4.2.2 Equipment Efficiency §110.2(a)
All space conditioning equipment installed in a nonresidential building subject to these regulations must be certified as meeting certain minimum efficiency and control requirements. These requirements are contained in §110.2 of the Standards. Minimum efficiencies vary based on the type and capacity of the equipment. The following Tables, which are based from Tables 110.2A-110.2K of the Standards, list the different minimum efficiencies.

4.2.3 Equipment not covered by the Appliance Efficiency Regulations is regulated by §110.2 and §110.3. To comply, equipment specified in the plans and specifications must meet the minimum standards mandated in that section. Manufacturers of equipment not regulated by the Appliance Efficiency Regulations are not required to certify their equipment to the Energy Commission; it is the responsibility of the designer and contractor to specify and install equipment that complies. To verify certification, use one of the following options: A. The Energy Commission's website includes listings of energy efficient appliances for several appliance types. The website address is http://www.energy.ca.gov/efficiency/appliances. The Energy Commission's Hotline staff can provide further assistance 1-800-772-3300 or (916) 654-5106 if not found on the website. B. The complete appliance database can be downloaded. This requires spreadsheet programs compatible with Microsoft EXCEL. To use the data, a user must download the database file (or files), download a brand file and a manufacturer file and then decompress the files. Next, the user will need to download a description file that provides details on what is contained in each of the data fields. With these files, and using database software, the data can be sorted and manipulated. C. The Air Conditioning, Heating and Refrigeration Institute (AHRI) Directory of Certified Products can be used to verify certification of air-conditioning equipment. This is available on their website at www.ahrinet.org.

4.2.4 Controls for Heat Pumps with Supplementary Electric Resistance Heaters §110.2(b)
The Standards discourages the use of electric resistance heating when an alternative method of heating is available. In the case of a heat pump, these systems may contain electric resistance heat strips which act as a supplemental heating source. If this system is to be used then controls must be put in place that limits the use of the electric resistance to not operate when the heating load can be satisfied with the heat pump alone. This includes the requirement that the thermostat must be able to provide step up controls that will incrementally adjust the indoor temperature setting so that the heat pump can gradually raise the temperature until the final desired indoor temperature is reached. Also, the controls must set a "cut-on" temperature for compressor heating which is higher than the "cut-on" temperature for electric resistance heating, and the "cut-off temperature for compression heating is higher than the "cut-off" temperature for electric resistance heating. Several exceptions exist for this requirement; if the electric resistance heating is for defrost, star-ups and follows the room thermostat set points (or another control mechanism designed to preclude the unnecessary operation) or the heat pump is a room air-conditioner heat pump.

4.2.5 Thermostats §110.2(c) and §120.2(b)4
When a central energy management control system is not included in the design of the HVAC system, then a thermostat with setback capabilities must be installed. This requirement applies to all unitary heating or cooling systems, which includes heat pumps, to have a thermostat that is capable of at least 4 set points in a 24 hour period. In the case of a heat pump the control requirements of section 4.24 must also be met. In addition, per §120.2(b)4, all unitary single zone, air conditioners, heat pumps, and furnaces, the thermostat must comply with the requirements of Reference Joint Appendix JA5, 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. There are two exceptions to 120.2(b)4 Occupant Controlled Smart Thermostats: 1. Systems serving zones that must have constant temperatures to protect a process or product (e.g. a laser laboratory or a museum). 2. The following HVAC systems do not need to comply with the setback thermostat requirement: a. Gravity gas wall heaters, b. Gravity floor heaters, c. Gravity room heaters, d. Non-central electric heaters, e. Fireplaces or decorative gas appliance, f. Wood stoves, g. Room air conditioners, h. Room heat pumps

4.2.6 Furnace Standby Loss Controls §110.2(d)
Forced air gas- and oil-fired furnaces with input ratings ≥225,000 Btu/h are required to have controls and designs that limit their standby losses: A. They must have either an intermittent ignition or interrupted device (IID). Standing pilot lights are not allowed. B. They must have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for furnaces where combustion air is drawn from the conditioned space. Any furnace with an input rating ≥225,000 Btu/h that is not located within the conditioned space must have jacket losses not exceeding 0.75 percent of the input rating. This includes electric furnaces as well as fuel-fired units.

B. Low Leakage Air Handling Unit (AHU) §110.2(f), §140.1 and §150.1(b)
The standard provides a compliance credit for low leakage AHUs. To achieve this credit you must meet the qualifications in Reference Joint Appendix JA9 and verify installation in accordance with the procedures specified in Reference Residential Appendix RA3.1.4.3.9. In order for an AHU to qualify as low leakage the AHU manufacturer must certify to the Energy Commission that the AHU complies with AHRAE Standard 193. Once installed the AHU and distribution system is pressurized and the leakage measured according to the testing methods in RA 3.1.4.3.1. The credit is achieved by specifying the leakage amount in the approved compliance software which would use the inputted amount of duct leakage rather than use the default duct leakage rates that are based on either new or altered ducts.

