEN UPDATES |

MECHANICAL SPECIFICATIONS

M-012

STATE OF CALIFORNIA
MECHANICAL SYSTEMS
NRC-C-MCH-E (Created 9/21)

CALIFORNIA ENERGY COMMISSION
NRC-C-MCH-E
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Report Page: 2021-09-10

CERTIFICATE OF COMPLIANCE
Project Name: Sweetgreen - Del Amo
Project Address: 21434 Hawthorne Blvd., Torrance, CA 90503
Report Page: 2021-09-10
Date Prepared: 2021-09-10

| System Name | RTU-2 | Economizer* | Differential Temperature Controls: | 03 | 04 | 05 | 06 | 07 | 08 | System Fan Type: | Constant Volume |
|---|--------------|-------------|-------------------------------------|----------------------|-----------|--|-------------------------------------|--------|-----------|---|-----------------|
| Fan Name or Item Tag | Fan Function | Qty | Maximum Design Supply Airflow (CFM) | HP Unit ² | Design HP | Fan Power Pressure Drop Adjustment - Table 140.4-B | Design Airflow through Device (CFM) | Device | None used | Calculated Adjustment (in H ₂ O) | |
| Supply fan | Supply | 1 | 3,400 | BHP | 1.06 | | | | | | |
| Total System Design Supply Airflow (CFM): 3,400 | | | | | | | | | | | |
| Total System Design (BHP): 1.06 | | | | | | | | | | | |
| Maximum System Fan Power (BHP): | | | | | | | | | | | |

* FOOTNOTE: Computer room economizers must meet requirements of §140.3(a) and will be documented on the NRC-C-PRC-E document.
 † The unit used for HP must be consistent for all fans within a system.

STATE OF CALIFORNIA
MECHANICAL SYSTEMS
NRC-C-MCH-E (Created 9/21)

CALIFORNIA ENERGY COMMISSION
NRC-C-MCH-E
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Report Page: 2021-09-10

CERTIFICATE OF COMPLIANCE
Project Name: Sweetgreen - Del Amo
Project Address: 21434 Hawthorne Blvd., Torrance, CA 90503
Report Page: 2021-09-10
Date Prepared: 2021-09-10

A. GENERAL INFORMATION

| | | | |
|--|---|---|-------------------------------|
| 01 Project Location (city) | Torrance, CA | 04 Total Conditioned Floor Area | 1,914 |
| 02 Climate Zone | 6 | 05 Total Unconditioned Floor Area | 524 |
| 03 Occupancy Types Within Project: | | 06 # of Stories (Habitable Above Grade) | 1 |
| <input type="checkbox"/> Office (B) | <input type="checkbox"/> Retail (M) | <input type="checkbox"/> Non-refrigerated Warehouse (S) | |
| <input type="checkbox"/> Hotel/ Motel Guest Rooms (R-1) | <input type="checkbox"/> School (F) | <input type="checkbox"/> Healthcare Facility (H) | |
| <input type="checkbox"/> High-Rise Residential (R-2/R-3) | <input type="checkbox"/> Relocatable Class Bldg (E) | <input checked="" type="checkbox"/> Other (Write In): | Restaurant, Fast Casual (A-2) |

† FOOTNOTES: Climate zone can be determined on the California Energy Commission's website at http://www.energy.ca.gov/maas/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 §140.5, or §141.0(b)2, for alterations.

| 01 | | 02 | | 03 | | 04 | | 05 | | 06 | | 07 | | 08 | | 09 | |
|------------------------|-----|------------------------|-----|------------------------|-----|------------------------|-----|------------------------|-----|------------------------|-----|------------------------|-----|------------------------|-----|------------------------|--|
| System Summary | AND | Pumps | AND | Fans/ Economizers | AND | System Controls | AND | Terminal Box Controls | AND | Ventilation | AND | Distribution | AND | Cooling Towers | AND | Compliance Results | |
| §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | |
| Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | COMPLIES | |
| Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | COMPLIES | |

Table Instructions: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES WITH EXCEPTIONAL CONDITIONS" refer to table D, for guidance.

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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 | AND | Pumps | AND | Fans/ Economizers | AND | System Controls | AND | Terminal Box Controls | AND | Ventilation | AND | Distribution | AND | Cooling Towers | AND | Compliance Results | |
| §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | AND | §110.1, §110.2, §140.4 | |
| Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | COMPLIES | |
| Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | Yes | AND | COMPLIES | |

Table Instructions: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES WITH EXCEPTIONAL CONDITIONS" refer to table D, for guidance.

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D. EXCEPTIONAL CONDITIONS

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

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

E. ADDITIONAL REMARKS

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

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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(c) 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 |
|------------------|---|-----------------------------------|---|----------------------------------|-------------------------------|----------------------------------|-----------------------------|-----------------------------|-----------------------------|--------------------|
| Name or Item Tag | Equipment Category per Tables 110.2 & 110.2.1 | Smallest Size Available §140.5(a) | Equipment Type per Tables 110.2 & 110.2.1 | Sensible Heating Design (kBtu/h) | Rated Heating Output (kBtu/h) | Sensible Cooling Design (kBtu/h) | Rated Cooling Load (kBtu/h) | Total Heating Load (kBtu/h) | Total Cooling Load (kBtu/h) | Compliance Results |
| RTU-1 | Unitary AC/ Condensers | Yes | AC, air cooled, split (3 phase) | 96 | 96 | 0 | 77.9 | 98.7 | 50 | 75 |
| RTU-2 | Unitary AC/ Condensers | Yes | AC, air cooled, split (3 phase) | 96 | 96 | 0 | 77.9 | 98.7 | 25 | 72 |

† 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(c). Healthcare facilities are exempt.
 ‡ It is common practice to show rated output capacity on the equipment schedule. Sensible cooling output comes from specification sheet tables.
 § If equipment is heating only, leave cooling output and load blank. If equipment is cooling only, leave heating output and load blank.
 ¶ Authority Having Jurisdiction may ask for load calculations used for compliance per §140.4(b).
 Table Continued

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G. PLUMPS

This Section Does Not Apply

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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(d), and §140.4(f). First document the system details, then add fans within that system to document compliance with fan power requirements. Fan systems serving healthcare facilities, or those serving only process loads, are exempt from these requirements and do not need to be included in Table H.

| System Name: | RTU-1 | Economizer* | Differential Temperature Controls: | 04 | 05 | 06 | 07 | 08 | 09 |
|--------------|-------|-------------|------------------------------------|----|----|----|----|----|----|
| System Name: | RTU-1 | Economizer* | Differential Temperature Controls: | 04 | 05 | 06 | 07 | 08 | 09 |
| 01 | RTU-1 | Economizer* | Differential Temperature Controls: | 04 | 05 | 06 | 07 | 08 | 09 |
| 01 | RTU-1 | Economizer* | Differential Temperature Controls: | 04 | 05 | 06 | 07 | 08 | 09 |

Table Continued

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I. VENTILATION AND INDOOR AIR QUALITY

Table Instructions: Complete the following Table to demonstrate compliance with mandatory ventilation requirements in §120.1 and §120.2(a) for all nonresidential, high-rise residential and hotel/motel occupancies. For alterations, only ventilation systems being altered within the scope of the permit application need to be documented in this table. In lieu of this table, the required outdoor ventilation rates and airflow may be shown on the plans or the calculations can be presented in a spreadsheet.

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 |
|-------------|---------------|--|--|-----------------------------|-----------------------------------|---------------------------------------|----------------------------------|---------------------------------|
| System Name | System Zoning | Conditioned Floor Area Being Served (ft ²) | Thermostats §110.2(b) & (c)1, §120.2(a) or §141.0(b)2E | Shut-Off Controls §120.2(a) | Isolation Zone Controls §120.2(a) | Demand Response §110.12 and §120.2(b) | Supply Air Temp. Reset §140.4(f) | Window Interlocks per §140.4(i) |
| RTU-1 | single zone | ≤ 25,000 ft ² | Auto | NA, Single Zone | NA, Single Zone | DR Tstat per §110.12 | NA, Single Zone | NA, No operable windows |
| RTU-2 | single zone | ≤ 25,000 ft ² | Auto | NA, Single Zone | NA, Single Zone | DR Tstat per §110.12 | NA, Single Zone | NA, No operable windows |

† 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

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J. TERMINAL BOX CONTROLS

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K. 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(f) for duct leakage testing.

| 11 | No | Yes | RTU-1,2 | Duct leakage testing triggered for these systems? | Yes |
|----|-----|-----|---------|---|-----|
| 11 | No | Yes | RTU-1,2 | Duct leakage testing triggered for these systems? | Yes |
| 12 | Yes | Yes | | | |
| 13 | Yes | Yes | | | |
| 14 | Yes | Yes | | | |

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L. TERMINAL BOX CONTROLS

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M. COOLING TOWERS

This Section Does Not Apply

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N. TERMINAL BOX CONTROLS

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O. TERMINAL BOX CONTROLS

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P. TERMINAL BOX CONTROLS

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Q. TERMINAL BOX CONTROLS

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R. TERMINAL BOX CONTROLS

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S. TERMINAL BOX CONTROLS

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T. TERMINAL BOX CONTROLS

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U. TERMINAL BOX CONTROLS

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V. TERMINAL BOX CONTROLS

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W. TERMINAL BOX CONTROLS

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X. TERMINAL BOX CONTROLS

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Y. TERMINAL BOX CONTROLS

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Z. TERMINAL BOX CONTROLS

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AA. TERMINAL BOX CONTROLS

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AB. TERMINAL BOX CONTROLS

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AC. TERMINAL BOX CONTROLS

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AD. TERMINAL BOX CONTROLS

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AE. TERMINAL BOX CONTROLS

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AF. TERMINAL BOX CONTROLS

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AG. TERMINAL BOX CONTROLS

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AH. TERMINAL BOX CONTROLS

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N. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION
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| YES | NO | Form/Title | Field Inspector |
|--------------------------|-------------------------------------|--|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCC-MCH-01-E - Must be submitted for all buildings. | Pass <input type="checkbox"/> Fail <input type="checkbox"/> |

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/>.

| YES | NO | Form/Title | Field Inspector |
|--------------------------|--------------------------|------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | | Pass <input type="checkbox"/> Fail <input type="checkbox"/> |

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| YES | NO | Form/Title | Field Inspector |
|-------------------------------------|-------------------------------------|---|--------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | NRCA-MCH-02-A Outdoor Air must be submitted for all newly installed HVAC units. NOTE: MCH-02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing for MCH-02-A is required for MCH-07-A. | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 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". | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | NRCA-MCH-04-A Air Distribution Duct Leakage | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | NRCA-MCH-05-A Air Economizer Controls | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-06-A Demand Control Ventilation Systems Acceptance must be submitted for all systems required to employ demand control ventilation (refer to 120.11(c)(3) can vary outside ventilation flow rates based on maintaining interior carbon dioxide (CO2) concentration setpoints. | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-07-A Supply Fan Variable Flow Controls | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-08-A Valve Leakage Test | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-09-A Temperature Reset Controls | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-10-A Hydronic System Variable Flow Controls | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-11-A Automatic Demand Shutoff Controls | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-12-A FDS for Packaged Direct Expansion Units | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-13-A Automatic FDS for Air Handling Units and Zone Terminal Units Acceptance | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-14-A Energy Reporting Requirements | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NOTE: This form does not automatically move to "Yes". If Distributed Energy Storage (DES) Systems are included in the scope, permit applicant should move this form to "Yes". | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | 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, Calcium Hydrate Slurry (CHS), Cryogenic or Encapsulated (Ice Ball) Systems are included in the scope, permit applicant should move this form to "Yes". | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-16-A Supply Air Temperature Reset Controls | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-17-A Condenser Water Temperature Reset Controls | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-18 Energy Management Control Systems | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-19 Occupancy Sensor Controls | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-20 Multi-Family Ventilation | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCA-MCH-21 Multi-Family Envelope Leakage | <input type="checkbox"/> |

STATE OF CALIFORNIA
Mechanical Systems
 CERTIFICATE OF COMPLIANCE
 Project Name: Sweetgreen - Del Amo
 Project Address: 21434 Hawthorne Blvd., Torrance, CA 90503
 Report Page: Page 9 of 11
 Date Prepared: 2021-09-10

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 submitted to the building inspector during construction. For more information, please refer to the compliance documents.

| YES | NO | Form/Title | Field Inspector |
|--------------------------|-------------------------------------|--|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCV-MCH-04-H Duct Leakage Test NOTE: Must be completed by a HERS Rater | Pass <input type="checkbox"/> Fail <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCV-MCH-24 Enclosure Air Leakage Worksheet NOTE: Must be completed by a HERS Rater | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCV-MCH-27 High-rise Residential NOTE: Must be completed by a HERS Rater | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | NRCV-MCH-32 Local Mechanical Exhaust NOTE: Must be completed by a HERS Rater | <input type="checkbox"/> |

STATE OF CALIFORNIA
Mechanical Systems
 CERTIFICATE OF COMPLIANCE
 Project Name: Sweetgreen - Del Amo
 Project Address: 21434 Hawthorne Blvd., Torrance, CA 90503
 Report Page: Page 10 of 11
 Date Prepared: 2021-09-10

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 | 03 | 04 |
|--|----|-------------------|--|
| Compliance with Mandatory Measures documented through MCH Mandatory Measures Note Block: | No | | |
| Heating Equipment Efficiency per §110.1 | | Mandatory Measure | Plan sheet or construction document location |
| Cooling Equipment Efficiency per §110.1 | | M-300 | Plan sheet or construction document location |
| Furnace Standby Loss Control per §110.2(d) | | N/A | |
| Duct Insulation per §120.4 | | M-011 | |
| 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 Overflow Alarm per §110.2(e)(3) | | N/A | |
| Open and Closed Circuit Cooling Towers Efficient Drift Eliminators per §110.2(e)(5) | | N/A | |
| Pipe Insulation per §120.3(i) | | N/A | |
| 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(i) | | N/A | |
| The air duct and plenum system is designed per §120.4(a)(4)(f) | | M-011 | |
| 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
 CERTIFICATE OF COMPLIANCE
 Project Name: Sweetgreen - Del Amo
 Project Address: 21434 Hawthorne Blvd., Torrance, CA 90503
 Report Page: Page 11 of 11
 Date Prepared: 2021-09-10

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
 1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Daniel Yau
 Company: ACIES Engineering
 Address: 400 N. McCarthy Blvd., Suite 250 Milpitas, CA 95035
 City/State/Zip: Milpitas, CA 95035
 Signature Date: 2021-09-10
 Signature: [Signature]
 Title: GEA / HERS Certification Identification (if applicable): (408) 522-5255
 Phone: (408) 522-5255

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: Daniel Yau
 Company: ACIES Engineering
 Address: 400 N. McCarthy Blvd., Suite 250 Milpitas, CA 95035
 City/State/Zip: Milpitas, CA 95035
 Signature Date: 2021-09-10
 Signature: [Signature]
 Title: M38083
 License: (408) 522-5255
 Phone: (408) 522-5255



sweetgreen
 3000 S. ROBERTSON BLVD.
 LOS ANGELES, CALIFORNIA 90034

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ARCHITECT OF RECORD:
Dewberry
 Dewberry Architects Inc.
 300 N. Lake Ave., 12th Floor
 Pasadena, Ca. 91101
 916.239.4256 Phone
 916.239.7245 Fax

STAMP:
ACIES ENGINEERING
 400 N. McCarthy Blvd., Ste 250
 Milpitas, CA 95035
 Ph: (408) 522-5255
 Fx: (408) 522-5250
 info@acies.net
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PROJECT INFORMATION:
DEL AMO
 21434 HAWTHORNE BLVD
 SUITE 605A
 TORRANCE, CA 90503

DRAWN BY: ACIES
 CHECKED BY: GP/DY
 PROJECT MANAGER: EN
 SG DESIGN MANAGER: XX
 SG CONSTR. MANAGER: XX
 PROJECT NO: XXXXXX
 TEMPLATE VERSION: 06.01.2020

| REV. | DATE | DESCRIPTION |
|------|----------|-------------------|
| A | 10/25/21 | PERMIT SET |
| B | 01/11/22 | PERMIT RESPONSE 1 |
| C | 03/25/22 | IFC |
| D | 05/04/22 | BULLETIN 1 |
| | 06/30/22 | KITCHEN UPDATES |

MECHANICAL T-24 FORMS

M-021

LANDLORD NOTES

- ANY CHANGES AND/OR UPGRADES TO TENANT'S EXISTING MECHANICAL SYSTEMS SHALL COMPLY WITH ALL CODES AND MALL CRITERIA. EXISTING SYSTEMS SHALL POSSESS THE CAPACITY TO HANDLE ANY AND ALL CHANGES IN LOAD.
- NO PITCH POCKETS ARE PERMITTED ON THE ROOF FOR ANY CONDENSATE DRAINS, REFRIGERANT PIPING, POWER OR CONTROL WIRING. ALL CONNECTIONS ARE TO BE MADE INSIDE THE EQUIPMENT CURB OR THROUGH PRE-MANUFACTURED PIPING CURB.
- NOTHING IS PERMITTED TO BE ATTACHED TO, SUSPENDED FROM, OR PENETRATE LANDLORD'S STRUCTURE, FLOOR DECK, OR ROOF DECK. YOU MAY ATTACH, NON-DESTRUCTIVELY, TO OR SUSPEND FROM THE TOP CHORD OF THE JOIST OR THE STRUCTURAL STEEL WHICH EXISTS ABOVE THE TENANT SPACE. WHEN ATTACHING TO LANDLORD'S STRUCTURE, DO NOT DRILL, WELD, SCREW, OR SHOOT NAILS TO STRUCTURE. ALTERNATIVE METHODS OF ATTACHMENT ONLY, NOTHING TO DAMAGE LANDLORD'S BASE BUILDING STRUCTURE. TENANT SHALL PROVIDE SIGNED AND SEALED STRUCTURAL DRAWINGS, BY A STRUCTURAL ENGINEER WITH LEGALLY ACTIVE REGISTRATION AS INDICATED BY ALL JURISDICTIONAL REQUIREMENTS, FOR ALL STRUCTURAL MODIFICATIONS FOR LANDLORD RECORDS.
- ALL PENETRATIONS TO ROOF MUST BE APPROVED BY LANDLORD. ALL RELATED ROOF WORK MUST BE DONE BY MALL'S DESIGNATED ROOFING CONTRACTOR, AT TENANT'S EXPENSE. COORDINATE ALL WORK WITH PROPERTY MANAGEMENT ON SITE.
- TENANT MUST REMOVE ALL ABANDONED ROOFTOP AND/OR MECHANICAL EQUIPMENT ABOVE LEASED PREMISES AND WITHIN THE LEASED PREMISES, AT TENANT EXPENSE. PATCH AND REPAIR ROOF AS NEEDED.
- TENANT'S GC TO LABEL ALL ROOFTOP EQUIPMENT WITH TENANT NAME SPACE NUMBER AND EQUIPMENT IDENTIFICATION (RTU-1, EF-1, ETC.) PER MALL SPECIFICATIONS/STANDARDS.
- ALL PIPING ON ROOF SHALL BE SUPPORTED ON PRE-MANUFACTURED PIPE SUPPORTS INSTALLED ON CARRY TREAD, SPACED PROPERLY TO SUPPORT PIPING. TREATED WOOD SUPPORTS ARE NOT PERMITTED.
- ALL UNEXPOSED SUPPLY AIR AND OUTSIDE AIR DUCTWORK SHALL BE EXTERNALLY INSULATED WITH 1-1/2" THICK FOIL FACE INSULATION. INTERNALLY LINED DUCTWORK MAY BE USED FOR ACOUSTIC PURPOSES ONLY, NOT AS A SUBSTITUTE FOR EXTERNAL INSULATION.
- ALL DUCTWORK SHALL BE SHEET METAL. FLEX DUCT MAY ONLY BE USED IN RUNS OF 5'-0" OR LESS.
- AT CONCLUSION OF PROJECT, HVAC SYSTEM MUST BE TESTED AND BALANCED BY A LICENSED CONTRACTOR. COPY OF BALANCE REPORT MUST BE PROVIDED TO PROPERTY MANAGEMENT OFFICE ON-SITE.