4.3 Ventilation Requirements §120.1
4.3.2 Mechanical Ventilation §120.1(b)2 and (d)
Mechanical outdoor ventilation must be provided for all spaces normally occupied that are not naturally ventilated. The Standards require that a space conditioning system provide outdoor air equal to or exceeding the ventilation rates required for each of the spaces that it serves. At the space, the required ventilation can be provided either directly through supply air or indirectly through transfer of air from the plenum or an adjacent space. The required minimum ventilation airflow at the space can be provided by an equal quantity of supply or transfer air. At the air-handling unit, the minimum outside air must be the sum of the ventilation requirements of each of the spaces that it serves. The designer may specify higher outside air ventilation rates based on the owner's preference or specific ventilation needs associated with the space. However, specifying more ventilation air than the minimum allowable ventilation rates increases energy consumption and electrical peak demand and increases the costs of operating the HVAC equipment. Thus the designer should have a compelling reason to specify higher design minimum outside air rates than the calculated minimum outside air requirements in the Standards. In the 2013 revision to the Standards the minimum OSA provided is required to be within 10 percent of the calculated minimum for both VAV and constant volume units. A. In summary: 1. Ventilation compliance at the space is satisfied by providing supply and/or transfer air (exception to
K. Isolation Area Controls §120.2(g)
Large space-conditioning systems serving multiple zones may waste considerable quantities of energy by conditioning all zones when only a few zones are occupied. Typically, this occurs during evenings or weekends when only a few people are working. When the total area served by a system exceeds 25,000 ft², the Standards require that the system be designed, installed and controlled with area isolation devices to minimize energy consumption during these times. The requirements are: 1. The building shall be divided into isolation areas, the area of each not exceeding 25,000 ft². An isolation area may consist of one or more zones. 2. An isolation area cannot include spaces on different floors. 3. Each isolation area shall be provided with isolations devices such as valves or dampers that allow the supply of heating or cooling to be setback or shut off independently of other isolation areas. 4. Each isolation area shall be controlled with an automatic time switch, occupancy sensor, or manual timer. The requirements for these shut-off devices are the same as described previously in §120.2(e)1. As discussed previously for occupancy sensors, a building purge must be incorporated into the control sequences for normally occupied spaces, so occupancy sensors and manual timers are best limited to use in those areas that are intermittently occupied. Any zones requiring continuous operation do not have to be included in an isolation area.
L. Isolation of Zonal Systems Small zonal type systems such as water loop heat pumps or fan coils may be grouped on automatic time switch devices, with control interlocks that start the central plant equipment whenever any isolation area is occupied. The isolation requirements apply to equipment supplying heating and cooling only; central ventilation systems serving zonal type systems do not require these devices. M. Isolation of Central Air Systems Figure 4-13 below depicts four methods of area isolation with a central variable air volume system: 1. On the lowest floor, programmable DDC boxes can be switched on a separate time schedule for each zone or blocks of zones. When unoccupied, the boxes can be programmed to have zero minimum volume setpoints and unoccupied setback/setup setpoints. Note this form of isolation can be used for sections of a single floor distribution system. 2. On the second floor, normally closed pneumatic or electric VAV boxes are used to isolate zones or groups of zones. In this scheme the control source (pneumatic air or control power) for each group is switched on a separate control signal from an individual time schedule. Again this form of isolation can be used for sections of a single floor distribution system. 3. On the third floor isolation is achieved by inserting a single motorized damper on the trunk of the distribution ductwork. With the code requirement for fire/smoke dampers (see next bullet) this method is somewhat obsolete. When applied this method can only control a single trunk duct as a whole. Care must be taken to integrate the motorized damper controls into the fire/life safety system. 4. On the top floor a combination fire smoke damper is controlled to provide the isolation. Again this control can only be used on a single trunk duct as a whole. Fire/smoke dampers required by code can be used for isolation at virtually no cost provided that they are wired so that the fire life-safety controls take precedence over off-hour controls. (Local fire officials generally allow this dual usage of smoke dampers since it increases the likelihood that the dampers will be in good working order in the event of a fire.) Note that no isolation devices are required on the return.
N. Turndown of Central Equipment Where isolation areas are provided it is critical that the designer design the central systems (fans, pumps, boilers and chillers) to have sufficient stages of capacity or turndown controls to operate stably as required to serve the smallest isolation area on the system. Failure to do so may cause fans to operate in surge, excessive equipment cycling and loss of temperature control. Schemes include: 1. Application of demand based supply pressure reset for VAV fan systems. This will generally keep variable speed driven fans out of surge and can provide 10:1 turndown. 2. Use of pony chillers, an additional small chiller to be used at partial load conditions, or unevenly split capacities in chilled water plants. This may be required anyway to serve 24/7 loads. 3. Unevenly split boiler plants.

§120.1(b)2). 2. Ventilation compliance at the unit is satisfied by providing, at minimum, the outdoor air that represents the sum of the ventilation requirements at each space that it serves. B. For each space requiring mechanical ventilation the ventilation rates must be the greater of either: 1. The conditioned floor area of the space, multiplied by the applicable minimum ventilation rate from the Standards in Table 120.1-A (2. 3. Table 4-12). This provides dilution for the building-borne contaminants like off-gassing of paints and carpets.
4. 15 cfm per person, multiplied by the expected number of occupants. For spaces with fixed seating (such as a theater or auditorium), the expected number of occupants is the number of fixed seats. For spaces without fixed seating, the expected number of occupants is assumed to be no less than one-half that determined for egress purposes in the California Building Code (CBC). The Standards specify the minimum outdoor ventilation rate to which the system must be designed. If desired, the designer may, with documentation, elect to provide more ventilation air. For example, the design outdoor ventilation rate may be determined using the procedures described in ASHRAE 62, provided the resulting outdoor air quantities are no less than required by the Standards. Table 4-12 shows the typical maximum occupant loads for various building uses (upon which minimum ventilation calculations are based). This provides dilution for the occupant-borne contaminants (or bioeffluents) like body odor and germs. Table 4-13 summarizes the combination of these two rates for typical spaces. As previously stated, each space-conditioning system must provide outdoor ventilation air as follows. 1. For a space-conditioning system serving a single space, the required system outdoor airflow is equal to the design outdoor ventilation rate of the space. 2. For a space-con l

hat each space actually receive its calculated outdoor air quantity (§120.1(b)2 Exception). Instead, the actual supply to any given space may be any combination of recirculated air, outdoor air, or air transferred directly from other spaces, provided: a. The total amount of outdoor air delivered by the space-conditioning system(s) to all spaces is at least as large as the sum of the space design quantities b. Each space always receives a supply airflow, including recirculated air and/or transfer air, no less than the calculated outdoor ventilation rate
c. When using transfer air, none of the spaces from which air is transferred has any unusual sources of contaminants

4.3.5 Ventilation System Operation and Controls §120.1(c)
C. Demand Controlled Ventilation System NA7.5.5
Demand controlled ventilation systems are checked for compliance with sensor location, calibration (either factory certificate or field validation) and tested for system response with both a high signal (produced by a certified calibration test gas applied to the sensor) and low signal (by increasing the setpoint above the ambient level). A certificate of acceptance must be provided to the enforcement agency that the demand control ventilation system meets the Acceptance Requirements for Code Compliance. The certificate of acceptance must include certification from the manufacturers of sensor devices that they will meet the requirements of §120.1(c)4F and that they will provide a signal that indicates the CO2 level in the range required by §120.1(c)4, certification from the controls manufacturer that they respond to the type of signal that the installed sensors supply and that they can be calibrated to the CO2 levels specified in §120.1(c)4, and that the CO2 sensors have an accuracy of within plus or minus 75 ppm at 600 and 1,000 ppm concentrations, and require calibration no more frequently than once every 5 years.

G. Occupant Sensor Ventilation Coil and Setback: §120.2(e)3 and 120.1(c)5
Multipurpose room less than 1,000 ft2, classrooms greater than 750 ft2, conference, convention, auditorium and meeting center rooms greater than 750 ft2 that do not have processes or operations that generate dusts, fumes, vapors or gasses shall be equipped with occupant sensor(s) to accomplish the following when occupants are not present: 1. Slightly widen the thermal deadband: automatically setup the operating cooling temperature set point by 2°F or more and setback the operating heating temperature set point by 2°F or more; and 2. Automatically reset the minimum required ventilation rate with an occupant sensor ventilation control device according to § 120.1(c)5: Occupant Sensor Ventilation Control Devices. This scenario requires an additional control sequence for built-up VAV systems or a thermostat that can accept an occupancy sensor input and has three scheduling modes (occupied, standby, and unoccupied) for packaged equipment. A thermostat with three scheduling modes works as follows. The unoccupied period is scheduled as usual for the normal unoccupied period, e.g. nighttime. The occupied period is scheduled as usual for the normal occupied period, e.g. daytime. When the morning warm-up occurs, the thermostat's occupied schedule is used to establish the heating/cooling temperature setpoints. Upon completion of the morning warm-up, the standby setpoint schedule on the thermostat is enabled. This schedule remains in effect until occupancy is sensed (then enabling the occupied setpoint schedule) or until the normally scheduled unoccupied period occurs. After the period of occupancy ends, e.g. a conference room is vacated, and when the time delay expires as programmed into the occupancy sensor, the standby setpoint schedule on the thermostat is enabled. The following chart shows an example of how the three scheduling modes might be programmed for a cooling setup of 4oF and a heating setback of 4oF.