KEY NOTES

- FULL-SIZE INTERNALLY INSULATED SUPPLY & RETURN PLENUMS DOWN FROM ROOFTOP UNIT ABOVE.
- 10"x10" EXHAUST DUCT UP TO EXHAUST FAN ON ROOF.
- WALL MOUNTED THERMOSTAT @ 48" AFF. LABEL EACH THERMOSTAT ACCORDINGLY. COORDINATE THERMOSTAT LOCATION WITH WALL-MOUNTED EQUIPMENT SO THAT THE THERMOSTATS ARE NOT BLOCKED BY SHELVING, COAT RACKS, OR DOORS.
- REMOTE WALL MOUNTED TEMPERATURE SENSOR @ 60" AFF. WIRED TO THERMOSTAT IN OFFICE.
- REMOTE WALL MOUNTED TEMPERATURE AND CO2 SENSOR @ 60" AFF. WIRED TO THERMOSTAT IN OFFICE.
- MANUAL VOLUME DAMPER. (TYP)
- PROVIDE WITH INSECT SCREEN.
- CEILING EXHAUST FAN.
- 8"Ø EXHAUST DUCT UP THRU ROOF TO ROOF CAP.
- EXPOSED DUCTWORK AS SHOWN AND PER DETAIL 6/SHEET M-400.
- SMOKE DETECTOR IN SUPPLY AIR DUCT TO SHUT DOWN BOTH RTUS UPON DETECTION OF SMOKE.
- PROVIDE AUDIOVISUAL REMOTE SMOKE DETECTOR ANNUNCIATOR WITH REMOTE KEY OPERATED RESET. WIRE A UNIT BACK TO EACH SMOKE DETECTOR. MOUNT UNIT 60" AFF. TYPICAL.
- THE GENERAL CONTRACTOR SHALL FURNISH A REME HALO AIR PURIFICATION SYSTEM AND REQUIRED TRANSFORMER, PURCHASED THROUGH SWEETGREEN'S VENDOR (NATIONAL TAB) AND INSTALL SYSTEM IN THE SUPPLY AIR DUCTWORK AS SHOWN. ADJUST AS REQUIRED FOR THE SUPPLY AIRFLOW. INSTALL PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- VENTLESS CANOPY RECIRCULATING HOOD.
- WALL MOUNTED AIR CURTAIN ABOVE DOOR. INTERLOCK WITH DOOR OPERATION.
- VAV DIFFUSER. ADJUST TEMPERATURE SETTINGS ON VAV DIFFUSER WITH SITE PM PRIOR TO FINAL.
- 6"Ø COMMON FLUE VENT AND INTAKE FOR HIGH EFFICIENCY TANKLESS WATER HEATERS UP THRU ROOF. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- GC TO PROVIDE AND INSTALL TYPE II HOOD, HD-2 IN LOCATION SHOWN. SUPPORT PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. INSTALL HOOD ACCORDING TO THE REQUIREMENTS OF ITS LISTING, THE BUILDING CODE AND THE LOCAL AUTHORITY HAVING JURISDICTION.
- 12"Ø S.S EXHAUST DUCT UP TO EXHAUST FAN ON ROOF.

LANDLORD GENERAL NOTES

| | |
|-------|---|
| SCALE | - |
| NONE | |

KEY NOTES

| | |
|-------|---|
| SCALE | - |
| NONE | |

| SYMBOL & ABBREVIATION | DESCRIPTION |
|-----------------------|--|
| | SASUP SUPPLY AIR (RISE/DROP) |
| | RARET RETURN AIR DUCT (RISE/DROP) |
| | EAEXH EXHAUST AIR DUCT (RISE/DROP) |
| | CD/SR CEILING DIFFUSER/SUPPLY REGISTER (ARROWHEAD REPRESENTS NUMBER OF THROW) (4-WAY TYPICAL IF NO ARROWS) |
| | RR/RG RETURN REGISTER/GRILLE |
| | ER/EG EXHAUST REGISTER/GRILLE |
| | FC RECTANGULAR DUCT ELBOW WITH TURNING VANES |
| | MVD FLEXIBLE CONNECTION |
| | FD MANUAL VOLUME DAMPER |
| | DL FIRE DAMPER |
| | L DUCT LINING (1" THICK UNLESS OTHERWISE NOTED) |
| | T-STAT SINGLE LINE DUCT BRANCH TAKE-OFF |
| | T TEMPERATURE SENSOR |
| | S CO2 SENSOR |
| | C DUCT SMOKE DETECTOR |
| | FSD COMBINATION FIRE/SMOKE DAMPER |
| | ZD ZONE DAMPER |
| | DIA DIAMETER |
| | DL DOOR LOUVER |
| | UC DOOR UNDERCUT (3/4" MINIMUM) |
| | POC POINT OF CONNECTION |
| | SD-1 (SD-SUPPLY DIFFUSER, RD-RETURN DIFFUSER, E-EXHAUST) |
| | 100 AIR QUANTITY IN CFM |
| | AC MECHANICAL EQUIPMENT DESIGNATION |
| | 1 DESIGNATED NUMBER |

LEGEND

| | |
|-------|---|
| SCALE | - |
| NONE | |

GENERAL NOTES

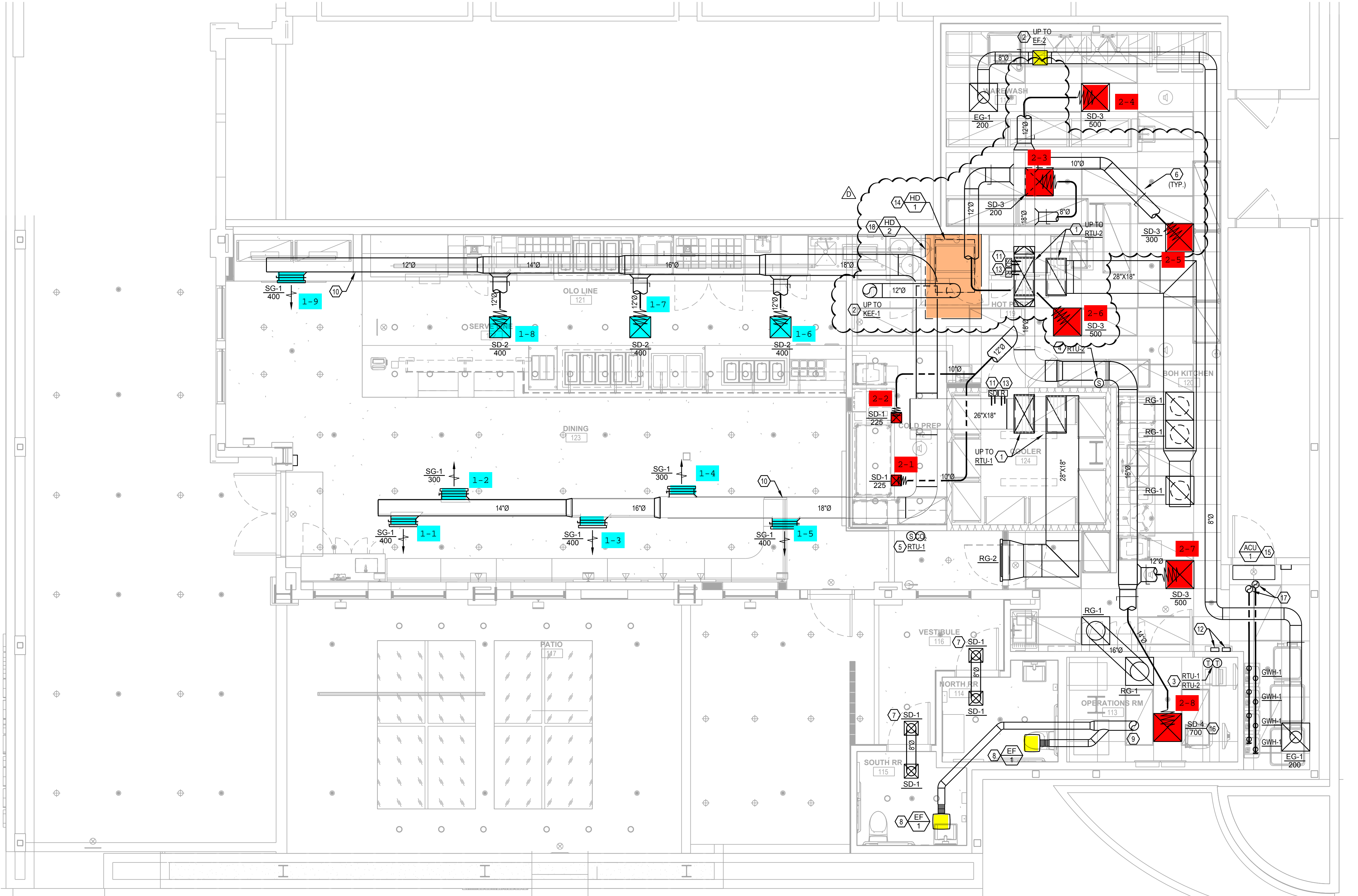
- GENERAL NOTES APPLY TO ALL HVAC SHEETS.
- MECHANICAL CONTRACTOR IS RESPONSIBLE FOR SITE INVESTIGATION PRIOR COMMENCEMENT OF WORK, AND SHALL INFORM ARCHITECT OF ANY DISCREPANCY.
- COORDINATE DUCT ROUTING WITH EXISTING PIPING, CONDUITS AND STRUCTURAL MEMBERS. DUCTWORK INSULATION SHALL BE AT LEAST 3" FROM LIGHT HOUSINGS. OFFSET AS REQUIRED.
- DO NOT ROUTE DUCTWORK OR PIPING ABOVE ELECTRICAL PANELS. VERIFY NO EXISTING DUCTWORK OR PIPING ARE INSTALLED ABOVE PANELS. RELOCATE AS NECESSARY.
- WORK SHALL COMPLY WITH STATE AND LOCAL CODE REQUIREMENTS AS APPROVED AND AMENDED BY THE AUTHORITY HAVING JURISDICTION, INCLUDING APPLICABLE SECTIONS OF NFPA, THE MECHANICAL CODE, AND ANY INTERIM AMENDMENTS AT THE TIME OF THE PROPOSAL. PURCHASE PERMITS ASSOCIATED WITH THE WORK. OBTAIN INSPECTIONS REQUIRED BY CODE. SEE SHEET G-001 FOR THE PREVAILING CODES.
- CONTRACTOR AND SUBCONTRACTORS SHALL REVIEW A COMPLETE SET OF CONSTRUCTION DOCUMENTS.
- COORDINATE WORK WITH THE WORK OF OTHER TRADES, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND THE EXISTING CONDITIONS AT THE PROJECT SITE.
- DRAWINGS FOR THE MECHANICAL WORK ARE DIAGRAMMATIC, SHOWING THE GENERAL LOCATION, TYPE, LAYOUT, AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENTS. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS. REFER TO THE MANUFACTURER'S STANDARD INSTALLATION DRAWINGS FOR EQUIPMENT CONNECTIONS AND INSTALLATION REQUIREMENTS. PROVIDE DUCTWORK, CONNECTIONS, OFFSETS, ACCESSORIES, AND MATERIALS NECESSARY FOR A COMPLETE SYSTEM.
- DUCT DIMENSIONS ON PLANS INDICATE DIMENSIONS OF INTERNAL FREE AREA.
- PERFORATED CEILING DIFFUSERS SHALL BE 4-WAY UNLESS OTHERWISE NOTED.
- COORDINATE ROOF WORK WITH THE OWNER'S CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.
- UNLESS OTHERWISE NOTED, RECTANGULAR ELBOWS GREATER THAN 45° SHALL BE MITERED ELBOWS WITH DOUBLE THICKNESS TURNING VANES AND RECTANGULAR ELBOWS 45° OR LESS SHALL BE RADIUS ELBOWS WITH AN INSIDE RADIUS OF AT LEAST 1/2 THE WIDTH OF THE DUCT.
- REPLACE AIR FILTERS WITH NEW, CLEAN MERV-13 FILTERS AT TURNOVER.
- THE TERM "FURNISH" MEANS SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS. THE TERM "INSTALL" DESCRIBES THE OPERATIONS AT THE PROJECT SITE INCLUDING THE ACTUAL UNLOADING, UNPACKING, ASSEMBLY, ERECTING, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS. THE TERM "PROVIDE" MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE.
- A FINAL REPORT FOR THE TESTING AND ADJUSTMENTS OF ALL NEW SYSTEMS FROM ALL DISCIPLINES SHALL BE COMPLETED WITH FINAL APPROVAL BY THE FIELD INSPECTOR. THIS REPORT SHALL BE SIGNED BY THE INDIVIDUAL RESPONSIBLE FOR PERFORMING THESE SERVICES.
- TESTING AND BALANCING OF THE MECHANICAL SYSTEMS TO BE COMPLETED BY NATIONAL TAB AT THE GENERAL CONTRACTOR'S EXPENSE. REFER TO THE COVER SHEET, OR CONTACT SWEETGREEN'S CONSTRUCTION MANAGER FOR CONTACT INFORMATION.
- ALL DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC, OR SHEET METAL UNTIL THE FINAL START UP OF THE HEATING, COOLING, AND VENTILATION EQUIPMENT.
- REFER TO TRANE NATIONAL ACCOUNT INFORMATION BLOCK ON SHEET M-300 FOR REPRESENTATIVE CONTACT INFORMATION.
- CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY UNIT CONFIGURATIONS, COORDINATE DELIVERY WITH TRANE, RECEIVE AND UNLOAD EQUIPMENT, INSPECT EQUIPMENT, PROPERLY INSTALL EQUIPMENT INCLUDING FIELD-INSTALLED ITEMS, EQUIPMENT STARTUP AND 1ST YEAR LABOR WARRANTY AND ADMINISTRATION.

DEMOLITION NOTES

- MECHANICAL CONTRACTOR TO COORDINATE WITH ONSITE PM REGARDING DEMOLITION AND REMOVAL OF EXISTING UNUSED HVAC EQUIPMENT.
- DEMOLISH AND REMOVE ALL RIGID & FLEXIBLE DUCTWORK UNLESS OTHERWISE NOTED ON DRAWINGS.

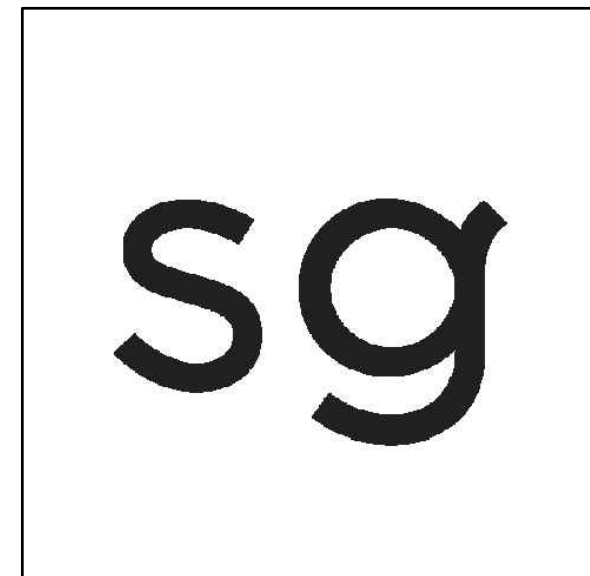
GENERAL NOTES

| | |
|-------|---|
| SCALE | - |
| NONE | |



MECHANICAL FLOOR PLAN

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



sweetgreen
3000 S. ROBERTSON BLVD.
LOS ANGELES, CALIFORNIA 90034

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ARCHITECT OF RECORD:
Dewberry
Dewberry Architects Inc.
300 N. Lake Ave., 12th Floor
Pasadena, Ca. 91101
916.239.4256 Phone
916.2397245 Fax

STAMP:
ACIES ENGINEERING
400 N. McCarthy Blvd., Ste 200
Milpitas, CA 95035
ph: (408) 522-5255
fx: (408) 522-5260
info@acies.net
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PROJECT INFORMATION:
DEL AMO
PROJECT INFORMATION:
**21434 HAWTHORNE BLVD
SUITE 605A
TORRANCE, CA 90503**

DRAWN BY: ACIES
CHECKED BY: GP/DY
PROJECT MANAGER: EN
SG DESIGN MANAGER: XX
SG CONSTR. MANAGER: XX
PROJECT NO: XXXXXX
TEMPLATE VERSION: 06.01.2020

| REV. | DATE | DESCRIPTION |
|------|----------|-------------------|
| A | 10/25/21 | PERMIT SET |
| B | 01/21/22 | PERMIT RESPONSE 1 |
| C | 03/25/22 | IFC |
| D | 05/04/22 | BULLETIN 1 |
| | 06/30/22 | KITCHEN UPDATES |

MECHANICAL FLOOR PLAN

M-100

LANDLORD ROOF GENERAL NOTES

- ROOF EQUIPMENT, INCLUDING BUT NOT LIMITED TO HVAC EQUIPMENT, KITCHEN EQUIPMENT, DUCTS, AND PIPING SHALL BE SHOWN ON A ROOF PLAN TO BE INCLUDED IN TENANT'S DRAWINGS SUBMISSION. SHALL NOT BE VISIBLE FROM THE OUTER RING ROAD OR FROM MALL SKYLIGHTS. LOCATED WITHIN THE ROOF AREA OF THE PREMISES AND MINIMUM 5'-0" FROM THE VERTICAL PLANE OF ANY DEMISING PARTITION LOCATED, AND SHALL BE COORDINATED WITH THE MALL OPERATIONS TEAM PRIOR TO THE START OF ANY WORK. EQUIPMENT SCREENS OR SCREEN WALLS MAYBE REQUIRED AND SHALL BE APPROVED IN WRITING BY LANDLORD UNDER SEPARATE COVER.
- TENANT SHALL PROVIDE A STRUCTURAL ENGINEER EVALUATION OF THE EXISTING CONSTRUCTION / STRUCTURE AND DETERMINE THAT IT IS SUFFICIENT FOR THE ADDITIONAL LOADS OF ALL NEW ROOFTOP EQUIPMENT IN ACCORDANCE WITH THE BUILDING CODE THAT HAS BEEN ADOPTED BY THE AUTHORITIES HAVING JURISDICTION (AHJ) AT TENANT'S SOLE EXPENSE. STRUCTURAL DETAILS ARE TO INCLUDE REFERENCE OF APPLICABLE BUILDING CODE(S), EXISTING BUILDING LOADS, AND ADDITIONAL LOADS THAT WILL BE ADDED TO THE STRUCTURE AND ANY REINFORCING THAT IS REQUIRED. STRUCTURAL DETAILS ARE TO BE SIGNED,

SEALED, AND SUBMIT TO THE LANDLORD FOR THEIR RECORDS BY A LICENSED STRUCTURAL ENGINEER WITH LEGALLY ACTIVE REGISTRATION IN THE STATE IN WHICH THE PROJECT IS LOCATED. LANDLORD RESERVE THE RIGHT TO HAVE A 3RD PARTY ENGINEER REVIEW TENANT'S DESIGN AND MAY REQUIRE TENANT TO PROVIDE DOCUMENTATION BY A 3RD PARTY INSPECTOR TO VERIFY THAT STRUCTURAL INSTALLATION HAS BEEN INSTALLED CORRECTLY.

- ROOF EQUIPMENT REQUIRING DECK PENETRATION SHALL BE SET ON A FACTORY SUPPLIED CURB AND MUST EXTEND A MINIMUM OF 12" ABOVE HIGHEST ROOF MATERIAL. RE-USE OF EXISTING CURBS OR THE USE OF CURB ADAPTERS IS STRICTLY PROHIBITED. TENANT SHALL RE-SLOP THE ROOF TO MAINTAIN PROPER DRAINAGE AND PROVIDE ROOFING, FLASHING, AND WATER PROOFING FOR INSTALLATION OF NEW CURB PER LANDLORD'S CRITERIA AT TENANT'S SOLE EXPENSE.

- ALL CONDENSATION, ELECTRICAL, AND DUCTWORK SHALL BE SET INSIDE THE PERIMETER OF THE CURB. CONDENSATE SHALL DRAIN INTO AN INTERIOR FLOOR DRAIN OR MOP SINK WITHIN THE PREMISES. DAYLIGHTING CONDENSATE LINES DIRECTLY ONTO THE ROOF DOWNSPOUT OR ROOF DRAIN IS STRICTLY PROHIBITED.
- TENANT SHALL PROVIDE "ROOF TRAFFIC / WALKWAY PADS" AROUND ALL ROOFTOP EQUIPMENT AND SHALL INDICATE LOCATION OF PADS ON A ROOF PLAN TO BE INCLUDED IN TENANT'S DRAWING SUBMISSION. COORDINATE FINAL LOCATION, MATERIAL, AND INSTALLATION OF PADS WITH THE MALL OPERATIONS TEAM PRIOR TO THE START OF ANY WORK.
- TENANT SHALL LABEL ALL ROOF TOP EQUIPMENT IDENTIFYING: TENANT NAME, SPACE NUMBER, AND EQUIPMENT IDENTIFICATION (RTU1, EF-1, ETC.) PER LANDLORD'S DESIGN CRITERIA.
- EQUIPMENT THAT UTILIZES CONDENSER COILS SHALL BE EQUIPPED WITH HAIL GUARDS.