H. Hotel/Motel Guest Room Controls: §120.2(e)4
Hotel and motel guest rooms shall have captive card key controls, occupancy sensing controls, or automatic controls such that, no longer than 30 minutes after the guest room has been vacated, setpoints are setup at least +5°F (+3°C) in cooling mode and set-down at least -5°F (-3°C) in heating mode.

J. Infiltration Control §120.2(f)
Outdoor air supply and exhaust equipment must incorporate dampers that automatically close when fans shut down. The dampers may either be motorized, or of the gravity type. Damper control is not required where it can be demonstrated to the satisfaction of the enforcement agency that the space-conditioning system must operate continuously §120.2(f) Exception No. 1. Nor is damper control required on gravity ventilators or other non-electrical equipment, provided that readily accessible manual controls are incorporated §120.2(f) Exception No. 2. Damper control is also not required at combustion air intakes and shaft vents, or where prohibited by other provisions of law §120.2(f) Exceptions No. 3 and 4. If the designer elects to install dampers or shaft vents to help control stack-induced infiltration, the damper should be motorized and controlled to open in a fire in accordance with applicable fire codes.

P. Economizer Fault Detection and Diagnostics §120.2(i)
Economizer Fault Detection and Diagnostics (FDD) is a mandatory requirement for all newly installed air-cooled unitary direct-expansion units, with mechanical cooling capacity at AHRI conditions of greater than or equal to 54,000 Btu/hr, and equipped with an economizer. Where required, the FDD system shall meet the requirements of 120.2(i)2 through 120.2(i)9, as described below. Air-cooled unitary direct expansion units include packaged, split-systems, heat pumps, and variable refrigerant flow (VRF), where the VRF capacity is defined by that of the condensing unit. 1. The following temperature sensors shall be permanently installed to monitor system operation: outside air, supply air, and return air; and 2. Temperature sensors shall have an accuracy of ±2°F over the range of 40°F to 80°F; and 3. Refrigerant pressure sensors, if used, shall have an accuracy of ±3 percent of full scale; and 4. The controller shall have the capability of displaying the value of each sensor; and 5. The controller shall provide system status by indicating the following conditions: a. Free cooling available b. Economizer enabled c. Compressor enabled d. Heating enabled e. Mixed air low limit cycle active 6. The unit controller shall manually initiate each operating mode so that the operation of compressors, economizers, fans, and heating system can be independently tested and verified; and 7. Faults shall be reported to a fault management application accessible by day-to-day operating or service personnel, or annunciated locally on zone thermostats; and 8. The FDD system shall detect the following faults: a. Air temperature sensor failure/fault. This failure mode is a malfunctioning air temperature sensor, such as the outside air, discharge air, or return air temperature sensor. This could include mis-calibration, complete failure either through damage to the sensor or its wiring, or failure due to disconnected wiring. b. Not economizing when it should. In this case, the economizer should be enabled, but for some reason it's not providing free cooling. This leads to an unnecessary increase in mechanical cooling energy. Two examples are the economizer high limit setpoint is too low, say 55°F, or the economizer is stuck closed. c. Economizing when it should not. This is opposite to the previous case of not economizing when it should. In this case, conditions are such that the economizer should be at minimum ventilation position but for some reason it is open beyond the correct position. This leads to an unnecessary increase in heating and cooling energy. Two examples are the economizer high limit setpoint is too high, say 82°F, or the economizer is stuck open. d. Damper not modulating. This issue represents a stuck, disconnected, or otherwise inoperable damper that does not modulate open and closed. It is a combination of the previous two faults: not economizing when it should, and economizing when it should not. e. Excess outdoor air. This failure mode is the economizer provides an excessive level of ventilation, usually much higher than is needed for design minimum ventilation. It causes an energy penalty during periods when the economizer should not be enabled, that is, during heating mode, excess outdoor air will increase heating energy. 9. The FDD system shall be certified to the Energy Commission as meeting these requirements 120.2(i)1 through 120.2(i)8 in accordance with Section 100(h): Certification Requirements for Manufactured Equipment, Products, and Devices. That is, the FDD system shall be certified by the manufacturer in a declaration, executed under penalty of perjury under the laws of the State of California, that all the information provided pursuant to the certification is true, complete, accurate and in compliance with all applicable provisions of Part 6.

C. Requirements for Air Distribution System Ducts and Plenums §120.4
Poorly sealed or poorly insulated duct work can cause substantial losses of air volume and energy. All air distribution system ducts and plenums, including building cavities, mechanical closets, air handler boxes and support platforms used as ducts or plenums, are required to be installed, sealed, and insulated in accordance with the California Mechanical Code (CMC) Sections 601, 602, 603, 604, 605 and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition.

MECHANICAL GENERAL NOTES

CONTRACTOR SHALL PROVIDE A PROGRAMABLE THERMOSTAT WITH A 7-DAY TIMECLOCK AND A 4-HOUR BYPASS TIMER FOR EACH TENANT SPACE.

THE REQUIRED ROUTINE MAINTENANCE FOR ALL MECHANICAL EQUIPMENT UNDER THIS SPECIFICATION SHALL BE CLEARLY STATED AND AFFIXED TO THE EQUIPMENT IN A READILY ACCESSIBLE LOCATION.

THERMOSTAT SHALL BE PROVIDED WITH AN AUTOMATIC CHANGEOVER FEATURE. (LOCATED 36"- 48" ABOVE FINISHED FLOOR)

CONTRACTOR SHALL COORDINATE ELECTRICAL SERVICE OUTLET LOCATIONS TO WITHIN 25 FT. OF ALL MECHANICAL UNITS.

ALL WIRING SHALL CONFORM TO LOCAL CODES.

THE INSTALLATION OF ALL MECHANICAL EQUIPMENT SHALL COMPLY WITH ALL STATE, LOCAL, FIRE AND HEALTH CODES AND/OR REGULATIONS.

ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

CONTRACTOR SHALL COORDINATE ALL EQUIPMENT INSTALLATION REQUIREMENTS WITH GENERAL CONTRACTOR PRIOR TO BIDDING THIS WORK.

THE EXACT LOCATION OF ALL MECHANICAL EQUIPMENT SHALL BE VERIFIED WITH THE ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO COMMENCEMENT OF WORK.

ALL DUCT JOINTS EXPOSED TO WEATHER SHALL BE SEALED WATERTIGHT WITH GLENCOAT.

DUCTWORK SHALL BE CONSTRUCTED OF GALVINIZED SHEET METAL OR ALUM-N-FLEX.

PERMITS AND INSPECTIONS SHALL BE OBTAINED BY THE CONTRACTOR.

CONTRACTOR SHALL COORDINATE WIRING, FUSED DISCONNECT SWITHES AND CONDUIT REQUIREMENTS WITH ELECTRICAL CONTRACTOR.

CONTRACTOR SHALL COORDINATE ALL GAS AND INDIRECT WASTE REQUIREMENTS WITH PLUMBING CONTRACTOR PRIOR TO COMMENCEMENT OF WORK.