LANDLORD ROOF GENERAL NOTES

SCALE
NONE

| SYMBOL & ABBREVIATION | DESCRIPTION |
|-----------------------|--|
| | SA/SUP SUPPLY AIR (RISE/DROP) |
| | RA/RET RETURN AIR DUCT (RISE/DROP) |
| | EA/EXH EXHAUST AIR DUCT (RISE/DROP) |
| | CD/SR CEILING DIFFUSER/SUPPLY REGISTER (ARROWHEAD REPRESENTS NUMBER OF THROW) (4-WAY TYPICAL IF NO ARROWS) |
| | RR/RG RETURN REGISTER/GRILLE |
| | ER/EG EXHAUST REGISTER/GRILLE |
| | RECTANGULAR DUCT ELBOW WITH TURNING VANES |
| | FLEXIBLE CONNECTION |
| | MVD MANUAL VOLUME DAMPER |
| | FD FIRE DAMPER |
| | (L) DUCT LINING (1" THICK UNLESS OTHERWISE NOTED) |
| | SINGLE LINE DUCT BRANCH TAKE-OFF |
| | DUCT TRANSITION (RECTANGULAR TO ROUND) |
| | FLEXIBLE DUCT |
| | T-STAT PROGRAMABLE THERMOSTAT |
| | TEMPERATURE SENSOR |
| | SD DUCT SMOKE DETECTOR |
| | FD FIRE DAMPER |
| | FSD COMBINATION FIRE/SMOKE DAMPER |
| | ZD ZONE DAMPER |
| | DIA. DIAMETER |
| | DL DOOR LOUVER |
| | UC DOOR UNDERCUT (3/4" MINIMUM) |
| | POC POINT OF CONNECTION |

SD-1 (SD-SUPPLY DIFFUSER, RD-RETURN DIFFUSER, E-EXHAUST)
100 AIR QUANTITY IN CFM

AC 1 MECHANICAL EQUIPMENT DESIGNATION
DESIGNATED NUMBER

LEGEND SCALE
NONE

DEMOLITION NOTE

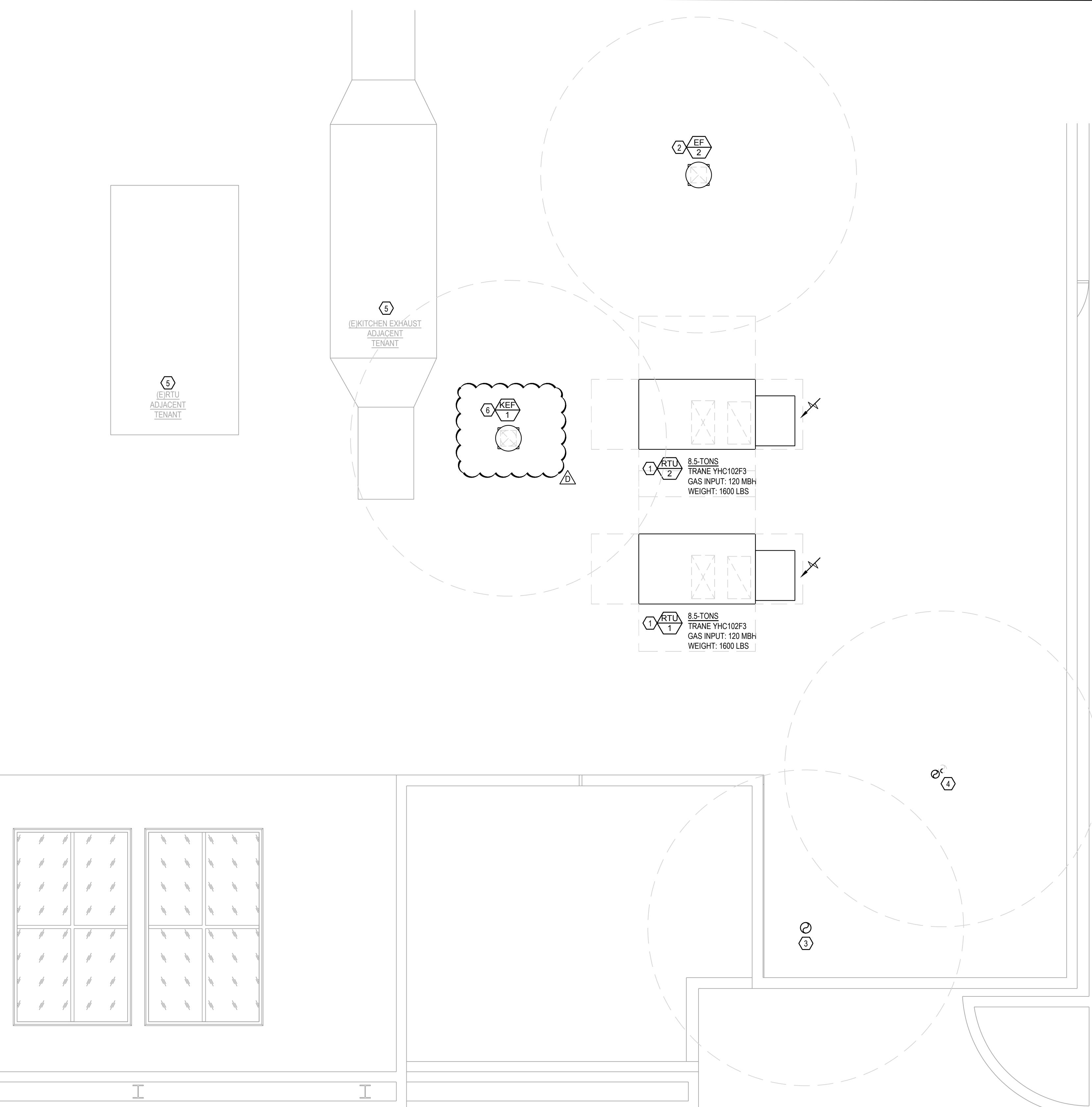
- MECHANICAL CONTRACTOR TO COORDINATE WITH ONSITE PM REGARDING DEMOLITION AND REMOVAL OF EXISTING UNUSED HVAC EQUIPMENT.

GENERAL NOTES

- MECHANICAL CONTRACTOR IS RESPONSIBLE FOR SITE INVESTIGATION PRIOR COMMENCEMENT OF WORK, AND SHALL INFORM ARCHITECT OF ANY DISCREPANCY.
- COORDINATE DUCT ROUTING WITH EXISTING PIPING, CONDUITS AND STRUCTURAL MEMBERS. DUCTWORK INSULATION SHALL BE AT LEAST 3" FROM LIGHT HOUSINGS. OFFSET AS REQUIRED.
- EXHAUST OUTLET TO BE MIN. 10 FEET AWAY FROM ALL BUILDING OPENINGS & OUTSIDE AIR INTAKE.
- LABEL ALL ROOFTOP UNITS AND EQUIPMENT WITH TENANT NAME AND SPACE NUMBER.
- ALL SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS.

KEY NOTES

- NEW PACKAGED ELECTRIC COOLING/GAS HEATING ROOFTOP UNIT INSTALLED ON NEW 14" ROOF CURB.
- NEW ROOF MUSHROOM TYPE EXHAUST FAN MOUNTED ON 12" ROOF CURB MAINTAIN 10'-0" CLEAR FROM ANY BUILDING OUTSIDE AIR INTAKE.
- 8"Ø EXHAUST DUCT ROOF CAP. MAINTAIN 10'-0" CLEAR FROM ANY BUILDING OUTSIDE AIR INTAKE.
- 6"Ø INTAKE AND FLUE VENT FROM HIGH EFFICIENCY TANKLESS WATER HEATERS.
- ADJACENT TENANT EQUIPMENT. SHOWN FOR REFERENCE ONLY.
- NEW UPBLAST TYPE EXHAUST FAN MOUNTED ON 20" ROOF CURB. MAINTAIN 10'-0" CLEAR FROM ANY BUILDING OUTSIDE AIR INTAKE. REFER TO KITCHEN HOOD DRAWINGS FOR ADDITIONAL FAN DETAILS.



MECHANICAL ROOF PLAN

SCALE
1/4" = 1'-0"

1

NOTES

SCALE
NONE



sweetgreen

3000 S. ROBERTSON BLVD.
LOS ANGELES, CALIFORNIA 90034

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ARCHITECT OF RECORD:

Dewberry Architects Inc.
300 N. Lake Ave., 12th Floor
Pasadena, Ca. 91101
916.239.4256 Phone
916.2397245 Fax

STAMP:

ACIES ENGINEERING
400 N. McCarthy Blvd., Ste 250
Milpitas, CA 95035
ph: (408) 522-5255
fx: (408) 522-5250
info@acies.net
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DANIEL YAU
No. M.38083
Exp. 09/30/22
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL
STATE OF CALIFORNIA

PROJECT INFORMATION:
DEL AMO

PROJECT INFORMATION:
**21434 HAWTHORNE BLVD
SUITE 605A
TORRANCE, CA 90503**

| | |
|---------------------|------------|
| DRAWN BY: | ACIES |
| CHECKED BY: | GP/DY |
| PROJECT MANAGER: | EN |
| SG DESIGN MANAGER: | XX |
| SG CONSTR. MANAGER: | XX |
| PROJECT NO.: | XXXXXX |
| TEMPLATE VERSION: | 06.01.2020 |

| REV. | DATE | DESCRIPTION |
|------|----------|-------------------|
| A | 10/25/21 | PERMIT SET |
| B | 01/21/22 | PERMIT RESPONSE 1 |
| C | 03/25/22 | IFC |
| D | 05/04/22 | BULLETIN 1 |
| | 06/30/22 | KITCHEN UPDATES |

MECHANICAL
ROOF PLAN

M-200

NEW PACKAGED GAS/ELECTRIC ROOFTOP UNIT SCHEDULE

| EQUIP. TAG | MANUFACTURER & MODEL | AREA SERVED | LOCATION | INDOOR FAN | | | | COOLING | | | | | | | HEATING | | | AIR FILTER EFFICIENCY | ELECTRICAL | | | PHYSICAL DATA | | REMARKS | | | |
|------------|----------------------|---------------|----------|------------------|-------------------|---------------|-----------|-------------------------|------------------------------|---------------------------------|-----------------------|--|---------------------------------------|------------------------------|-------------------------|------------------------------|------------------|-----------------------|-------------------------------|------------------------------|------------------------------|---------------|-----|---------|-----|--------------------------|--------------|
| | | | | SUPPLY AIR (CFM) | OUTSIDE AIR (CFM) | ESP (in. H2O) | MOTOR BHP | NOMINAL CAPACITY (TONS) | MINIMUM TOTAL CAPACITY (MBH) | MINIMUM SENSIBLE CAPACITY (MBH) | MINIMUM EFFICIENCY | ENTERING AIR TEMPERATURE ("Fdb"/"Fwb") | LEAVING AIR TEMPERATURE ("Fdb"/"Fwb") | AMBIENT AIR TEMPERATURE ("F) | GAS MINIMUM INPUT (MBH) | MINIMUM HEATING OUTPUT (MBH) | MINIMUM AFUE (%) | | ENTERING AIR TEMPERATURE ("F) | LEAVING AIR TEMPERATURE ("F) | AMBIENT AIR TEMPERATURE ("F) | V/phi/Hz | MCA | | MOC | HEIGHT W/O LEVELING (IN) | WEIGHT (LBS) |
| RTU-1 | TRANE YHC102F4 | DINING | ROOF | 3400 | 600 | 1.0 | 1.06 | 8.5 | 98.1 | 77.9 | 12.4 EER / 14.5 IEEER | 80/67 | 56/55 | 85 | 120 | 96 | 80 | 62 | 90 | 32 | MERV-13 | 460/3/60 | 21 | 25 | 47 | 1600 | 1-12 |
| RTU-2 | TRANE YHC102F4 | BACK OF HOUSE | ROOF | 3400 | 600 | 1.0 | 1.06 | 8.5 | 98.1 | 77.9 | 12.4 EER / 14.5 IEEER | 80/67 | 56/55 | 85 | 120 | 96 | 80 | 64 | 92 | 32 | MERV-13 | 460/3/60 | 21 | 25 | 47 | 1600 | 1-12 |

- | | | |
|--|--|---|
| <ol style="list-style-type: none"> NEW PACKAGED GAS/ELECTRIC ROOFTOP UNIT. DOWNFLOW DISCHARGE CONFIGURATION WITH CONDENSER COIL HAIL GUARD. PROVIDE NEW FACTORY 14" ROOF CURB. PROVIDE HINGED DOORS WITH MERV-13 FILTERS. REPLACE FILTERS AFTER CONSTRUCTION PRIOR TO FINAL. FACTORY MOUNTED UNPOWERED CONVENIENCE OUTLET. | <ol style="list-style-type: none"> FACTORY MOUNTED DISCONNECT SWITCH. PROVIDE CONDENSATE DRAIN. SEE PLUMBING PLANS FOR ROUTING. PROVIDE PROPER CLEARANCE FOR UNIT MAINTENANCE. PROVIDE T-24 COMPLIANT WALL-MOUNT PROGRAMMABLE THERMOSTAT. PROVIDE WALL-MOUNT REMOTE TEMPERATURE SENSOR. | <ol style="list-style-type: none"> PROVIDE SMOKE DETECTOR IN SUPPLY AIR DUCT/DISCHARGE TO SHUT DOWN UNIT UPON SMOKE DETECTION. PROVIDE WITH AUDIO/VISUAL REMOTE SMOKE DETECTOR ANNUNCIATOR WITH REMOTE KEY OPERATED RESET. MOTORIZED OUTSIDE AIR DAMPER. 100% MODULATING POWER EXHAUST. CANFAB 6144-MPE OR EQUAL. ELECTRICAL CHARACTERISTICS: 460V/3PH/60HZ, 3 MCA, 5.4 MOC. |
|--|--|---|

TRANE NATIONAL ACCOUNT - HVAC SYSTEM INFO
 CONTACT THE TRANE NATIONAL ACCOUNT TEAM FOR HVAC SYSTEM INFORMATION AT:
 EMAIL: SOCIALNA@TRANE.COM
 PHONE: (714) 983-9505 OPTION 4 (NATIONAL ACCOUNTS TEAM)

OR ANY OF THE BELOW SOUTHERN CALIFORNIA NATIONAL ACCOUNTS TEAM MEMBERS:

| | | |
|---|---|--|
| DEREK VAN RIPER (714) 227-9366 DEREK.VANRIPER@TRANE.COM | MARIA G. GARCIA (714) 983-0464 MGGARCIA@TRANE.COM | JEFF SWANSON (626) 945-6049 JSWANSON@TRANE.COM |
|---|---|--|

- HVAC EQUIPMENT IS PURCHASED AND INSTALLED BY THE CONTRACTOR
 - ANY CHANGES OR VARIATION TO THE EQUIPMENT PACKAGE THAT WOULD AFFECT THE HVAC EQUIPMENT PACKAGE SHOULD BE BROUGHT TO THE ATTENTION OF THE TRANE NATIONAL ACCOUNT TEAM AND THE ARCHITECT/ENGINEER OF RECORD AT THE TIME OF QUOTATION.

EXHAUST FAN SCHEDULE

| EQUIP. TAG | MANUFACTURER & MODEL | SERVICE | LOCATION | AIR FLOW (CFM) | TOTAL STATIC PRESSURE (in H2O) | FAN SPEED (RPM) | MOTOR SIZE | SONES | ELECTRICAL SERVICE (V/phi/Hz) | OPERATING WEIGHT (lbs) | REMARKS |
|------------|-------------------------|----------------------|----------|----------------|--------------------------------|-----------------|-------------|-------|-------------------------------|------------------------|-----------|
| EF-1 | GREENHECK SP-A90-130-VG | RESTROOMS | CEILING | 100 | 0.5 | 960 | 12W / 0.29A | 0.9 | 115/1/60 | 15 | 2,3,4,5,7 |
| EF-2 | GREENHECK G-955VG | BACK OF HOUSE | ROOF | 400 | 0.7 | 1591 | 1/6 HP | 10.8 | 115/1/60 | 70 | 1,3,4,5,6 |
| KEF-1 | CAPTIVE AIRE DU50HFA | HD-2 / BACK OF HOUSE | ROOF | 800 | 0.6 | 1333 | 1/2 HP | 12.7 | 115/1/60 | 125 | 3, 8 |

- | | | |
|--|---|--|
| <ol style="list-style-type: none"> ROOF MOUNTED MUSHROOM TYPE EXHAUST FAN ON 12" ROOF CURB. CEILING EXHAUST FAN. FLEXIBLE CONNECTION & VIBRATION ISOLATORS. | <ol style="list-style-type: none"> BACKDRAFT DAMPER. SPEED CONTROLLER. INTERLOCK TO TIMECLOCK. FAN SHALL RUN DURING OPERATING HOURS. | <ol style="list-style-type: none"> INTERLOCK TO LIGHT SWITCH. ROOF MOUNTED UPBLAST TYPE EXHAUST FAN ON 20" ROOF CURB. REFER TO HOOD DRAWINGS FOR ADDITIONAL INFORMATION. PROVIDED AND INSTALLED BY GC. |
|--|---|--|

TYPE II HOOD SCHEDULE

| EQUIP. TAG | MANUFACTURER & MODEL | TYPE | SERVICE | LENGTH | HOOD CONSTRUCTION | EXHAUST PLENUM | | | | WEIGHT (LBS) | REMARKS |
|------------|-----------------------|---------------------|-------------|--------|-------------------|----------------|-----------------------|-----------------|----------|--------------|---------|
| | | | | | | TOTAL CFM | RISE (W X L) OR (DIA) | STATIC PRESSURE | VELOCITY | | |
| HD-2 | CAPTIVE AIRE 7224 VHB | TYPE II CANOPY HOOD | COMBI OVENS | 4'-0" | 430 SS 100% | 800 | 12"Ø | -0.118" | 1019 | 345 | 1,2 |

- REFER TO CAPTIVE AIRE DRAWINGS FOR OPTIONS AND DETAILS.
- PROVIDED AND INSTALLED BY GC.

RECIRCULATING HOOD SCHEDULE

| EQUIP. TAG | MANUFACTURER & MODEL | DESCRIPTION | SUPPLIER | INSTALLER | WATTS | ELECTRICAL SERVICE (V/phi/Hz) | WEIGHT (lbs) | REMARKS |
|------------|-------------------------------------|------------------------------------|----------|-----------|-------|-------------------------------|--------------|---------|
| HD-1 | RATIONAL ULTRAVENT PLUS 6-HALF SIZE | VENTLESS CANOPY RECIRCULATING HOOD | OWNER | OWNER | 170 | 120/1/60 | 174 | 1,2 |

- UL710B LISTED RECIRCULATING HOOD.
- SERVES (2) COMBI-OVENS (ITEM K-540); MODEL: RATIONAL COMBI CLASSIC 6-HALF SIZE E, UL710B LISTED

AIR CURTAIN SCHEDULE

| EQUIP. TAG | MANUFACTURER & MODEL | SERVICE | LOCATION | AIR FLOW (CFM) | AVG OUTLET VEL. (fpm) | AMPS | MOTOR HORSE-POWER (HP) | ELECTRICAL SERVICE (V/phi/Hz) | OPERATING WEIGHT (lbs) | REMARKS |
|------------|----------------------|-----------|-----------|----------------|-----------------------|------|------------------------|-------------------------------|------------------------|---------|
| ACU-1 | BERNER SL007-1036A | REAR DOOR | REAR DOOR | 1020 | 1786 | 1.7 | 1/5 | 240/1/60 | 36 | 1,2,3,4 |

- WITH WALL MOUNTING BRACKETS FOR OVER DOOR INSTALLATION.
- MICROSWITCH & DISCONNECT BY ELECT. CONTR.
- MOTOR CONTROL PANEL.
- PROVIDE DOOR SWITCH TO INTERLOCK WITH DOOR.

AIR DISTRIBUTION SCHEDULE

| DIFFUSER TAG | TYPE | MINIMUM AIR FLOW | MAXIMUM AIR FLOW | FACE SIZE | NECK SIZE | MOUNTING | MATERIAL | MANUFACTURER/ MODEL | REMARKS |
|--------------|----------------------------------|------------------|------------------|-----------|-----------|---------------------|----------|---------------------|---------|
| SD-1 | PERFORATED CEILING DIFFUSER | - | - | 12"X12" | PER PLAN | LAY-IN / GYP. BOARD | ALUMINUM | TITUS PCS | 1, 2, 3 |
| SD-2 | PERFORATED CEILING DIFFUSER | - | - | 18"X18" | PER PLAN | LAY-IN / GYP. BOARD | ALUMINUM | TITUS PCS | 1, 2, 3 |
| SD-3 | PERFORATED CEILING DIFFUSER | - | - | 24"X24" | PER PLAN | LAY-IN / GYP. BOARD | ALUMINUM | TITUS PCS | 1, 2, 3 |
| SD-4 | PERFORATED CEILING DIFFUSER | 0 | 900 | 24"X24" | 14"Ø | LAY-IN | ALUMINUM | ACUTHERM TF-HC | 1,4 |
| SG-1 | DOUBLE DIRECTIONAL SUPPLY GRILLE | 0 | 450 | 18"X8" | 16"X6" | DUCT | ALUMINUM | TITUS 300FL | 1,3 |
| RG-1 | PERFORATED CEILING RETURN | 0 | 1500 | 24"X24" | 20"X20" | LAY-IN / GYP. BOARD | ALUMINUM | TITUS PAR | 1,3 |
| RG-2 | SIDEWALL RETURN GRILLE | 0 | 3400 | 38"X26" | 36"X24" | GYP. BOARD | ALUMINUM | TITUS 350RL | 1 |
| EG-1 | CEILING EXHAUST GRILLE | 0 | 800 | 24"X24" | 14"Ø | LAY-IN | ALUMINUM | TITUS 50F | 1,3 |

- WHITE FINISH, COORDINATE WITH ARCHITECT.
- 4-WAY PATTERN, UNLESS OTHERWISE NOTED.
- PROVIDE INTEGRAL OBD.
- VAV DIFFUSER. HOT AND COLD OPERATION.

CAPTIVEAIRE - HVAC SYSTEM INFORMATION

CONTACT THE CAPTIVEAIRE NATIONAL ACCOUNT TEAM FOR HVAC SYSTEM INFORMATION AT:
 BALA SETHURAMAN
 (301) 654-2649 X-6321
 BALA.SETHURAMAN@CAPTIVEAIRE.COM

- THE GENERAL CONTRACTOR SHALL FURNISH THE EXHAUST FAN, TYPE II HOOD (WHEN APPLICABLE), MAKEUP AIR UNIT (WHEN APPLICABLE) AND ASSOCIATED ACCESSORIES. THE GENERAL CONTRACTOR SHALL INSTALL THE EQUIPMENT TO PROVIDE A COMPLETE AND FUNCTIONING SYSTEM.

- ANY CHANGES OR VARIATION TO THE EQUIPMENT PACKAGE THAT WOULD AFFECT THE HVAC EQUIPMENT PACKAGE SHOULD BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER OF RECORD AT THE TIME OF QUOTATION.

AIR BALANCE SCHEDULE

| EQUIP. TAG | SUPPLY FLOW | RETURN FLOW | EXHAUST FLOW | SUBTOTAL |
|--------------------------|-------------|-------------|--------------|----------|
| RTU-1 | 3400 | 2800 | 0 | 600 |
| RTU-2 | 3400 | 2800 | 0 | 600 |
| EF-2 | 0 | 0 | 400 | -400 |
| KEF-1 | 0 | 0 | 800 | -800 |
| NET PRESSURIZATION (CFM) | | | | 0 |

MATERIAL SCHEDULE

| CATEGORY | APPLICATION | ALLOWABLE MATERIAL |
|----------|--|--|
| DUCT | EXPOSED SUPPLY | ROUND AS SHOWN. PAINTED TO MATCH ROOF DECK. |
| | EXPOSED RETURN | ROUND AS SHOWN. PAINTED TO MATCH ROOF DECK. |
| | EXPOSED GENERAL EXHAUST | ROUND AS SHOWN. PAINTED TO MATCH ROOF DECK. |
| | CONCEALED SUPPLY | RECTANGULAR OR ROUND AS SHOWN, LINED OR INSULATED. |
| | CONCEALED RETURN | RECTANGULAR OR ROUND AS SHOWN, LINED OR INSULATED. |
| PIPING | CONCEALED GENERAL EXHAUST IN CONDITIONED SPACE | RECTANGULAR OR ROUND AS SHOWN. |
| | CONCEAL GENERAL EXHAUST IN UNCONDITIONED SPACE | RECTANGULAR OR ROUND AS SHOWN, LINED OR INSULATED. |
| | HYDRONIC PIPING: HOT, CHILLED, AND CONDENSER WATER | TYPE L COPPER TUBE. |
| | CONDENSATE DRAINS | SCHEDULE 40 PVC PIPE FITTINGS. |

11/3/2020 1:57:11 PM

REQUIRED OUTSIDE AIR VENTILATION RATES (2019 CMC)

| Zone & Area | | Occupancy Category | Area | 2019 CMC, TABLE 402.1 | | | | | | 2019 CEC, TABLE 120.1-A | | 2019 CEC, 120.1.b.2.B | | | | | | Ventilation Air Required (CFM) | Ventilation Air Provided CFM |
|---------------|--|--------------------|-------------|-----------------------|------------------|--------------------------|------------------------------|------------|-------------------------------|--------------------------|--------------------------|--------------------------|-----------------------------|------------------|----------------------|------------------------------|--------------------------|--------------------------------|------------------------------|
| | | | | Occupants per 1000 SF | No. of Occupants | Ventilation Air (CFM/SF) | Ventilation Air (CFM/PERSON) | Total CFM | Ventilation System Efficiency | Required Ventilation CFM | Ventilation Air (CFM/SF) | Required Ventilation CFM | CBC Occupancy Load (SF/OCC) | No. of Occupants | 1/2 of CBC Occupants | Ventilation Air (CFM/PERSON) | Required Ventilation CFM | | |
| Serve Line | | Kitchen | 458 | 15 | 7 | 0.12 | 7.5 | 108 | 80% | 135 | 0.15 | 69 | 200 | 3 | 2 | 15 | 30 | 135 | |
| Dining | | Dining Room | 705 | 60 | 43 | 0.18 | 7.5 | 450 | 80% | 563 | 0.50 | 353 | 15 | 47 | 24 | 15 | 360 | 563 | |
| RTU-1 | | Total | 1163 | 50 | 50 | | | 558 | | 698 | | 422 | | 26 | | | 390 | 698 | 600 |
| Back-of-House | | Kitchen | 848 | 10 | 9 | 0.12 | 7.5 | 170 | 80% | 213 | 0.15 | 128 | 200 | 5 | 3 | 15 | 45 | 213 | |
| Office | | Office Space | 92 | 5 | 1 | 0.06 | 5 | 11 | 80% | 14 | 0.15 | 14 | 200 | 1 | 1 | 15 | 15 | 15 | |
| RTU-2 | | Total | 3266 | 10 | 10 | | | 181 | | 227 | | 142 | | 30 | | | 60 | 227 | 600 |



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3000 S. ROBERTSON BLVD.
 LOS ANGELES, CALIFORNIA 90034

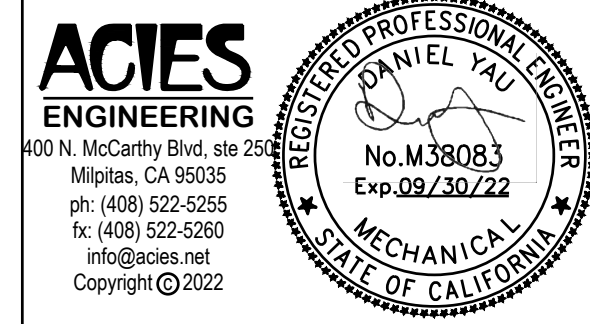
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ARCHITECT OF RECORD:



Dewberry Architects Inc.
 300 N. Lake Ave., 12th Floor
 Pasadena, Ca. 91101
 916.239.4256 Phone
 916.2397245 Fax

STAMP:



PROJECT INFORMATION:
DEL AMO
 PROJECT INFORMATION:
21434 HAWTHORNE BLVD
SUITE 605A
TORRANCE, CA 90503

DRAWN BY: ACIES
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| D | 05/04/22 | BULLETIN 1 |
| | 06/30/22 | KITCHEN UPDATES |

MECHANICAL SCHEDULES

M-300

SEQUENCE OF OPERATIONS

PACKAGED SINGLE ZONE AIR CONDITIONER

OCCUPIED:
DURING OCCUPIED PERIODS THE SUPPLY FAN WILL RUN CONTINUOUSLY AND THE OUTSIDE AIR DAMPER WILL OPEN TO MINIMUM POSITION OR BASE DAMPER POSITION (10% OPEN) IF EQUIPPED WITH DCV. THE SIX (6) MODES OF OPERATION DURING OCCUPIED MODE ARE ECONOMIZER, COOLING, HEATING, VENTILATION, DEMAND CONTROL VENTILATION, AND STANDBY MODE.

ECONOMIZER:
DURING OCCUPIED MODE, WHEN THE SPACE TEMP RISES 2 DEGREES HIGHER THAN SPACE TEMP SET POINT, AND WHEN OA TEMPERATURE IS BELOW THE RA TEMPERATURE, THE OUTSIDE AIR DAMPER WILL MODULATE OPEN TO MAINTAIN SUPPLY TEMP SET POINT OF 55 DEGREES. IF THE ECONOMIZER IS AT 100% OPEN AND CONTINUE ECONOMIZING, MECHANICAL COOLING WILL BE ACTIVATED. THE ECONOMIZER CYCLE IS THE FIRST STAGE OF COOLING AND WILL CONTROL TO THE SPACE TEMPERATURE SET POINT. WHEN OA TEMPERATURE IS ABOVE RA TEMPERATURE, THE ECONOMIZER CYCLE WILL BE DEACTIVATED AND THE OUTDOOR AIR DAMPER WILL MODULATE CLOSE TO MINIMUM DAMPER POSITION.

COOLING:
DURING OCCUPIED MODE, WHEN SPACE TEMP IS 2 DEGREES HIGHER THAN THE CONTROL TEMP COOLING SET POINT (72 DEG. F), THE COOLING MODE WILL BE ACTIVATED. CONVERSELY, WHEN THE SPACE TEMP IS 2 DEGREES LOWER THAN THE CONTROL COOLING SET POINT, COOLING MODE WILL BE DEACTIVATED. WHEN CONDITIONED SPACES BECOME UNOCCUPIED FOR MORE THAN 5 MINUTES AS SENSED BY OCCUPANCY SENSORS, COOLING MODE WILL BE DEACTIVATED AND PLACED INTO STANDBY MODE.

HEATING:
DURING OCCUPIED MODE, WHEN THE SPACE TEMP DROPS 2 DEGREES LOWER THAN SPACE HEATING CONTROL SET POINT (70 DEG. F), HEATING MODE WILL BE ACTIVATED; AND WHEN SPACE TEMP IS 2 DEGREES HIGHER THAN HEATING CONTROL SET POINT, HEATING MODE WILL BE DEACTIVATED. WHEN CONDITIONED SPACES BECOME UNOCCUPIED FOR MORE THAN 5 MINUTES AS SENSED BY OCCUPANCY SENSORS, HEATING MODE WILL BE DEACTIVATED AND PLACED INTO STANDBY MODE.

VENTILATION:
DURING OCCUPIED MODE, WHEN THE SPACE TEMP IS BETWEEN 2 DEGREES BELOW SPACE COOLING SET POINT AND 2 DEGREES ABOVE ZONE HEATING SET POINT, THE SUPPLY FAN WILL RUN CONTINUOUSLY, THE OUTSIDE AIR DAMPER WILL BE AT MINIMUM DAMPER POSITION, EXCEPT IN DEMAND CONTROL VENTILATION, AND BOTH HEATING AND COOLING COILS ARE DISABLED.

DEMAND CONTROL VENTILATION:
WHEN CO2 SENSOR INDICATE CO2 CONCENTRATION ABOVE 1000 PPM (ADJ.) IN THE SPACE, THE OUTSIDE AIR DAMPER MODULATES OPEN FROM BASE DAMPER POSITION (10% OPEN) TO MINIMUM DAMPER POSITION. THE SEQUENCE WORKS IN REVERSE WHEN THE CO2 CONCENTRATION REDUCES BELOW SETPOINT, OA DAMPERS MODULATE CLOSE TO REACH BASE DAMPER POSITION.

UNOCCUPIED:
DURING UNOCCUPIED PERIODS THE SUPPLY FAN WILL BE OFF. RETURN AIR DAMPERS 100% OPEN, AND OUTSIDE AIR DAMPERS 100% CLOSED. THE TWO MODES OF OPERATION DURING UNOCCUPIED MODE ARE NIGHT/DAY SETBACK AND NIGHT PURGE.

NIGHT/DAY SETBACK:
WHEN THE SPACE TEMP IS BELOW THE UNOCCUPIED HEATING SETPOINT (60°F ADJ), SUPPLY FAN WILL START, OUTSIDE AIR DAMPER WILL REMAIN CLOSED, AND HEATING MODE ENABLED. WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED HEATING SETPOINT (60°F ADJ) PLUS THE UNOCCUPIED DIFFERENTIAL (4°F ADJ), HEATING MODE WILL BE DISABLED AND THE SUPPLY FAN WILL STOP.

WHEN THE SPACE TEMP IS ABOVE THE UNOCCUPIED COOLING SETPOINT (85°F ADJ), SUPPLY FAN WILL START, OUTSIDE AIR DAMPER WILL REMAIN CLOSED, AND COOLING MODE ENABLED. WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING SETPOINT (85°F ADJ) MINUS THE UNOCCUPIED DIFFERENTIAL (4°F ADJ), COOLING MODE WILL BE DISABLED, AND THE SUPPLY FAN WILL STOP.

NIGHT PURGE:
DURING BUILDING FLUSH-OUT, THE ECONOMIZER SHALL MODULATE THE OUTSIDE AIR DAMPERS OPEN TO PURGE THE BUILDING WHEN OUTDOOR AIR TEMPERATURES ARE LOWER THAN SPACE AIR TEMPERATURE AND STOP WHEN SPACE TEMPERATURE REACHES 68°F. FLUSH-OUT SHALL START A 5:00 AM (ADJ.) AND STOP PRIOR TO MORNING COOL-DOWN CYCLE. NIGHT-TIME PURGE SHALL OPERATE ONLY DURING COOLING SEASON.

OPTIMAL START:
DURING OPTIMAL START, IF THE SPACE TEMPERATURE IS BELOW THE OCCUPIED HEATING SETPOINT (70°F ADJ), A MORNING WARM-UP SEQUENCE WILL BE ACTIVATED. THE SUPPLY FAN WILL START, OUTSIDE AIR DAMPER WILL REMAIN CLOSED, AND HEATING MODE ENABLED. WARM-UP WILL TERMINATE WHEN THE SPACE TEMPERATURE REACHES THE OCCUPIED HEATING SETPOINT (70°F ADJ) OR THE OCCUPIED TIME PERIOD HAS STARTED.

DURING OPTIMAL START, IF THE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SETPOINT (72°F ADJ), A MORNING COOL DOWN SEQUENCE WILL BE ACTIVATED BEFORE OCCUPANCY (ADJ.). THE SUPPLY FAN WILL START, OUTSIDE AIR DAMPER WILL REMAIN CLOSED, AND COOLING MODE ENABLED. OUTDOOR AIR DAMPERS SHALL MODULATE WHEN OUTDOOR AIR TEMPERATURE IS OPTIMAL FOR ECONOMIZING. COOL DOWN MODE WILL TERMINATE WHEN THE SPACE TEMPERATURE REACHES THE OCCUPIED COOLING SETPOINT (72°F ADJ) OR THE OCCUPIED TIME PERIOD HAS STARTED.

FREEZE PROTECTION:
DURING THE OCCUPIED COOLING MODE, THE OUTSIDE AIR DAMPER WILL MODULATE TO MINIMUM POSITION IF THE SUPPLY AIR TEMPERATURE DROPS BELOW 50°F (ADJ); AND IF THE SUPPLY AIR TEMPERATURE SENSOR SHOULD FAIL WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW 40 DEGREES, THE OUTSIDE AIR DAMPER WILL CLOSE, AND AN ALARM WILL BE ANNUNCIATED. LOW LIMIT TEMPERATURE CUT-OFF FUNCTION SHALL BE ACHIEVED BY BAS THROUGH SOFTWARE VIA THE OUTDOOR AIR TEMPERATURE SENSOR.

FIRE ALARM MODE:
A ZONE FIRE ALARM SIGNAL FROM THE FIRE COMMAND PANEL WILL SHUT DOWN THE SUPPLY FANS UPON DETECTION OF SMOKE FROM ANY SMOKE DETECTOR. OUTDOOR AIR DAMPERS SHALL CLOSE TO THEIR NORMAL CLOSED POSITION WHENEVER SUPPLY FAN IS OFF. THE SYSTEM SHALL RETURN TO NORMAL OPERATION WHEN THE FIRE ALARM HAS CLEARED AND THE SYSTEM HAS BEEN RESET.

EXHAUST FANS (EF-1 & EF-2)

OCCUPIED:

FAN OPERATION:
WHEN SCHEDULED BY THE TIME CLOCK TO BE IN OCCUPIED MODE, THE EXHAUST FAN IS TO START AND RUN CONTINUOUSLY.

UNOCCUPIED:

FAN OPERATION:
WHEN SCHEDULED BY THE TIME CLOCK TO BE IN UNOCCUPIED MODE, THE EXHAUST FAN SHALL REMAIN OFF.



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LOS ANGELES, CALIFORNIA 90034

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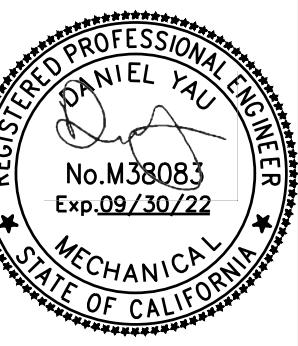
Dewberry Architects Inc.

300 N. Lake Ave., 12th Floor
Pasadena, Ca. 91101
916.239.4256 Phone
916.2397245 Fax

STAMP:

ACIES
ENGINEERING

400 N. McCarthy Blvd., Ste 250
Milpitas, CA 95035
ph: (408) 522-5255
fx: (408) 522-5260
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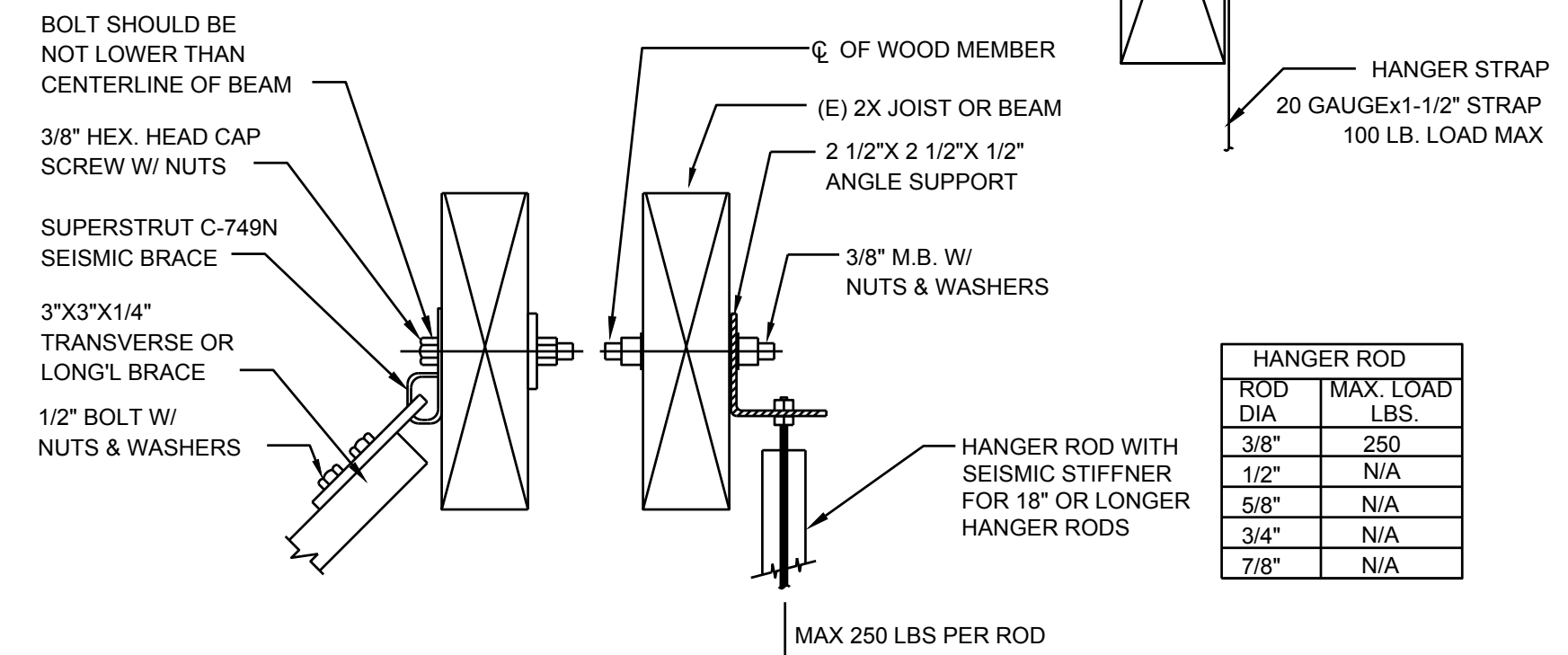
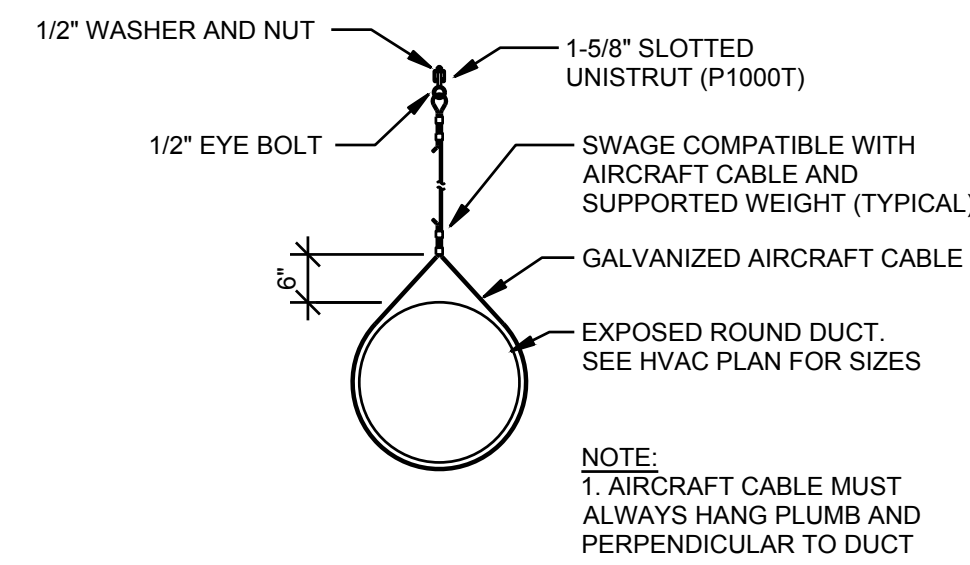
PROJECT INFORMATION:
**21434 HAWTHORNE BLVD
SUITE 605A
TORRANCE, CA 90503**