PENETRATIONS OF FIRE-RESISTIVE WALLS, FLOOR-CEILINGS AND ROOF-CEILINGS SHALL BE PROTECTED AS REQUIRED IN UBC SECITONS 709 AND 710.
PROVIDE ACCESS DOOR WITH A LABEL READING (FIRE OR FIRE/SMOKE DAMPER.)

VENTILATION EQUIPMENT SHALL BE CAPABLE OF PROVIDING A MINIMUM OF 4 AIR CHANGES PER HOUR IN TOILET ROOMS AND 2 AIR CHANGES PER HOUR IN ALL OTHER ROOMS.

REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF ALL CEILING DIFFUSERS, REGISTERS AND GRILLES.

ALL LABOR AND MATERIALS SHALL BE GAURANTEED FOR A PERIOD OF ONE YEAR.

SOUND LINE (SL) ALL SUPPLY AND RETURN AIR DUCTS EXPOSED TO WEATHER UNLESS NOTED OTHERWISE, USE ACOUSTIC LINER UNDER 1-1/2" THICK WITH A MINIMUM R=6 VALUE EXCLUSIVE OF FILM RESISTANCE - "NBFU" RATED.
ALL DUCT DIMENSIONS ARE INSIDE NET SIZES UNLESS NOTED OTHERWISE.

ALL SHEET METAL CONSTRUCTION AND GAUGES SHALL BE IN ACCORDANCE WITH STATE AND LOCAL CODES, SMACNA AND ASHRAE RECOMMENDATIONS. TAPE ALL LONGITUDINAL JOINTS.

PAINT INSIDE OF DUCT FLAT BLACK WHERE VISIBLE THRU AIR OUTLETS. (VISIBLE LINER SHALL HAVE BLACK FACING)

SERVICE TELEPHONE NUMBERS SHALL BE MOUNTED TO ALL MAJOR EQUIPMENT. ALL TOOLS FURNISHED WITH THE EQUIPMENT FOR MAINTENANCE AND OPERATION OF THE EQUIPMENT SHALL BE DELIVERED TO THE OWNER UPON COMPLETION OF WORK.

OUTDOOR AIR SUPPLY AND EXHAUST EQUIPMENT SHALL BE INSTALLED WITH DAMPERS THAT AUTOMATICALLY CLOSE UPON FAN SHUTDOWN

THE ENTIRE INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE LATEST CALIFORNIA CODES, AND ALL OTHER APPLICABLE CODES AND REGULATIONS, INCLUDING CALIFORNIA ENERGY CONSERVATION STANDARDS DIVISION T-20, CALIFORNIA AMENDMENTS AND CITY ORDINANCES. CONSTRUCTION CODE DATA: 2013 CALIFORNIA MODEL CODES AS BASED ON THE 2012 IBC, 2012 UMC & UPC, 2011 NEC, 2012 IFC AND THE 2008 CALIFORNIA ENERGY CODE

COORDINATE ENTIRE INSTALLATION OF THE HVAC SYSTEM WITH THE WORK OF ALL OTHER TRADES PRIOR TO ANY FABRICATION OR INSTALLATION. PROVIDE ALL FITTINGS, OFFSETS AND TRANSITIONS AS REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.

MAINTENANCE LABEL SHALL BE AFFIXED TO ALL MECHANICAL EQUIPMENT AND A MAINTENANCE MANUAL SHALL BE PROVIDED FOR THE OWNERS USE.

ALL LINE AND LOW VOLTAGE WIRING SHALL BE INSTALLED IN CONDUIT. ALL CONDUIT & LINE VOLTAGE SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS INDICATED ON THE ELECTRICAL DRAWINGS OR AS SPECIFIED IN THE ELECTRICAL SECTION OF THE SPECIFICATIONS. ALL ELECTRICAL WORK SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE CODES AND REGULATIONS OF GOVERNING BODIES HAVING JURISDICTION THEREOF.

(E) INDICATES ITEMS FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS SHOWN ON THE ELECTRICAL DRAWINGS OR SPECIFIED IN THE ELECTRICAL SECTION OF THE SPECIFICATIONS.

(M) INDICATES ITEMS FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR AS SHOWN ON THE MECHANICAL DRAWINGS OR SPECIFIED IN THE MECHANICAL SECTION OF THE SPECIFICATIONS.

(ME) INDICATES ITEMS FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

ALL DUCTWORK SHALL BE CONSTRUCTED, ERECTED AND TESTED IN ACCORDANCE WITH THE MOST RESTRICTIVE OF LOCAL REGULATIONS, PROCEDURES DETAILED IN THE ASHRAE HANDBOOK OF FUNDAMENTALS, THE APPLICABLE STANDARDS ADOPTED BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION,AND CHAPTER 10 OF STATE MECHANICAL CODE (T24-#4).

SUPPLY DUCT SMOKE DETECTOR MUST BE PROVIDED FOR ALL SYSTEM(S) TOTALING OVER 2000 CFM, POTTORFF SYSTEM SENSOR #DH400ACDCP, 12V/60/1PH.
FOR OUTDOORS INSTALLATION USE DH400ACDCIHT IN NEMA 4 ENCLOSURE.

MANUAL VOLUME DAMPERS SHALL BE PROVIDED IN ALL DUCT BRANCHES TO INDIVIDUAL DIFFUSERS, GRILLES AND REGISTERS.

ALL EQUIPMENT, DUCTS, PIPING AND OTHER DEVICES AND MATERIALS INSTALLED OUTSIDE OF THE BUILDING OR OTHERWISE EXPOSED TO THE WEATHER SHALL BE COMPLETELY WEATHER-PROOFED.

ALL HVAC EQUIPMENT SHALL BE CERTIFIED BY THE CALIFORNIA ENERGY COMMISION TO COMPLY WITH THE LATEST EFFICIENCY STANDARDS PER TITLE 24. CURRENTLY 2005

OUTSIDE AIR INTAKES SHALL BE A MINIMUM OF (10) TEN FEET FROM SEWER VENTS, 3' FROM ENVIRONMENTAL EXHAUST, COVER INTAKES WITH 1/4" MESH GALVINIZED SCREEN.

MAKE CONNECTION TO CEILING DIFFUSERS WITH INSULATED "GLASSFLEX" LOW PRESSURE FLEXIBLE DUCT S-181.

FLEXIBLE DUCTS SHALL BE FACTORY FABRICATED INSULATED LOW PRESSURE DUCT WITH THE FOLLOWING CHARACTERISTICS:
A. ZINC COATED SPRING STEEL HELIX WITH (1) ONE INCH THICK FIBERGLASS INSULATION, SHEATHED IN A SEAMLESS VAPOR BARRIER JACKET.
B. INTERIOR FIRE RESISTANT COATED TO PREVENT FIBER ERROSION.
C. CLASS 1 WITH A FLAME SPREAD OF 25 OR LESS, SMOKE DEVELOPED OF 50 OR LESS AS DEFINED IN NFPA-90(A) AND BEARING A UL LABEL.

TOILET ROOM CEILING EXHAUST FANS SHALL BE CONTROLLED BY LIGHT SWITCH.
ALL OTHER EXHAUST FANS SHALL BE CONTROLLED BY BLDG. TIME CLOCK.
TOILET EXHAUST AIR CONNECTORS AND RUN-OUTS TO BE GALVANIZED OR ALUM-N-FLEX DUCTS.