DRAWN BY: ACIES
CHECKED BY: GP/DY
PROJECT MANAGER: EN
SG DESIGN MANAGER: XX
SG CONSTR. MANAGER: XX
PROJECT NO: XXXXXX
TEMPLATE VERSION: 06.01.2020

| REV. | DATE | DESCRIPTION |
|------|----------|-------------------|
| A | 10/25/21 | PERMIT SET |
| B | 01/21/22 | PERMIT RESPONSE 1 |
| C | 03/25/22 | IFC |
| D | 05/04/22 | BULLETIN 1 |
| | 06/30/22 | KITCHEN UPDATES |

**MECHANICAL
SCHEDULES**

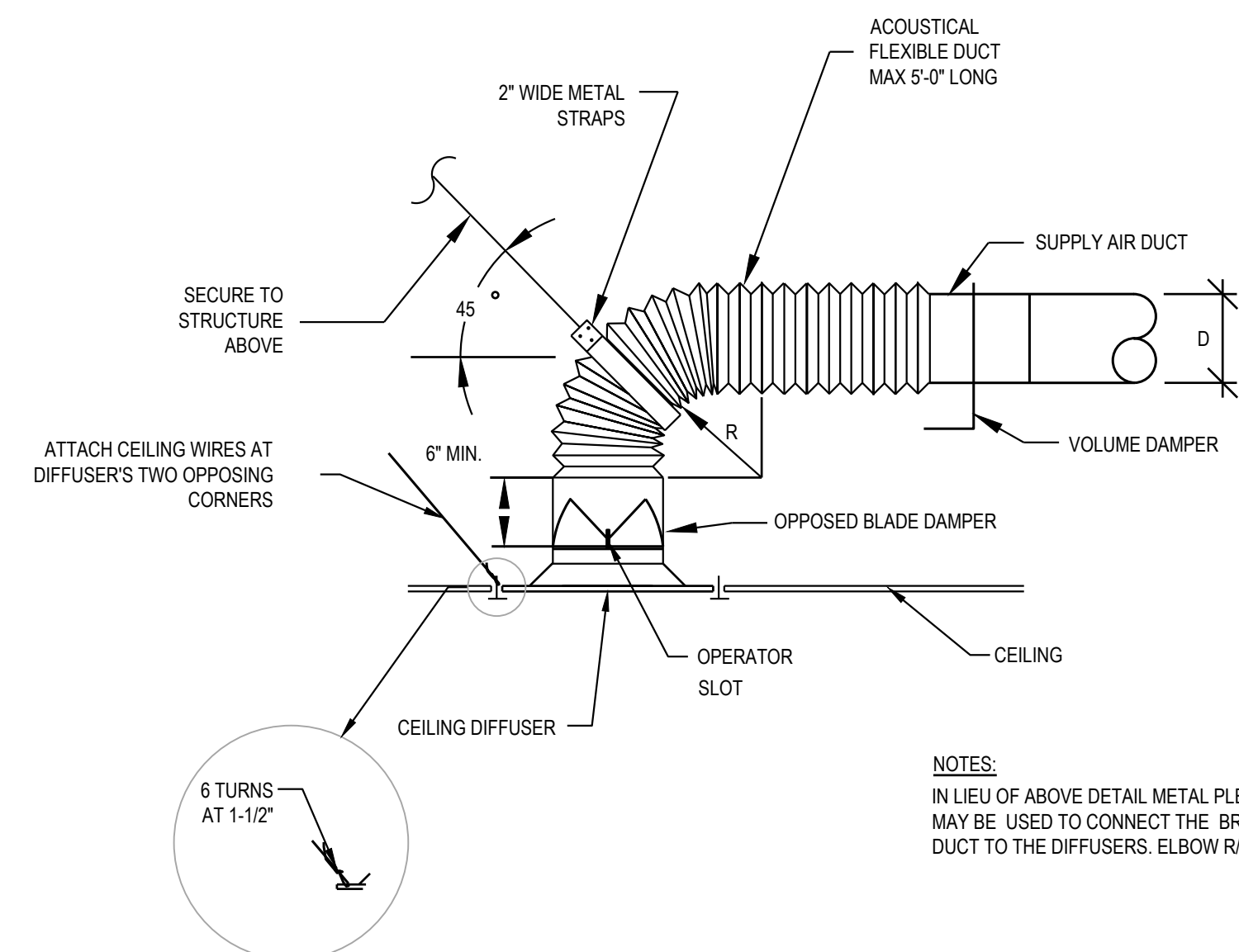
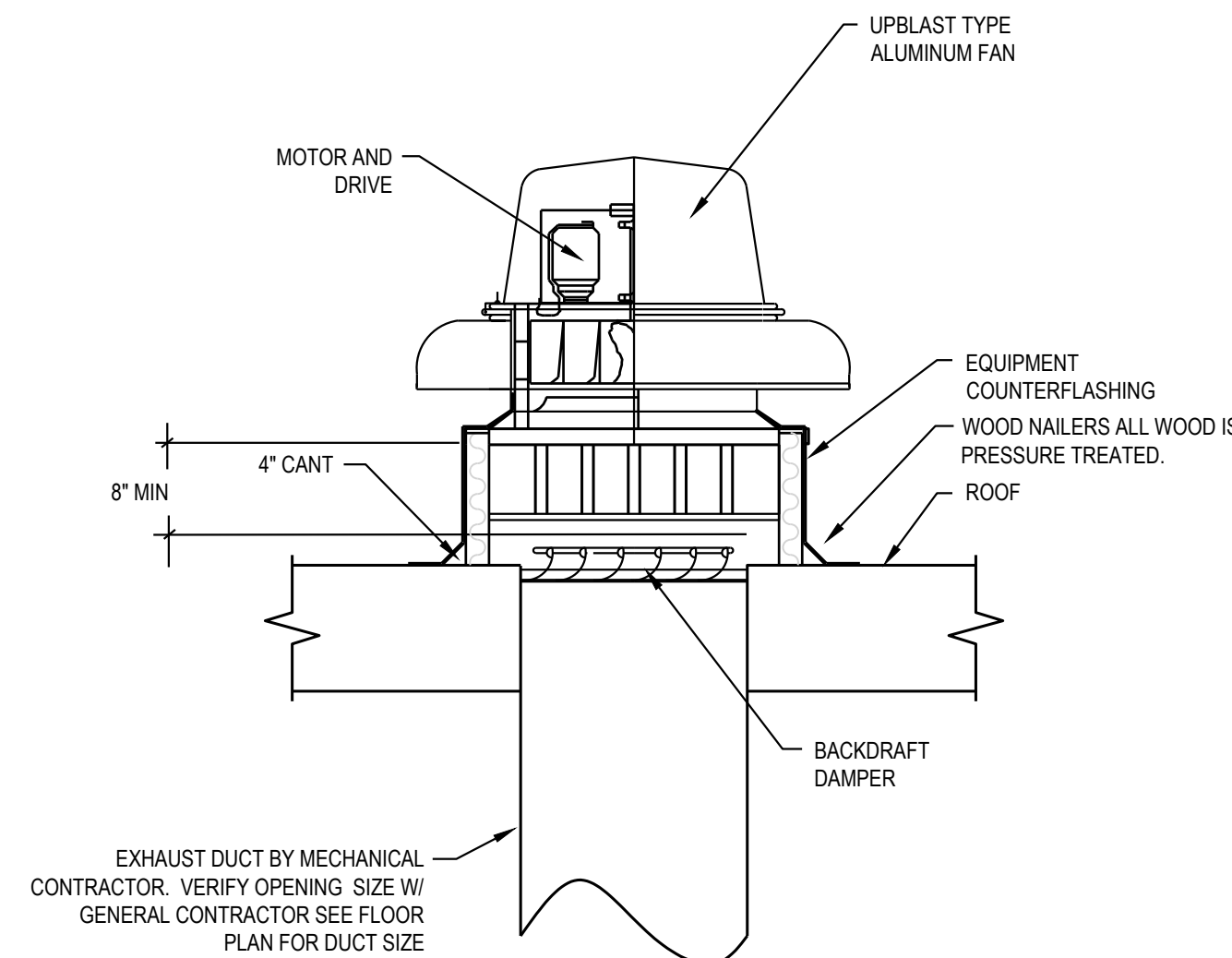
M-310



NOT USED
NOT TO SCALE
9

EXPOSED DUCTWORK SUPPORT
NOT TO SCALE
6

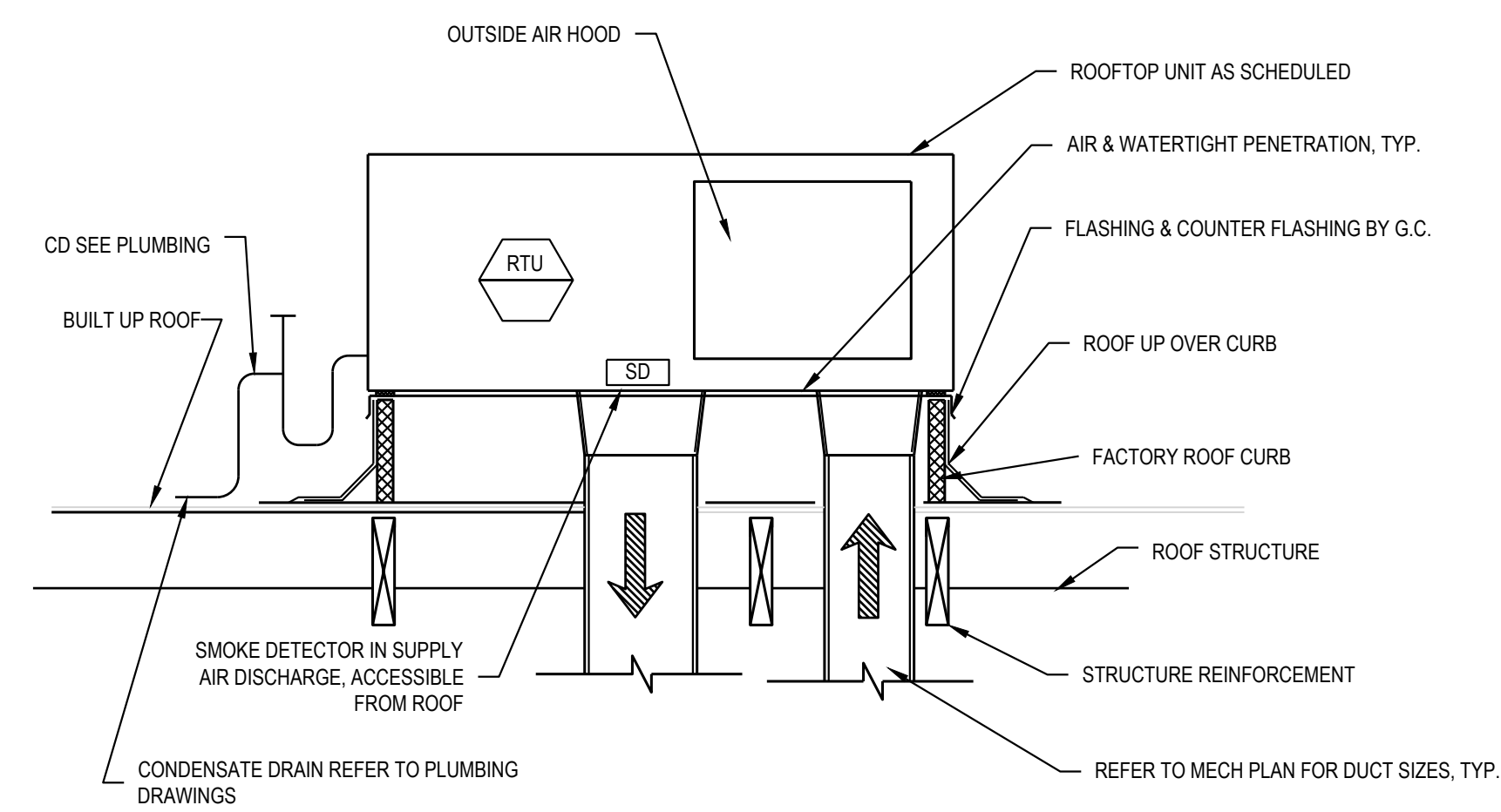
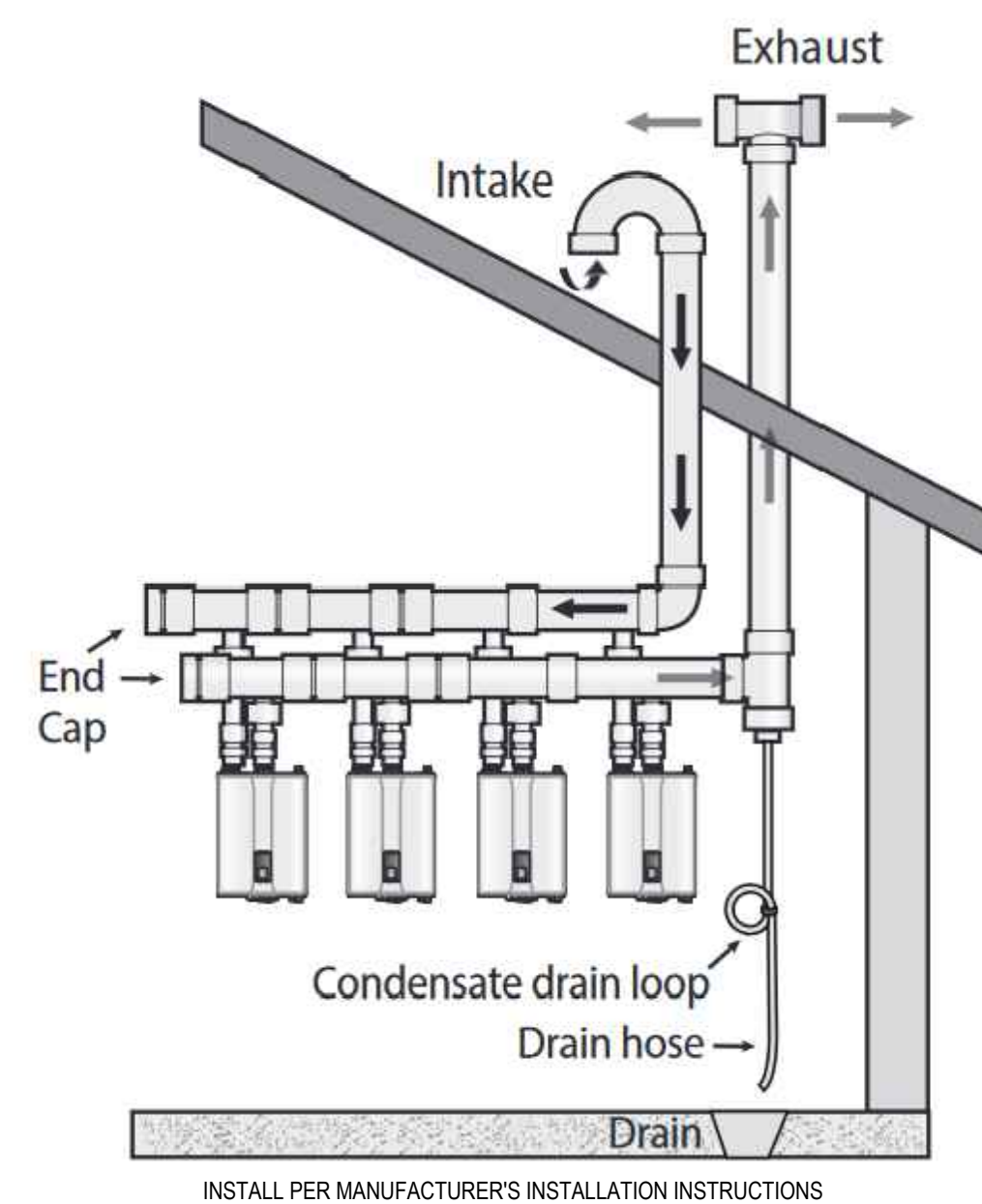
UPPER ATTACHMENT TO EXISTING WOOD STRUCTURE
NOT TO SCALE
3



NOT USED
NOT TO SCALE
8

MUSHROOM TYPE EXHAUST FAN DETAIL
NOT TO SCALE
5

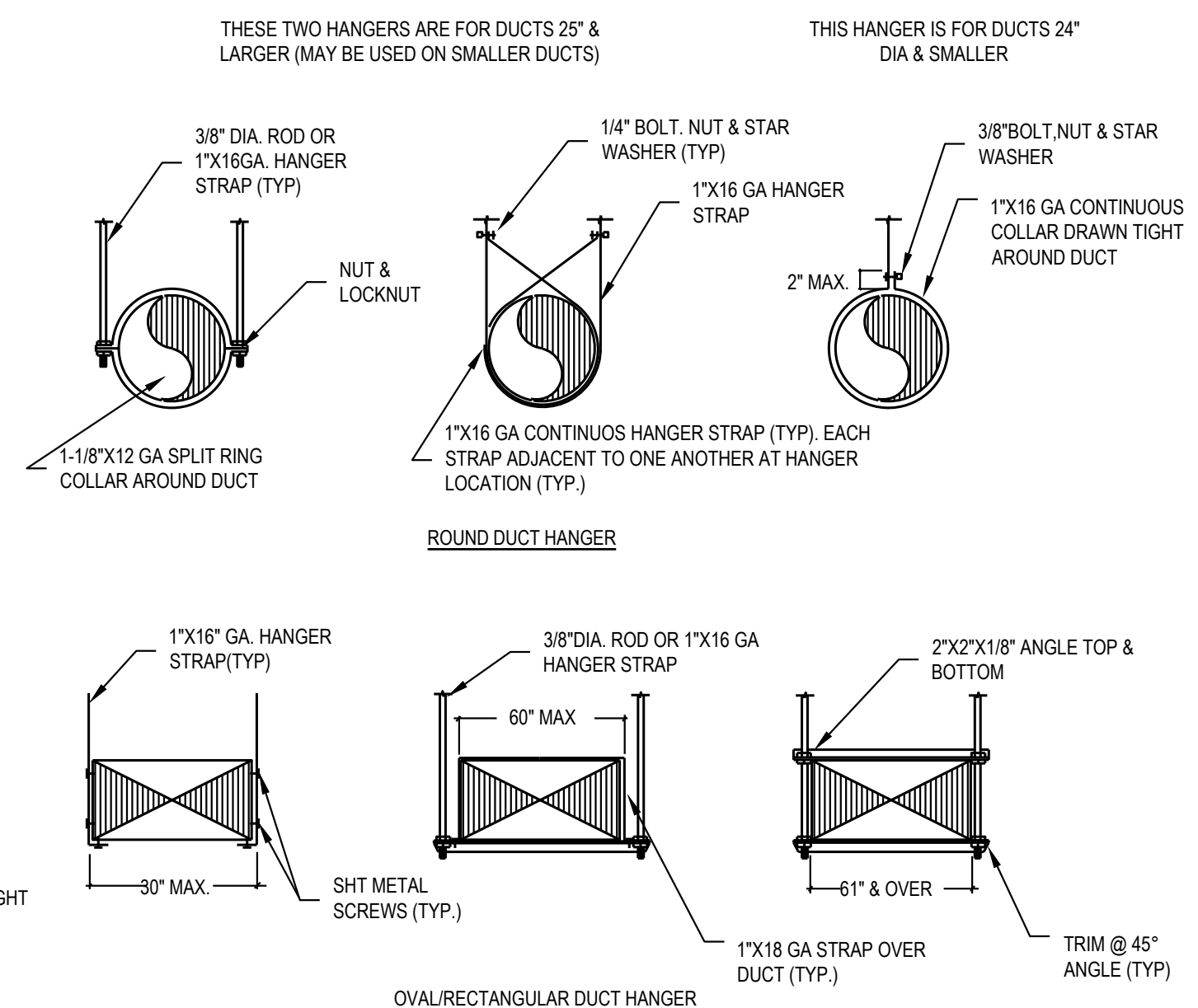
DIFFUSER MOUNTING DETAIL
NOT TO SCALE
2



| SINGLE HANGER MAX LOAD | | |
|----------------------------|------------------------|--|
| STRAP | WIRE OR ROD | |
| 1" X 22 GA. - 260 LBS | (12 GA.) 0.106" 80 LBS | |
| 1" X 20 GA. - 260 LBS | (10 GA.) 0.135" 80 LBS | |
| 1" X 18 GA. - 420 LBS | 0.162" 160 LBS | |
| 1" X 16 GA. - 700 LBS | 1/4" 270 LBS | |
| 1-1/2" X 16 GA. - 1100 LBS | 3/8" 680 LBS | |

| MINIMUM HANGER SIZES FOR ROUND DUCT | | | | |
|-------------------------------------|-----------------|-------------------------|------|-------------|
| DIA. (IN) | MAXIMUM SPACING | WIRE | ROD | STRAP |
| 6-10 | 12" | ONE 12 GA. | 1/4" | 1" X 22 GA. |
| 11-18 | 12" | TWO 12 GA. OR ONE 8 GA. | 1/4" | 1" X 22 GA. |
| 19-24 | 12" | TWO 10 GA. | 1/4" | 1" X 22 GA. |

- NOTES:
- REFER TO SPECIFICATIONS FOR HANGER SPACINGS.
 - ATTACHMENTS TO OVERHEAD STRUCTURE SHALL BE MADE IN ACCORDANCE WITH STRUCTURAL ENGINEERS REQUIREMENTS AND WEIGHT LIMITATIONS. ALL ATTACHMENT METHODS TO STRUCTURE SHALL BE SUBMITTED TO STRUCTURAL ENGINEER FOR REVIEW.



COMMON EXHAUST AND INTAKE FOR WATER HEATER
NOT TO SCALE
7

ROOFTOP UNIT DETAIL
NOT TO SCALE
4

DUCT SUPPORTS
NOT TO SCALE
1

2020-08-14

Mr. Roland Hegmann
Rational AG
Iglinger Str 62
Landsberg, 86899
DE

Dear Mr. Hegmann,

This letter supersedes the letters dated March 15, 2019 and August 13, 2019 relating to models evaluated and represented by the previously conducted Grease Emissions Test (EPA202).

Per your request, project was opened for the evaluation of grease-laden vapors produced from the Model XS 6 2/3, model SCC 102 and model SCC 102/SCC 62 stacked.

The scope of this project was to determine the total grease emissions from cooking quartered roasting chickens weighing 2-1/2 to 3-1/2 lb, skin-on and bone-in as the specified food load as noted in Appendix A of our letter dated August 13, 2019. Testing was conducted in accordance with EPA Method 202 test guidelines to determine ultimate results. Results are used to determine compliance with Section 59 of UL710B, the Standard for Recirculating Systems, formerly Section 14 of UL 197, Eighth Edition, Supplement SB, and paragraph 4.1.1.2 of NFPA96, the Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.

For the record, the test was conducted using the Rational Appliances Model SCC-102, rated 208 V, 37 KW also Model SCC-102, rated 208 / 440 V, 37 KW and Model SCC-62, rated 208 / 440 V, 22.1 KW stacked. The test media, food load and oven programming were taken from UL 710B, section 59. The results are considered to comply with UL710B, Section 59, formerly Section 14 of UL 197, Eighth Edition, Supplement SB, and NFPA96, paragraph 4.1.1.2 when tested with the specified food load and maximum cook times since the total amount of grease-laden effluents collected was less than 5 mg/m² limit. No evaluation was conducted in regards to fire protection.

The ovens tested were considered representative of oven models CMP XS 6 2/3, SCC XS 6 2/3, CM101, CM102, CM61, CM62, CMP101, CMP102, CMP61, CMP62, SCC WE101, SCC WE102, SCC WE61, SCC WE62, SCC101, SCC61, SCC62, and any combination of stacked version from the models noted above, which are rated less than the tested unit and are smaller in size and have less food throughput than the model tested.



Datasheet

iCombi® Classic 6-half size E/G



Capacity

- Six (6) Half-size sheet pans or Six (6) 1/1 GN accessories
- Steam table pans or Six (6) 1/1 GN accessories
- Removable standard hinging rack with 2 5/8 inch rack spacing (68 mm)
- Large selection of accessories for various cooking procedures, such as grilling, broiling or baking
- For use with 1/1, 1/2, 2/3, 1/3 GN accessories

Combi-steam mode

- Steaming 86 °F - 266 °F
- Convection 86 °F - 572 °F
- Combination of steam and convection 86 °F - 572 °F

ClimatePlus

- Climate management - humidity measurement and control
- Humidity setting in 10-% increments

Unit description and functions

Cooking functions

- ClimatePlus: The active climate management in the cooking cabinet, which constantly measures and controls the humidity and guarantees effective dehumidification, combined with high productivity, cooking quality and low energy consumption. Humidity can be adjusted in increments of 10% and monitored via the digital display for precise manual cooking
- Dynamic air circulation in the cooking cabinet through reversing high-performance fan propeller with five fan speeds that can be programmed manually. The optimal energy yield results in excellent uniformity and short cooking times.
- High-performance steam generator for optimal steaming performance even at low temperatures below 212°F
- Integrated, maintenance-free fat separation system without an additional fat filter
- Cool-down function for quick cooling of the cooking cabinet via a fan propeller
- Core temperature measurement via core temperature probe and optional positioning aid (accessories)
- Delta-T cooking for extremely gentle preparation with minimal cooking losses
- Digital temperature display, can be set to °C or °F, displays target and actual values
- Cooking cabinet humidity and time displayed digitally, displays target and actual values
- Individual programming of up to 100 single or multi-stage cooking programs with up to 12 steps
- Individual adjustment of the cooking parameters time, temperature and humidity for a program step during ongoing operation
- Easy transfer of cooking programs to other cooking systems via USB stick.
- Integrated hand shower with automatic retraction and switchable spray/jet function
- Energy-saving, long-lasting LED lighting in the cooking cabinet, with excellent color fidelity to allow quick determination of cooking progress
- No-charge 4-hour RATIONAL certified chef assistance program

Occupational and operating safety

- Electronic safety temperature limiter for steam generator and convection heating
- Integrated fan wheel brake
- Use of Active Green cleaning tabs and Care tabs (solid cleaning agent) for ideal occupational safety levels
- HACCP data memory and output via USB
- Tested according to national and international standards for unsupervised operation
- Maximum tray height must not exceed 63 inch when using a RATIONAL stand
- Ergonomic door handle with right-/left-handed door opening and swing-shut function

Networking

- Integrated, IP-protected USB interface for local data exchange
- Optional integrated IP-protected Ethernet interface
- Optional integrated Wi-Fi interface (incl. Ethernet interface)

Cleaning and care

- Automatic, water pressure-independent cleaning and maintenance system for cooking cabinet and steam generator
- Care system: Automatic cleaning and descaling of the steam generator
- 4 cleaning programs of varying degrees for unsupervised cleaning, including overnight
- Easy and intuitive operation of the cleaning programs: Display of the selected cleaning program, the recommended quantity of tabs and the remaining cleaning time
- Safe ending of the cleaning in the event of a power failure with no cleaning agent left in the cooking cabinet
- Use of phosphate and phosphorus-free Active Green cleaner tabs and care tabs
- Hygienic setup flush with the counter without feet for easy and safe cleaning
- Unit door with rear-ventilated double glass panel and hinged inner pane for easy cleaning

ABBREVIATED SPEC SHEET
1/7



1.1

Technical specifications

Dimensions and weights

| Dimensions (W x H x D) | |
|----------------------------------|---------------------------------|
| Cooking system (body) | 33 1/2 x 29 5/8 x 30 1/2 inches |
| Cooking system (total) | 33 1/2 x 31 5/8 x 33 1/8 inches |
| Cooking system with packaging | 36 3/4 x 37 3/4 x 37 5/8 inches |
| Top rack maximum working height* | ≤ 5 ft. 2 7/8 inches |

*When using an original RATIONAL stand

Weights

| | |
|--|--------|
| Maximum load size per tray | 33 lb |
| Maximum total load capacity | 66 lb |
| Weight - electric unit without packaging | 205 lb |
| Weight - electric unit with packaging | 244 lb |
| Weight - gas unit without packaging | 222 lb |
| Weight - gas unit with packaging | 262 lb |

Electrical connection conditions

| Voltage 3 AC 208 V / 240 V | |
|----------------------------|-------------|
| Connected loads - electric | 10.8 kW |
| Steam power | 9 kW |
| Convection power | 10.25 kW |
| Breaker | 35 A |
| RCD type | B |
| Cable diameter | AWG 8 140°F |

| Voltage 3 AC 440 V / 480 V | |
|----------------------------|--------------|
| Connected loads - electric | 10.8 kW |
| Steam power | 9 kW |
| Convection power | 10.25 kW |
| Breaker | 20 A |
| RCD type | B |
| Cable diameter | AWG 14 140°F |

| Voltage 2 AC 208 V / 240 V | |
|----------------------------|--------------|
| Connected loads - electric | 10.8 kW |
| Steam power | 9 kW |
| Convection power | 10.25 kW |
| Breaker | 60 A |
| RCD type | B |
| Cable diameter | AWG 14 140°F |

| | |
|---------------------|-------------------|
| LAN data interface | RJ45 |
| WiFi data interface | IEEE 802.11 a/g/n |

Minimum distances at installation

Clearance Requirements
To facilitate servicing, we recommend leaving a 20" (500 mm) gap on the left-hand side of the unit. If there is no 20" (500 mm) left side clearance available, provisions for moving the unit to the left for service access must be made. Such provisions include, but are not limited to, having quick connections (water, gas, etc.) and lengthened electrical connections with flexible cords.

If there are no external heat sources acting on the unit, there should be at least 2" (50 mm) of clearance on either side of the unit. The back of the unit can be mounted flush with the wall.

If a high temperature heat source is on the left side of the unit, clearance of at least 14" (350 mm) must be maintained on the left-hand side. This clearance may be reduced to 2" (50 mm) if a heat shield is used (see accessories).

Recommended clearance from unobstructed rear exhaust pipes and any surface collecting grease or flammable material: 16" (400 mm) gas, 10" (254 mm) electric. It is recommended to have a hood overhang of 6" (150 mm) to 18" (450 mm) at the front of the unit and 6" (150 mm) on the sides if installed at the end of the cooking line. Please refer to the Installation Manual for additional technical data and for instructions on installation and setup.

3/4" NPT with 3/4" gas shut off
Additional gas types and voltages available on request

Connected loads - gas

| Voltage 2 AC 208 V | |
|-----------------------|--------|
| Connected loads - gas | 0.6 kW |
| Breaker | 15 A |
| RCD Type | B |

| Voltage 1 NAC 120 V | |
|-----------------------|--------|
| Connected loads - gas | 0.6 kW |
| Breaker | 15 A |
| RCD Type | F |

Connection conditions water

| | |
|--------------------------------------|---------------|
| Water inlet (pressure hose), each | 3/4" |
| Water pressure (flow pressure), each | 14.5-87.0 psi |
| Water drain, each | 2" OD |
| Maximum flow rate per cooking system | 3.17 gal./min |

Water quality requirements

Untreated water can be 0 to 24.5 gr./gal (0 to 420ppm) hardness. We do not recommend treated water hardness < 5 gr./gal (86ppm) because the water could be corrosive. Sodium ion exchangers are not recommended. H+ ion exchange systems are recommended. Water that does not meet the following minimum standards will require the proper conditioning

| Contaminant | Water Requirements | If > than recommended |
|-----------------------------|--------------------------|-----------------------|
| Sand / Particles | < 15 µm | Particle filter |
| Chlorine (Cl ₂) | < 0.12 gr./gal (0.2 ppm) | Active carbon filter |
| Chloride (Cl ⁻) | < 4.68 gr./gal (80 ppm) | RO |

Connected loads - exhaust air and thermal load

| | |
|------------------------|----------|
| Latent heat load | 1943 BTU |
| Sensible heat emission | 2391 BTU |
| Sound level (electric) | 55 dBA |
| Sound level (gas) | 60 dBA |

Connection loads - data

| | |
|---------------------|-------------------|
| LAN data interface | RJ45 |
| WiFi data interface | IEEE 802.11 a/g/n |

Minimum distances at installation

Clearance Requirements
To facilitate servicing, we recommend leaving a 20" (500 mm) gap on the left-hand side of the unit. If there is no 20" (500 mm) left side clearance available, provisions for moving the unit to the left for service access must be made. Such provisions include, but are not limited to, having quick connections (water, gas, etc.) and lengthened electrical connections with flexible cords.

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3/4" NPT with 3/4" gas shut off
Additional gas types and voltages available on request

ABBREVIATED SPEC SHEET
3/7

1.1

iCombi Classic 6-half size E/G



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ARCHITECT OF RECORD:



Dewberry Architects Inc.

300 N. Lake Ave., 12th Floor
Pasadena, Ca. 91101
916.239.4256 Phone
916.2397245 Fax

STAMP:



400 N. McCarthy Blvd., Ste 205
Milpitas, CA 95035
ph: (408) 522-5255
fx: (408) 522-5260
info@acies.net
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2020-08-26

Specification/Data sheet

UltraVent Plus models 6-half size, 10-half size US



1.1

Article number: 60.76.177

Description

The UltraVent Plus gets rid of escaping steam with its condensation technology. It is also equipped with special filter technology which reduces lingering smoke, which can build up while grilling and frying. No connection to the outside or extension of an existing exhaust system is necessary with this air recirculation hood. Installation is simple, and the hood can be retrofitted at any time.

Features

- Intelligent power control with automatic, continuously variable adjustment of the extraction power to the quantity of steam emitted
- Automatically boosts extraction rate when cooking cabinet door is opened
- Connects to both iCombi cooking systems in a Combi-Duo
- Eliminates lingering steam and vapours. These are extracted and condensed in the hood
- Special filter technology with a prefilter and HEPA H13 main filter to reduce smoke
- Easy to install and retrofit
- Issue of service notifications on the display of the iCombi Pro and iCombi Classic
- Adjustment of maximum extraction power on the display
- Easy to clean baffle plate, dishwasher safe

Technical Specifications

- Connection: 120V - 1 NAC 50/60 Hz
- Connected load: 170 W
- Extraction capacity: 24900 ft³/h
- Operating noise level: min 50 dBA; max 65 dBA
- Width: 33 5/8 inches
- Height: 15 7/8 inches
- Depth: 38 3/8 inches
- Weight: 174 lbs

Material

- Rust-free stainless steel (CNS 1.4301)

Note

- To install an UltraVent, UltraVent Plus or exhaust hood on a SelfCookingCenter (from 09/2011) or CombiMaster Plus, a corresponding adapter kit is required
- The local standards and regulations for ventilation systems must be adhered to
- Only permitted for installation on electrical units

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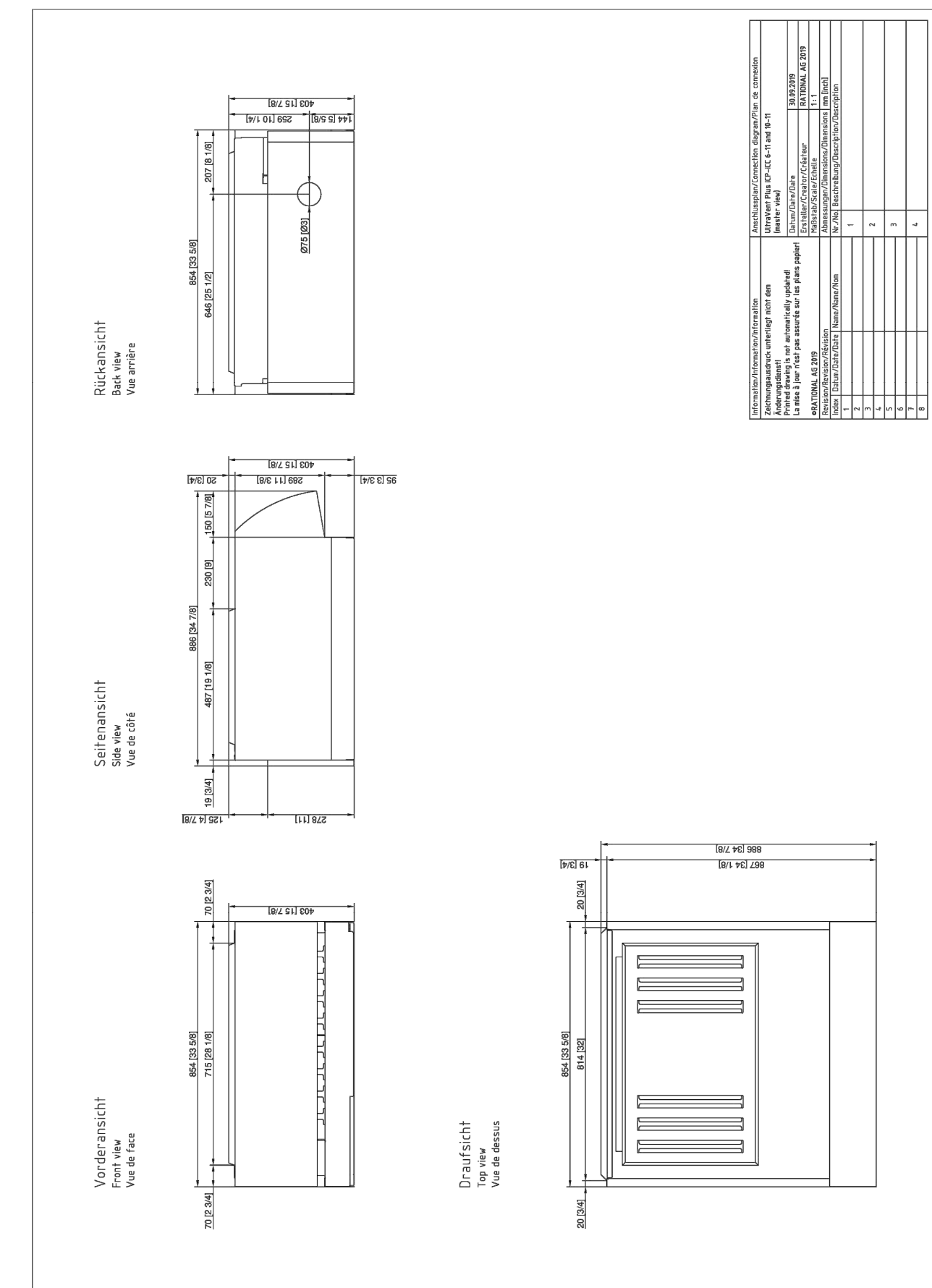
2020-08-26

Specification/Data sheet

UltraVent Plus models 6-half size, 10-half size US



1.1



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21434 HAWTHORNE BLVD
SUITE 605A
TORRANCE, CA 90503

DRAWN BY: ACIES
CHECKED BY: GP/DY
PROJECT MANAGER: EN
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REVISIONS
REV. DATE DESCRIPTION
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C 03/25/22 IFC
D 05/04/22 BULLETIN 1
06/30/22 KITCHEN UPDATES

MECHANICAL DETAILS

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ARCHITECT OF RECORD:



Dewberry Architects Inc.