THE HVAC CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO SUBMITTING HIS BID IN ORDER TO VERIFY ALL EXISTING FIELD CONDITIONS, THE HVAC DRAWINGS ARE ESSENTIALLY DIAGRAMATIC AND ANY OFFSETS DUE TO EXISTING CONDITIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

ALL DAMPERS TO BE ACCESSIBLE THROUGH FELT STRIPPED ACCESS PANEL IN DUCT AND SHALL BE THE FULL SIZE OF THE DUCT, CONSTRUCT WITH CHANNEL FRAME AND TAG FOR EASY IDENTIFICATION AFTER INSTALLATION.

HVAC UNITS SHALL BE FURNISHED WITH A (4) FOUR YEAR EXTENDED WARRANTY ON ALL COMPRESSORS.

IF DURING THE FIRST YEAR AFTER ACCEPTANCE BY THE OWNER, ANY MATERIALS OR APPARATUS PROVE TO BE DEFECTIVE OR IF ANY PART OF THE HVAC SYSTEM FAILS TO FUNCTION PROPERLY, THE CONTRACTOR SHALL CORRECT THE DEFECTS WITHOUT ANY EXPENSE TO THE OWNER. IF A PROBLEM EXISTS AND IT IS A CONTINUAL PROBLEM, IT SHALL BE CORRECTED AND A GUARANTEE SHALL COMMENCE WHEN COMPLETED.

ALL MECHANICAL EQUIPMENT AND ACCESSORIES SHALL BE BRACED OR ANCHORED TO RESIST A HORIZONTAL FORCE OF 20% OF ITS UPPER RATING WEIGHT ACTING IN ANY DIRECTION.

WHEN SUPPLYING AIR TO RATED CORRIDOR, THE SAME AMOUNT OF AIR MAY BE RETURNED TO THE EQUIPMENT ONLY IF SUPPLIED W/ DEDICATED AC UNIT AND PROVIDED WITH SMOKE DETECTOR FOR FAN SHUT DOWN. (SEC. 404.1.8) OTHERWISE NO RETURN IS ALLOWED.

MAKE UP AIR FOR BATHROOMS OR ANY OTHER ROOMS WITH MEANS OF EXHAUST CAN NOT BE OBTAINED FROM A RATED CORRIDOR, NOR SPACES ABOVE SHALL BE USED TO CONVEY AIR TO OR FROM ROOMS.

REFRIGERANT PIPING SHALL BE TYPE "K" COPPER, INSULATE SUCTION LINE PER TABLE 4-9.

PLUMBING CONTRACTOR SHALL COMPLETE PRIMARY CONDENSATE DRAIN LINES. SECONDARY LINES SHALL BE BY MECHANICAL CONTRACTOR.

WHEN MORE THAN ONE HVAC UNIT IS INSTALLED IN A BUILDING, EACH UNIT SHALL BE PERMANENTLY LABELED TO SHOW NUMBER AND AREA OR SPACE SERVED BY THE UNIT.

LOW VOLTAGE WIRING THAT IS EXPOSED TO WEATHER SHALL BE INSTALLED IN A MANNER TO PREVENT ANY PHYSICAL DAMAGE.

AIR CONDITIONING LEGEND

SYMBOL	DESIGNATION	SYMBOL	DESIGNATION
⧓	DUCT RISER OR DROP (SUPPLY AIR)	C.D.	CEILING DIFFUSER
◣	DUCT RISER OR DROP (RETURN AIR)	C.R.	CEILING RETURN
⊠	DUCT RISER OR DROP (EXHAUST AIR)	C.E.	CEILING EXHAUST
DL	DOOR LOUVERS	S.W.S.	SIDE WALL SUPPLY
UC	UNDERCUT DOOR	S.W.R	SIDE WALL RETURN
(SL)	SOUND LINE	S.W.E.	SIDE WALL EXHAUST
S.A.	SUPPLY AIR	M.V.D.	MANUAL VOLUME DAMPER
R.A.	RETURN AIR	V.T.R.	VENT THROUGH ROOF
E.A.	EXHAUST AIR	T	ROOM THERMOSTAT
OSA	OUTSIDE AIR	A.P.	ACCESS PANEL
M.A.	MIXED AIR	A.D.	ACCESS DOOR
BT	BY-PASS TIMER	P.O.C.	POINT OF CONNECTION
U.T.R.	UP THROUGH ROOF	(N)	NEW
(E)	EXISTING	SD	AREA SMOKE DETECTOR,POTTORFF SYSTEM SENSOR 2451, 120V/60/1PH.
C.B.	CIRCUIT BREAKER	F.S.D.	AUTOMATIC FIRE / SMOKE DAMPER
F.D.S.	FUSED DESCONNECT SWITCH	S	SWITCH
SC	SPEED CONTROLLER	LBR	LINEAR BAR REGISTER
R	RELOCATED WORK	R	EX. WORK TO REMOVE OR RELOCATE
N	NEW WORK		EXISTING WORK TO REMAIN
	CAP AIR TIGHT		FIRE SMOKE DAMPER BY POTTORFF FSD172/FSD142, 120V/1ø, 30W, 64VA SOLENOID MOTOR ONLY, NO STALL MOTOR ALLOWED, CLASS 2 METAL TO METAL SEALS, NO SILICON SEALS ALLOWED, CSFM 3225-368-110 AND 3230-368-111 TYP.
DD	DUCT S.DETECTOR, POTTORFF SYS. SENSOR 2151 OR DH100ACDCP, 120V/60/1PH.		
BDD	BACKDRAFT DAMPER		
CO	CO SENSOR SET @ 800 PPM	BS	BIRD SCREEN

SHEET INDEX

REVISIONS
DATE

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PROJECT NO:	120102
CAD DWG FILE:	
DRAWN BY :	M.M.
CHECKED BY:	G.B.
SCALE:	NOTED
DATE :	04-08-12