300 N. Lake Ave, 12th Floor
Pasadena, Ca. 91101
916.239.4256 Phone
916.2397245 Fax

STAMP:

ACIES
ENGINEERING

400 N. McCarthy Blvd, ste 250
Milpitas, CA 95035
ph: (408) 522-5255
fx: (408) 522-5260
info@acies.net
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| A | 10/25/21 | PERMIT SET |
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| C | 03/25/22 | IFC |
| D | 05/04/22 | BULLETIN 1 |
| | 06/30/22 | KITCHEN UPDATES |

HOOD DETAILS

M-500

FOR QUESTIONS, CALL THE
Highwoods Group
REGION 40
PHONE: (919) 875-0420
EMAIL: reg40@captiveaire.com

HOOD INFORMATION - JOB#5364822

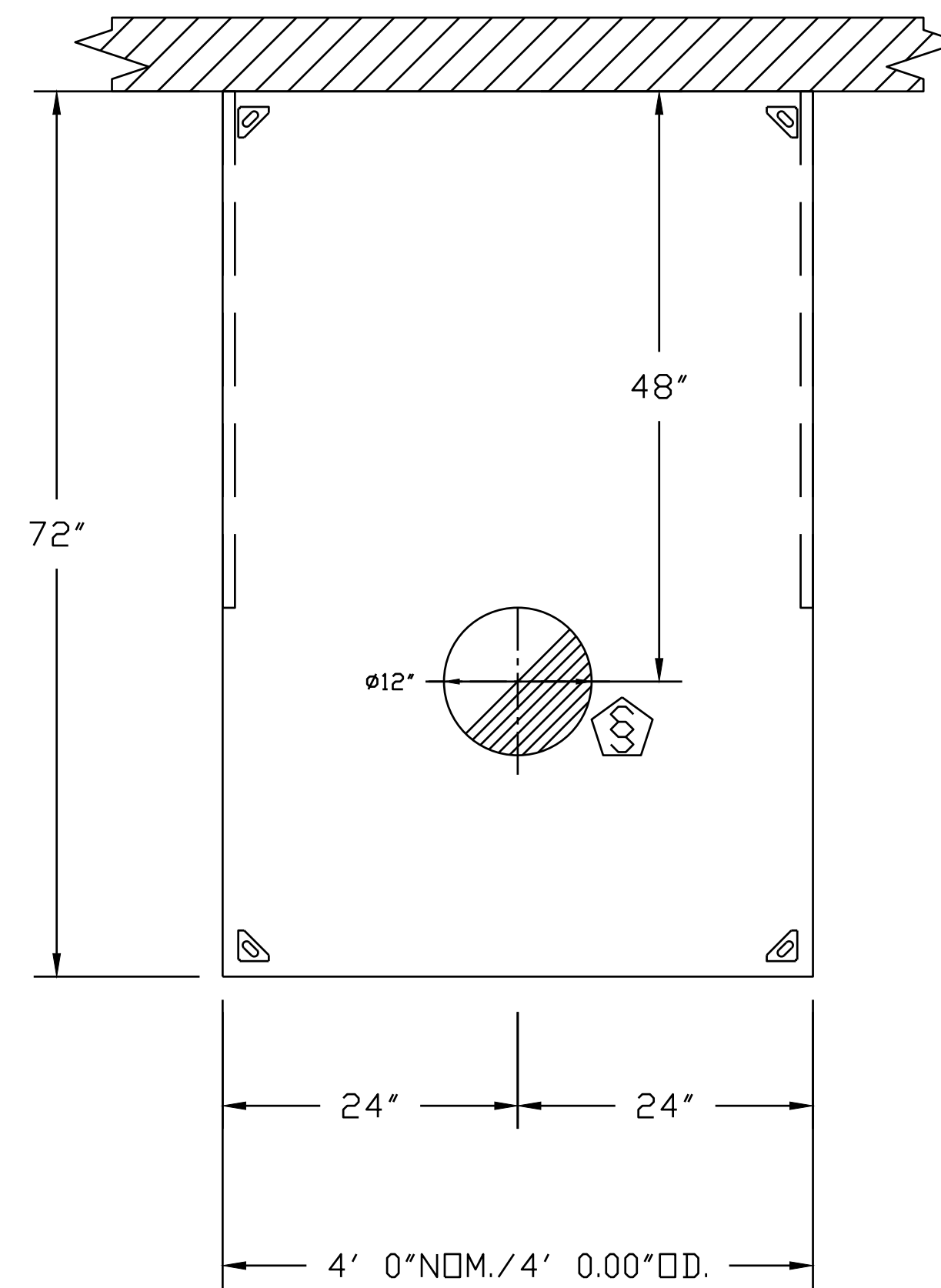
| HOOD NO | TAG | MODEL | MANUFACTURER | LENGTH | MAX COOKING TEMP | TYPE | APPLIANCE DUTY | DESIGN CFM/FT | TOTAL EXH CFM | EXHAUST PLENUM RISER(S) | | | | | | HOOD CONSTRUCTION | HOOD CONFIG | | |
|---------|-----|----------|--------------|--------|------------------|------|----------------|---------------|---------------|-------------------------|------|--------|-----|-----|------|-------------------|----------------|------------|-------|
| | | | | | | | | | | WIDTH | LENG | HEIGHT | DIA | CFM | VEL | | SP | END TO END | ROW |
| 1 | | 7224 VHB | CAPTIVEAIRE | 4' 0" | 700 DEG | II | N/A | 200 | 800 | | | 4" | 12" | 800 | 1019 | -0.118" | 430 SS 100% | ALONE | ALONE |

HOOD INFORMATION

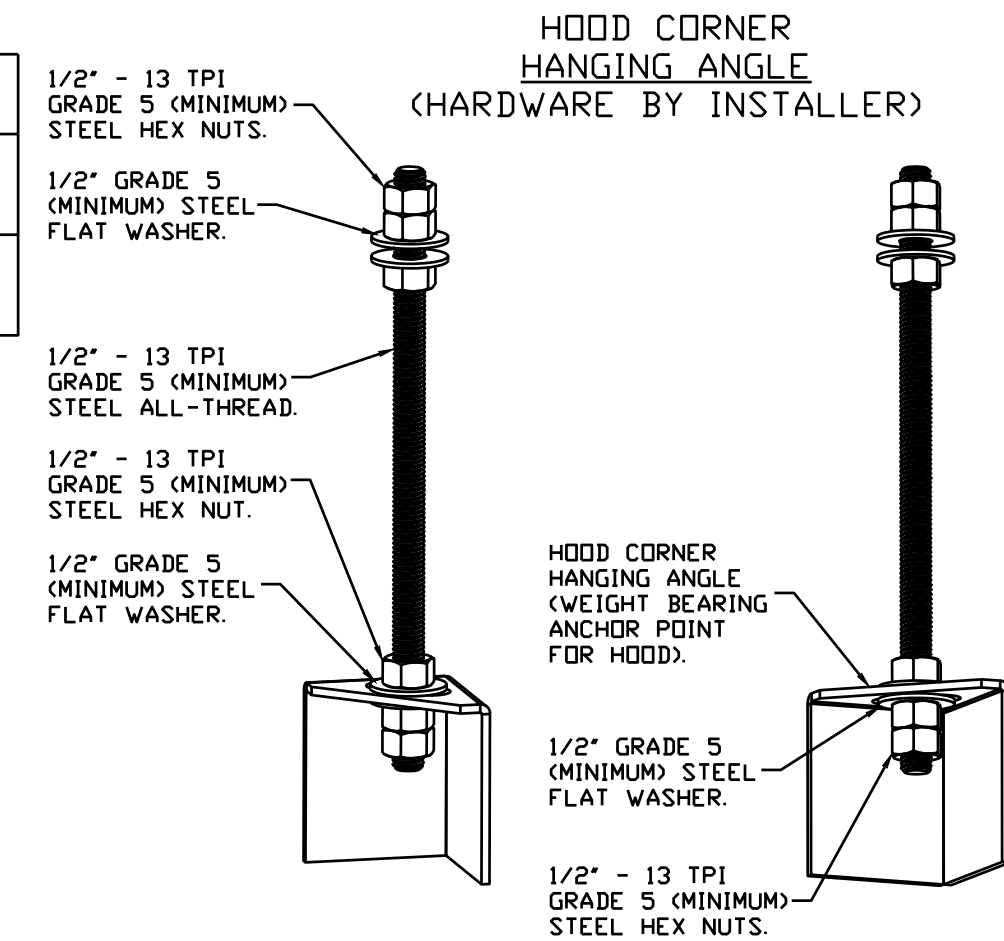
| HOOD NO | TAG | FILTER(S) | | | | LIGHT(S) | | | | UTILITY CABINET(S) | | | | FIRE SYSTEM PIPING | HOOD HANGING WEIGHT | |
|---------|-----|-----------|-----|--------|--------|------------------------|-----|------|------------|--------------------|------|-------------|------------|--------------------|---------------------|----------|
| | | TYPE | QTY | HEIGHT | LENGTH | EFFICIENCY @ 7 MICRONS | QTY | TYPE | WIRE GUARD | LOCATION | SIZE | FIRE SYSTEM | ELECTRICAL | | | SWITCHES |
| 1 | | | | | | | 0 | | | | | | | | NO | 345 LBS |

HOOD OPTIONS

| HOOD NO | TAG | OPTION |
|---------|-----|---|
| 1 | | RIGHT WIDE VERTICAL END PANEL 42" TOP WIDTH, 36" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS. |
| | | LEFT WIDE VERTICAL END PANEL 42" TOP WIDTH, 36" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS. |

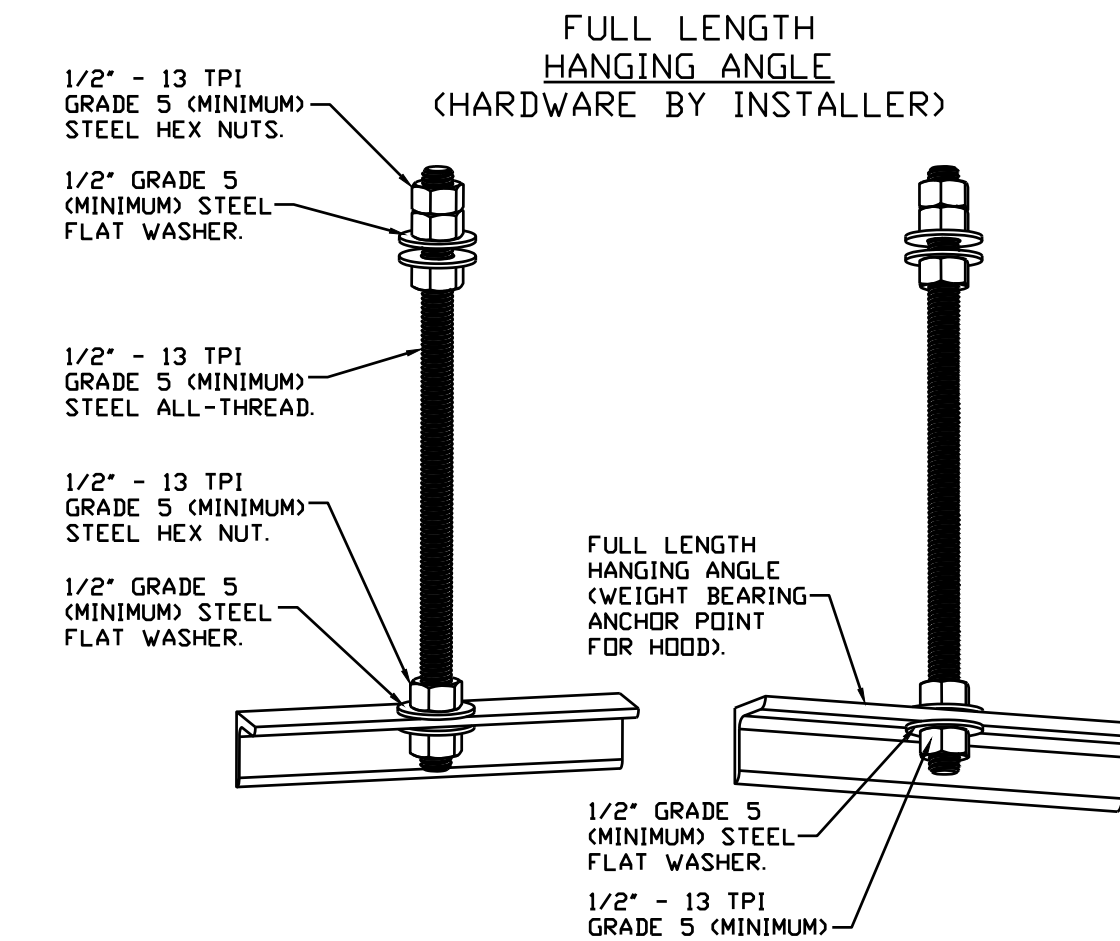


PLAN VIEW - HOOD #1
4' 0.00" LONG 7224VHB



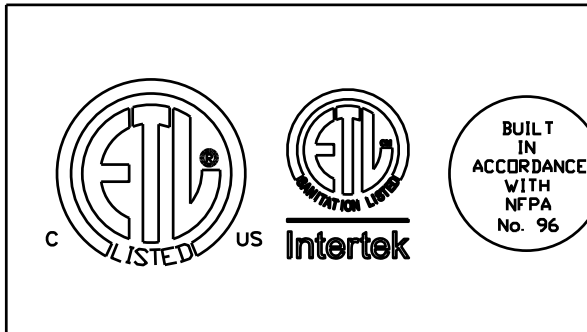
ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION BENEATH HOOD HANGING ANGLES AND ABOVE CEILING ANCHORS. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.



ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION ABOVE CEILING ANCHORS. SINGLE HEX NUT BENEATH HANGING ANGLE IS ACCEPTABLE FOR FULL LENGTH HANGING ANGLES. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.



| | |
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| DWG # 1 | DRAWN BY JMB-40 |
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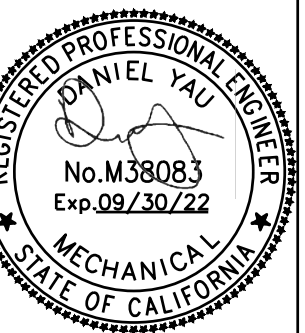


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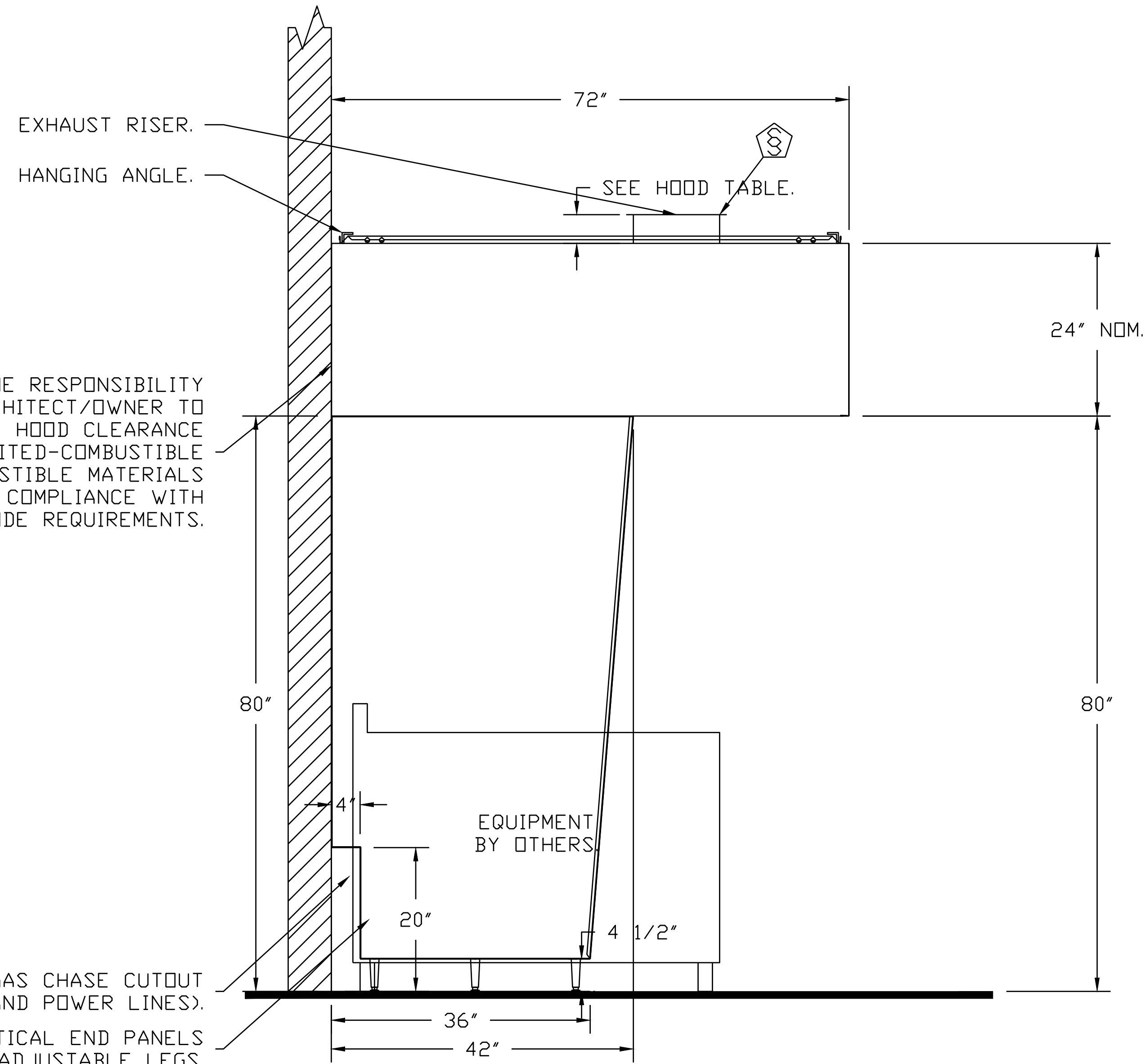
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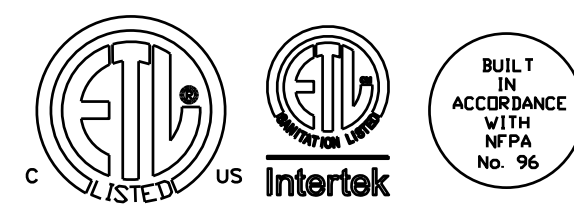
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HOOD DETAILS

M-501



SECTION VIEW - MODEL 7224VHB
HOOD - #1



| | |
|----------------------------------|--------------------|
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| DWG # 2 | DRAWN BY JMB-40 |
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SECTION 23 38 13 13

SPECIFICATIONS

TAG: Commercial Kitchen Ventilation Hoods, Listed Commercial Kitchen Hoods

PART 1 - GENERAL

1.1 SUMMARY

- A. The VHB Series is a Premier Type II, exhaust only hood used over equipment not producing grease laden vapors. Type II hoods are used for condensation or heat removal applications.
- B. The hood shall have the size, shape, and performance specified on drawings.

1.2 SUBMITTALS

- A. The manufacturer assumes no liability for the use or results of use from this document. Specifications are to be reviewed by the engineer to confirm the project's requirements and meet Federal, State, and Local codes and regulations.
- B. As the manufacturer continues product development, it reserves the right to change design and specifications without notice.
- C. The manufacturer shall supply complete computer generated submittal drawings, including hood section view(s) and hood plan view(s). These drawings must be available to the engineer, architect, and owner for their use in construction, operation, and maintenance.

1.3 QUALITY ASSURANCE

- A. This hood is ETL-listed to standard UL710, ULC710, and ULC-S646 when installed in accordance with these installation instructions and National Fire Protection Association Standard NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations."
- B. Built-in compliance with NSF/ANSI Standard 2.
- C. The hood shall be ETL Listed as:
 1. "Exhaust Hood Without Exhaust Damper."
 2. ETL Sanitation Listed and built in accordance with NFPA 96.
 3. The ETL label shall list temperature rating(s) and minimum CFM/ft rating(s).

1.4 WARRANTY

- A. All units shall be provided with the following standard warranty:
 1. This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 2-years from date of shipment.
- B. The manufacturer shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 2-year warranty period, upon examination by the manufacturer, such part will be repaired or replaced by manufacturer at no charge. The buyer shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without manufacturer's prior authorization, and all returned equipment shall be shipped by the buyer, freight prepaid to a destination determined by the manufacturer.
- C. Refer to Manufacturer's Operation, Installation, and Maintenance (OIM) Manual for detailed descriptions of what is/is not covered and contact information for warranty claims.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Construction shall be dependent on the structural application to minimize distortion and other defects. All seams, joints, and penetrations of the hood enclosure to the lower outermost perimeter, which directs and captures grease-laden vapor and exhaust gases, shall have a liquid-tight continuous external weld in accordance with NFPA 96.
- B. Duct sizes, CFM, and static pressure requirements shall be as shown

on drawings. Static pressure requirements shall be precise and accurate; air velocity and volume information shall be accurate within 1-ft increments along the length of the ventilator.

2.2 CONSTRUCTION

- A. Construction shall be type 430 stainless steel.
- B. Hood shall be equipped with a minimum of four connections for hanger rods. Hood lengths greater than 12' will have added hangers.
- C. Exhaust duct collar to be 4" high with flange.
- D. All seams shall be welded and have stainless steel on exposed surfaces.

2.3 ACCESSORIES

- A. End Panel(s) maximize hood performance and eliminate the effects of cross drafts in the kitchen. Units constructed of stainless steel and sized according to hood width and cooking equipment. Exposed edges hemmed for safety and rigidity. Selected panels:
 1. Wide Vertical End Panel

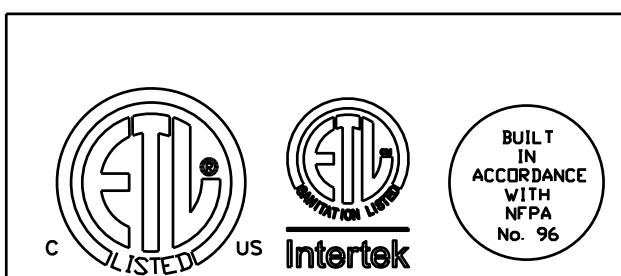
PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions under which the system is installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

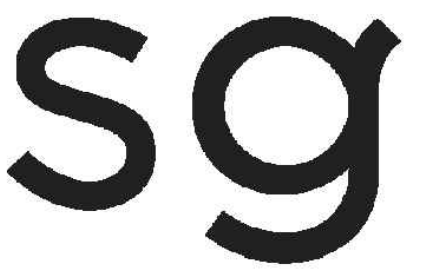
3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions, drawings, written specifications, manufacturer's installation manual, and all applicable building codes.



| | |
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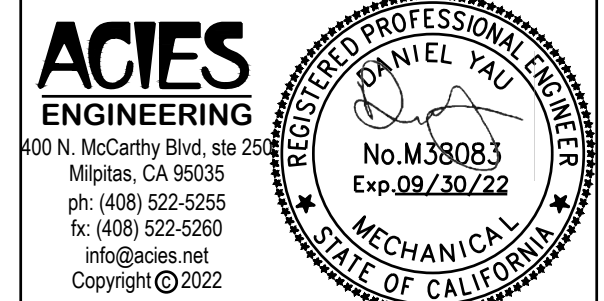
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HOOD DETAILS

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06/30/22 KITCHEN UPDATES

HOOD DETAILS

M-503

EXHAUST FAN INFORMATION - JOB#5364822

| FAN UNIT NO | TAG | QTY | FAN UNIT MODEL # | MANUFACTURER | CFM | ESP | RPM | MOTOR ENCL | HP | BHP | PHASE | VOLT | FLA | DISCHARGE VELOCITY | WEIGHT (LBS) | SONES |
|-------------|------|-----|------------------|--------------|-----|-------|------|------------|-------|--------|-------|------|-----|--------------------|--------------|-------|
| 1 | EF-1 | 1 | DU50HFA | CAPTIVEAIRE | 800 | 0.600 | 1333 | TEAD-ECM | 0.500 | 0.2430 | 1 | 115 | 6.3 | 304 FPM | 74 | 12.7 |

FAN OPTIONS

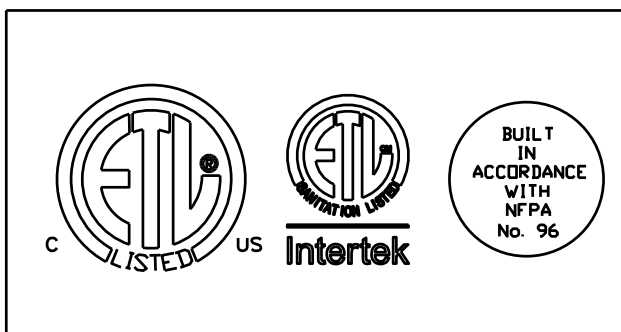
| FAN UNIT NO | TAG | QTY | DESCRIPTION |
|-------------|------|-----|--|
| 1 | EF-1 | 1 | ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL (TELCO MOTOR), CCW ROTATION |
| | | 1 | 1 15-BDD DAMPER |
| | | 1 | 2 YEAR PARTS WARRANTY |

FAN ACCESSORIES

| FAN UNIT NO | TAG | EXHAUST | | | | SUPPLY | | | |
|-------------|------|------------|----------------|------------|----------------|----------------|------------------|------------|--|
| | | GREASE CUP | GRAVITY DAMPER | WALL MOUNT | SIDE DISCHARGE | GRAVITY DAMPER | MOTORIZED DAMPER | WALL MOUNT | |
| 1 | EF-1 | | YES | | | | | | |

CURB ASSEMBLIES

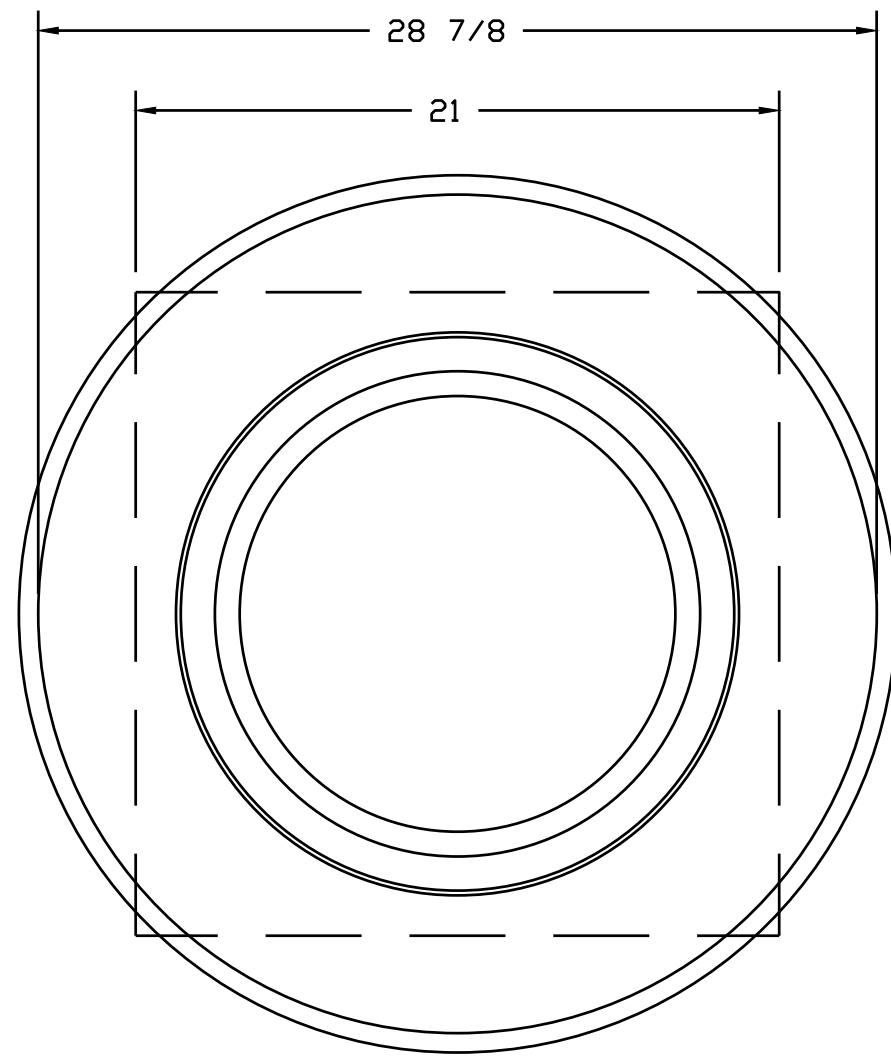
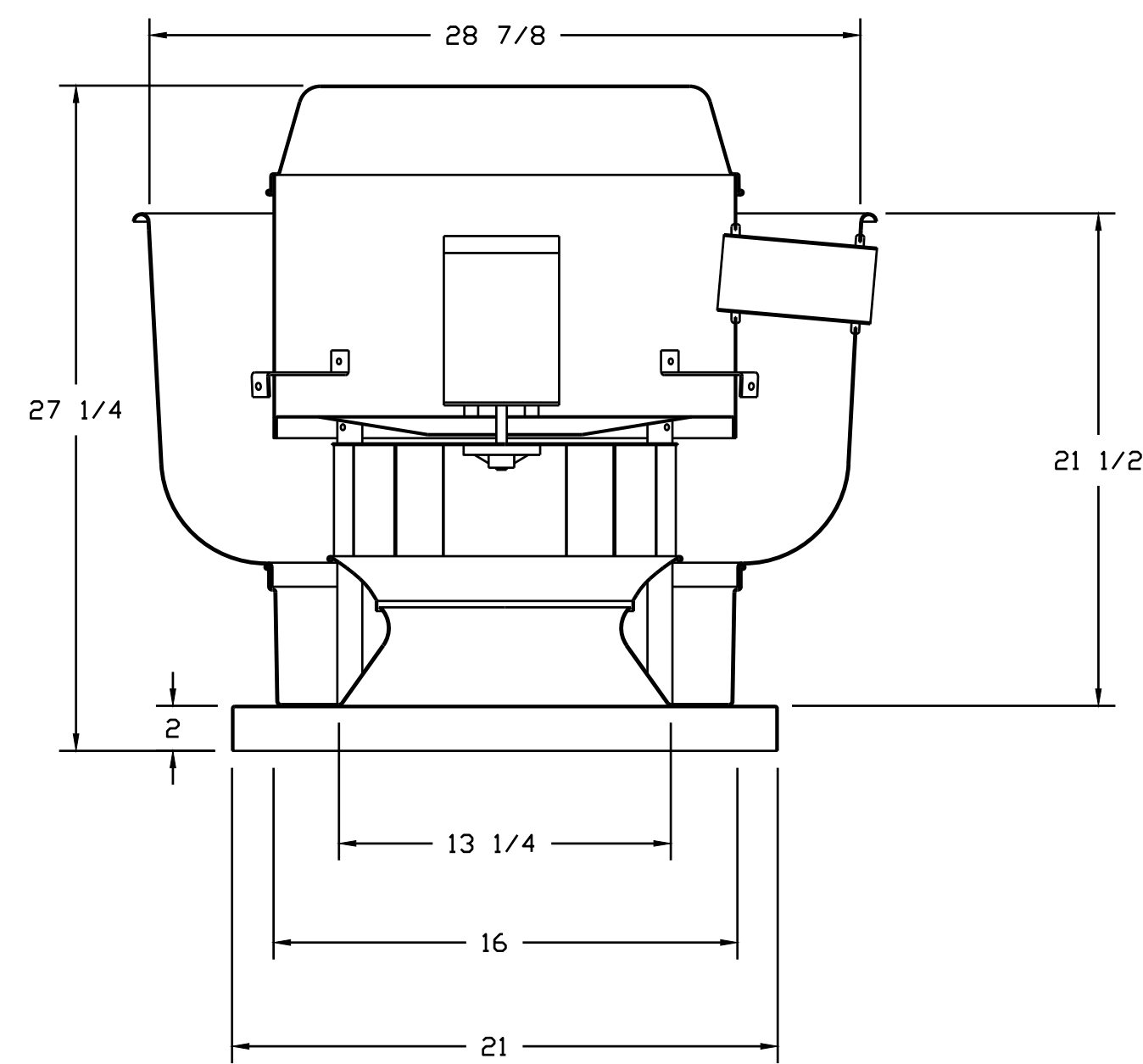
| NO | ON FAN | TAG | WEIGHT | ITEM | SIZE |
|----|--------|------|--------|------|---|
| 1 | # 1 | EF-1 | 31 LBS | CURB | 19.500"W X 19.500"L X 20.000"H ALONG LENGTH, RIGHT VENTED HINGED. |



| | |
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| LOCATION TORRANCE, CA, 90503 | |
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| DWG # 4 | DRAWN BY JMB-40 |
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FAN #1 DU50HFA - EXHAUST FAN (EF-1)



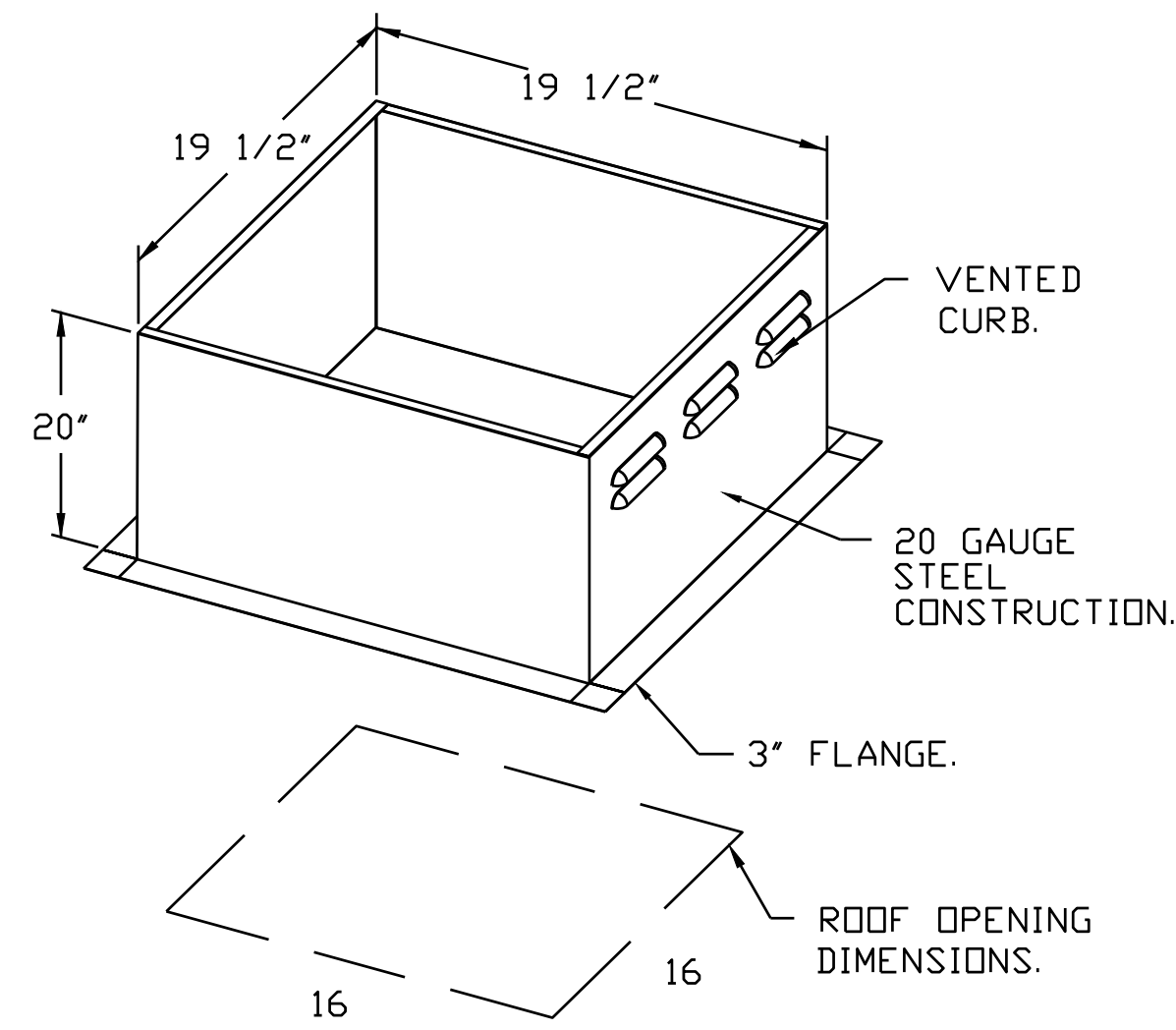
TOP VIEW

FEATURES:

- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- UL705.
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- NEMA 3R SAFETY DISCONNECT SWITCH.

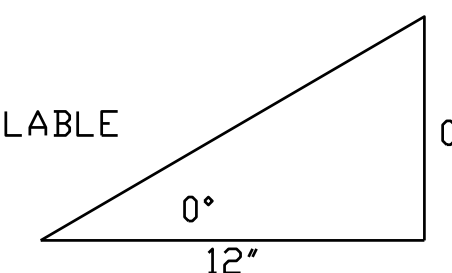
OPTIONS

ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL (TELCO MOTOR), CCW ROTATION.
 I 15-BDD DAMPER.
 2 YEAR PARTS WARRANTY.

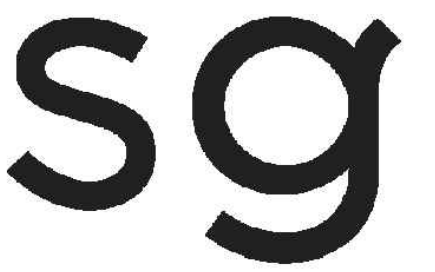
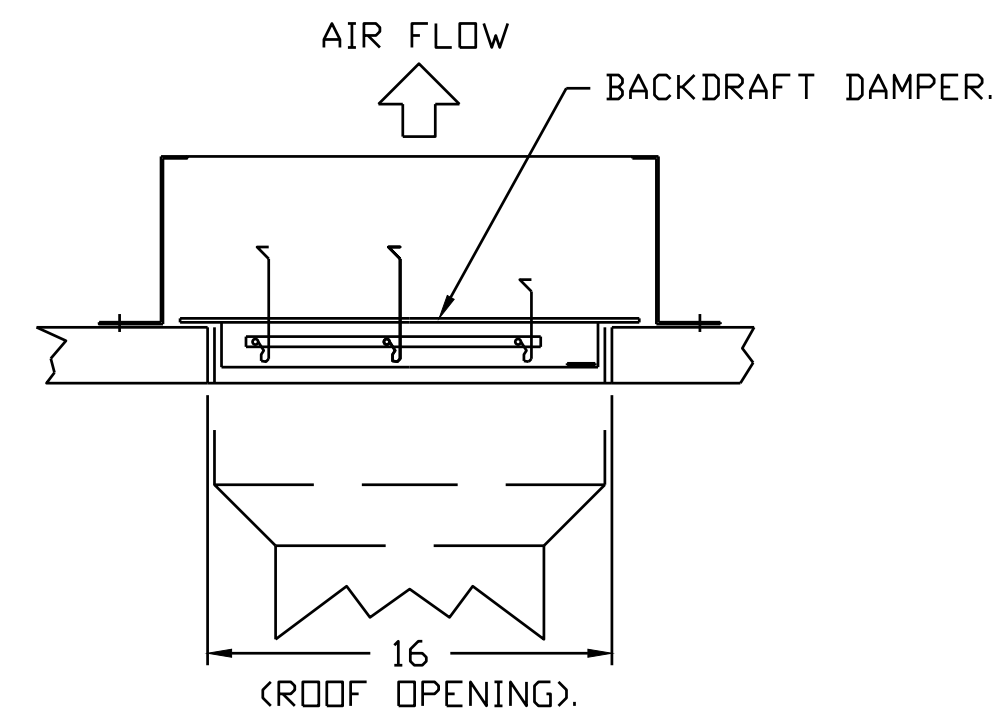


PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.

SPECIFY PITCH:
 EXAMPLE: 7/12 PITCH = 30° SLOPE.



BACKDRAFT DAMPER INSTALLATION



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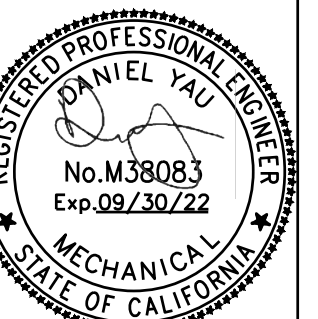
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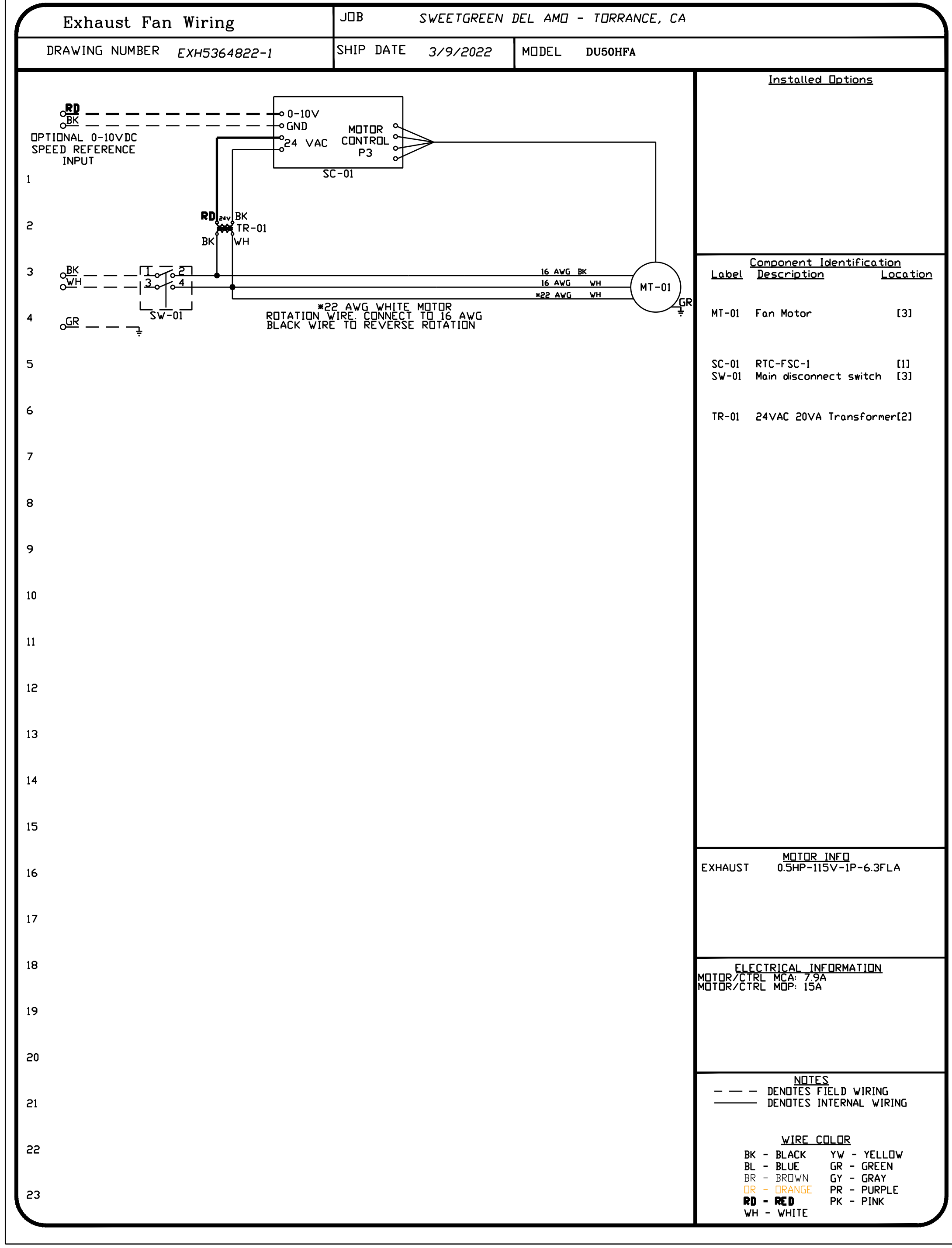
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| | |
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| JOB SWEETGREEN DEL AMO, TORRANCE | |
| LOCATION TORRANCE, CA, 90503 | |
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| DWG # 5 | DRAWN BY JMB-40 |
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HOOD DETAILS

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