SHEET TITLE:
NOTES
EQUIP.
LEGEND

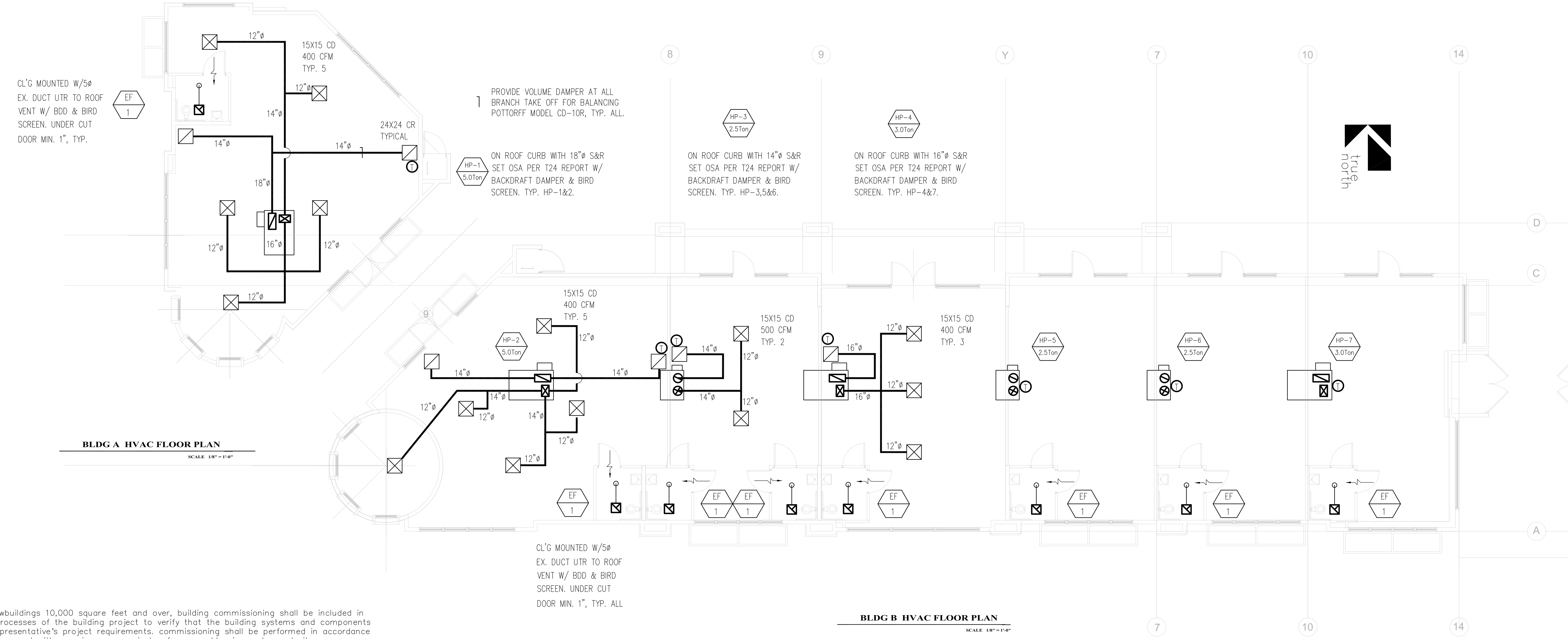
SHEET
M-1
1 OF 7

CONSTRUCTION NOTES:

1. FRESH AIR INTAKES SHALL BE 10'-0" MIN. AWAY FROM ALL EXHAUST OUTLETS, PLUMBING VENTS, AND FLUES.
2. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS WITHIN 45 DAYS OF AWARD OF CONTRACT. SEE SPECIFICATIONS FOR REQUIREMENTS. IF SHOP DRAWINGS ARE NOT PROVIDED TO THE ENGINEER FOR APPROVAL, AND ANY CONFLICTS OCCUR BETWEEN TRADES, DURING CONSTRUCTION, & ETC. THEN, THE CONTRACTOR SHALL BE RESPONSIBLE AND BEAR ALL COST INCURRED FOR ANY REVISIONS, AT NO ADDITIONAL COST TO THE DISTRICT. THE DISTRICT AND ENGINEER SHALL BE NOTIFIED IMMEDIATELY PRIOR TO FABRICATION AND INSTALLATION OF ANY CONFLICTS BETWEEN TRADES, DURING CONSTRUCTION, & ETC.
3. VERIFY PAINT COLOR OF ALL EXPOSED DUCTWORK AND AIR DISTRIBUTION EQUIPMENT WITH ARCHITECT.

GENERAL NOTES

1. CONTRACTOR SHALL IDENTIFY ALL HVAC EQUIPMENT WITH STORE NAME AND UNIT NUMBER USING PERMANENT, WEATHER PROOF 2" HIGH DIE-CUT LETTERS.
2. ANY PENETRATION THROUGH THE ROOF SHALL BE COORDINATED WITH THE LANDLORD'S FIELD REPRESENTATIVE AND SHALL BE DONE BY A LANDLORD APPROVED ROOFING CONTRACTOR IN ORDER TO MAINTAIN THE ROOFING WARRANTEE. ALL VENTS SHALL EXTEND A MINIMUM OF 12 INCHES ABOVE ROOF AND SHALL BE A MINIMUM OF 10 FEET FROM ANY OUTSIDE AIR INTAKE.
3. ALL DUCT SIZES SHOWN ARE CLEAR INSIDE AIR FLOW DIMENSIONS.
4. AIR EXTRACTORS OR SPLITTER DAMPERS SHALL NOT PROTRUDE INTO RECTANGULAR TRUNK DUCTS . PROVIDE ROUND SPIN-IN FITTINGS FOR ROUND BRANCH DUCTS.
5. ROUND BRANCH DUCTS WHERE INDICATED ARE SAME SIZE AS ATTACHED DIFFUSER NECK SIZE.
6. DO NOT SUSPEND ANY ITEMS FROM DECK OR SLAB ABOVE. ALL ITEMS SHALL SUSPENDED FROM STRUCTURE UNLESS OTHERWISE NOTED. PROVIDE MISCELLANEOUS STEEL AS REQUIRED.
7. WHERE CEILING SPACE IS NOT SUFFICIENT TO PERMIT TOP CONNECTION TO CEILING DIFFUSER WITH PROPER BEND RADIUS FOR FLEXIBLE DUCT, CONTRACTOR SHALL FABRICATE AND/OR PROVIDE AN ADAPTER BOX FOR DIFFUSER TO PERMIT SIDE CONNECTION OF FLEXIBLE DUCT.
8. CONTRACTOR SHALL COORDINATE AND SCHEDULE ALL WORK WITH LANDLORD'S FIELD REPRESENTATIVE.
9. PROVIDE SUPPORT FOR PIPING ON ROOF PER LANDLORDS ROOFING CONTRACTORS RECOMMENDATIONS.
10. PROVIDE MANUAL DAMPER, FOR AIR BALANCE, AT ALL BRANCH TAKE-OFFS. DAMPER TO BE THE SAME SIZE AS THE BRANCH TAKE-OFF.



15X15 CD
400 CFM
TYP. 5
12"ø
14"ø
16"ø
18"ø
24X24 CR
TYPICAL
CL'G MOUNTED W/5ø
EX. DUCT UTR TO ROOF
VENT W/ BDD & BIRD
SCREEN. UNDER CUT
DOOR MIN. 1", TYP.
EF
1
PROVIDE VOLUME DAMPER AT ALL
BRANCH TAKE OFF FOR BALANCING
POTTORFF MODEL CD-10R, TYP. ALL.
HP-1
5.0Ton
ON ROOF CURB WITH 18"ø S&R
SET OSA PER T24 REPORT W/
BACKDRAFT DAMPER & BIRD
SCREEN. TYP. HP-1&2.
HP-3
2.5Ton
ON ROOF CURB WITH 14"ø S&R
SET OSA PER T24 REPORT W/
BACKDRAFT DAMPER & BIRD
SCREEN. TYP. HP-3,5&6.
HP-4
3.0Ton
ON ROOF CURB WITH 16"ø S&R
SET OSA PER T24 REPORT W/
BACKDRAFT DAMPER & BIRD
SCREEN. TYP. HP-4&7.
true
north
HP-2
5.0Ton
15X15 CD
500 CFM
TYP. 2
15X15 CD
400 CFM
TYP. 3
HP-5
2.5Ton
HP-6
2.5Ton
HP-7
3.0Ton
8
9
Y
7
10
14
D
C
A
BLDG A HVAC FLOOR PLAN
SCALE 1/8" = 1'-0"
CL'G MOUNTED W/5ø
EX. DUCT UTR TO ROOF
VENT W/ BDD & BIRD
SCREEN. UNDER CUT
DOOR MIN. 1", TYP. ALL
BLDG B HVAC FLOOR PLAN
SCALE 1/8" = 1'-0"

5.410.2 commissioning. for newbuildings 10,000 square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements. commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity.

5.410.2.1 Owner's or Owner representative's Project Requirements (OPR). The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins.

5.410.2.2 Basis of Design (BOD). A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project, and updated as necessary during the design and construction phases. The Basis of Design document shall cover the following systems: 1. Heating, ventilation, air conditioning (HVAC) systems and controls 2. Indoor lighting system and controls 3. Water heating system

5.410.2.3 Commissioning plan. Prior to permit issuance a commissioning plan shall be completed to document how the project will be commissioned and shall be started during the design phase of the building project. The Commissioning Plan shall include the following: 1. General project information 2. Commissioning goals 3. Systems to be commissioned. Plans to test systems and components shall include: a. An explanation of the original design intent b. Equipment and systems to be tested, including the extent of tests c. Functions to be tested d. Conditions under which the test shall be performed e. Measurable criteria for acceptable performance 4. Commissioning team information 5. Commissioning process activities, schedules and responsiblities. Plans for the completion of commissioning requirements listed in Sections 5.410.2.4 through 5.410.2.6 shall be included

5.410.2.4 Functional performance testing. Functional performance tests shall demonstrate the correct installation and operation of each component, system and systemto- system interface in accordance with the approved plans and specifications. Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made.

5.410.2.5.1 Systems manual. Documentation of the operational aspects of the building shall be completed within the Systems Manual and delivered to the building owner or representative and facilities operator. The Systems Manual shall include the following: 1. Site information, including facility description, history and current requirements 2. Site contact information 3. Basic operations and maintenance, including general site operating procedures, basic troubleshooting, recommended maintenance requirements, site events log 4. Major systems 5. Site equipment inventory and maintenance notes

5.410.2.5.2 Systems operations training. The training of the appropriate maintenance staff for each equipment type and/or system shall be documented in the commissioning report and shall include the following: 1. System/equipment overview (what it is, what it does and with what other systems and/or equipment it interfaces) 2. Review and demonstration of servicing/preventive maintenance 3. Review of the information in the Systems Manual 4. Review of the record drawings on the system/ equipment

5.410.2.6 Commissioning report. A complete report of commissioning process activities undertaken through the design, construction and reporting recommendations for postconstruction phases of the building project shall be completed and provided to the owner or representative.

5.410.4 Testing and adjusting. Testing and adjusting of systems shall be required for buildings less than 10,000 square feet.

5.410.4.2 Systems. Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting shall include at a minimum, as applicable to the project: 1. HVAC systems and controls 2. Indoor and outdoor lighting and controls 3. Water heating systems 4. Renewable energy systems 5. Landscape irrigation systems 6. Water reuse systems

5.410.4.3 Procedures. Perform testing and adjusting procedures in accordance with industry best practices and applicable standards on each system as determined by the building official.

5.410.4.3.1 HVAC balancing. In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, the system shall be balanced in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; or Associated Air Balance Council National Standards or as approved by the building official.

5.410.4.4 Reporting. After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.

5.410.4.5 Operation and maintenance (O &M) manual. Provide the building owner or representative with detailed operating and maintenance instructions and copies of guaranties/ warranties for each system. O &Minstructions shall be consistent with OSHA requirements in CCR, Title 8, Section 5142, and other related regulations.

5.410.4.5.1 Inspections and reports. Include a copy of all inspection verifications and reports required by the enforcing agency.

5.504.3 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation, or during storage on the construction site and until final startup of the heating and cooling equipment, all duct and other related air distribution component openings 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.

5.507.4.2 Interior sound. Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40. Note: Examples of assemblies and their various STC ratings may be found in the catalog of STC and ICC Ratings for Wall and Floor/Ceiling Assemblies.

5.508.1 Ozone depletion and greenhouse gas reductions. Installations of HVAC, refrigeration and fire suppression equipment shall comply with Sections 5.508.1.1 and 5.508.1.2.

5.508.1.1 Chlorofluorocarbons (CFCs). Install HVAC, refrigeration and fire suppression equipment that do not contain CFCs.

5.508.1.2 Halons. Install HVAC, refrigeration and fire suppression equipment that do not contain Halons.

REVISIONS
DATE

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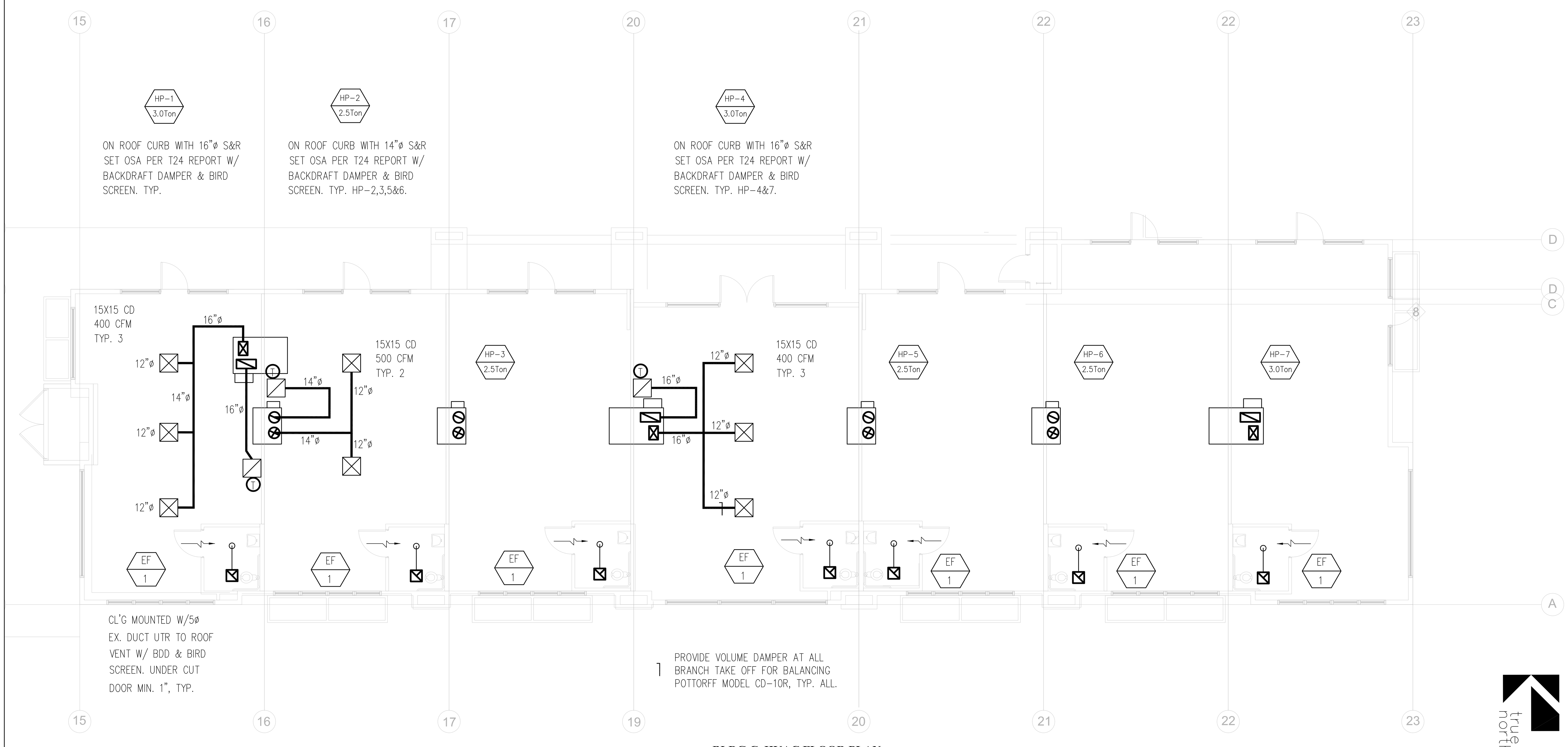
SHEET TITLE:

BLDG.
A & B
HVAC

SHEET
M-2.1
2 OF 7

WITHIN 90 DAYS AFTER THE ENFORCEMENT AGENCY ISSUES A FINAL OCCUPANCY PERMIT, RECORD DRAWINGS BE PROVIDEDTO THE BUILDING OWNER. IF ANY CHARACTERISTIC IS MATERIALLY CHANGED BEFORE FINAL CONSTRUCTION AND INSTALLATION, SUCH THAT THE BUILDING MAY NO LONGER COMPLY WITH PART 6, THE BUILDING MUST BE BROUGHT BACK INTO COMPLIANCE. AND SO INDICATED ON AMENDED PLANS, SPECIFICATIONS, AND CERTIFICATE(S) OF COMPLIANCE AND SHALL BE SUBMITTEDTO THE ENFORCEMENT AGENCY
FENESTRATION PRODUCTS SHALL:
A. HAVE A TEMPORARY LABEL (OR LABEL CERTIFICATE FOR SITE-BUILT FENESTRATION) MEETING THE REQUIREMENTS OF SECTION 10-111(A)1, NOT TO BE REMOVED BEFORE INSPECTION BY THE ENFORCEMENT AGENCY, LISTING THE CERTIFIED U-FACTOR AND SHGC, AND CERTIFYING THAT THE AIR LEAKAGE REQUIREMENTS OF SECTION 116(A)1 ARE MET FOR EACH PRODUCT LINE; AND
B. HAVE A PERMANENT LABEL (OR LABEL CERTIFICATE FOR SITE-BUILT FENESTRATION) MEETING THE REQUIREMENTS OF SECTION 10-111(A)2 IF THE PRODUCT IS RATED USING NFRC PROCEDURES.
FIELD-FABRICATED FENESTRATION AND FIELD-FABRICATED EXTERIOR DOORS SHALL BE CAULKED BETWEEN THE FENESTRATION PRODUCTS OR EXTERIOR DOOR AND THE BUILDING, AND SHALL BE WEATHERSTRIPPED.
EXCEPTION TO SECTION 116(B): UNFRAMED GLASS DOORS AND FIRE DOORS NEED NOT BE WEATHERSTRIPPED OR CAULKED.
HEAT PUMPS WITH SUPPLEMENTARY ELECTRIC RESISTANCE HEATERS SHALL HAVE CONTROLS: 1. THAT PREVENT SUPPLEMENTARY HEATER OPERATION WHEN THE HEATING LOAD CAN BE MET BY THE HEAT PUMP ALONE; AND 2. IN WHICH THE CUT-ON TEMPERATURE FOR COMPRESSION HEATING IS HIGHER THAN THE CUT-ON TEMPERATURE FOR SUPPLEMENTARY HEATING, AND THE CUT-OFF TEMPERATURE FOR COMPRESSION HEATING IS HIGHER THAN THE CUT-OFF TEMPERATURE FOR SUPPLEMENTARY HEATING.
ALL INSULATING MATERIAL SHALL BE INSTALLED IN COMPLIANCE WITH THE FLAMESPREAD RATING AND SMOKE DENSITY REQUIREMENTS OF THE CBC.
THE OPAQUE PORTIONS OF FRAMED DEMISING WALLS IN NONRESIDENTIAL BUILDINGS SHALL BE INSULATED WITH AN INSTALLED R-VALUE OF NO LESS THAN R-13 BETWEEN FRAMING MEMBERS.
ROOFING PRODUCT'S THERMAL EMITTANCE AND 3-YEAR AGED SOLAR REFLECTANCE SHALL BE CERTIFIED AND LABELED ACCORDING TO THE REQUIREMENTS OF SECTION 10-113 BY THE COOL ROOF RATING COUNCIL (CRRC) & MEET CONDITIONS IN SEC 118(i)
ALL AIR DISTRIBUTION SYSTEM DUCTS AND PLENUMS, INCLUDING, BUT NOT LIMITED TO, BUILDING CAVITIES, MECHANICAL CLOSETS, AIR-HANDLER BOXES AND SUPPORT PLATFORMS USED AS DUCTS OR PLENUMS, SHALL BE INSTALLED, SEALED AND INSULATED TO MEET THE REQUIREMENTS OF THE 2007 CMC SECTIONS 601, 602, 603, 604, 605, AND STANDARD 6-5, INCORPORATED HEREIN BY REFERENCE. CONNECTIONS OF METAL DUCTS AND THE INNER CORE OF FLEXIBLE DUCTS SHALL BE MECHANICALLY FASTENED. OPENINGS SHALL BE SEALED WITH MASTIC, TAPE, AEROSOL SEALANT, OR OTHER DUCT-CLOSURE SYSTEM THAT MEETS THE APPLICABLE REQUIREMENTS OF UL 181, UL 181A, OR UL 181B. IF MASTIC OR TAPE IS USED TO SEAL OPENINGS GREATER THAN 1/4 INCH, THE COMBINATION OF MASTIC AND EITHER MESH OR TAPE SHALL BE USED. PORTIONS OF SUPPLY-AIR AND RETURN-AIR DUCTS CONVEYING HEATED OR COOLED AIR LOCATED IN ONE OR MORE OF THE FOLLOWING SPACES SHALL BE INSULATED TO A MINIMUM INSTALLED LEVEL OF R-8 :
ALL DUCT SYSTEMS SHALL BE SEALED TO A LEAKAGE RATE NOT TO EXCEED 6% OF THE FAN FLOW IF THE DUCT SYSTEM: 1. IS CONNECTED TO A CONSTANT VOLUME, SINGLE ZONE, AIR CONDITIONERS, HEAT PUMPS OR FURNACES, AND 2. SERVING LESS THAN 5,000 SQUARE FEET OF FLOOR AREA; AND 3. HAVING MORE THAN 25% DUCT SURFACE AREA LOCATED IN ONE OR MORE OF THE FOLLOWING SPACES: A. OUTDOORS, OR B. IN A SPACE DIRECTLY UNDER A ROOF WHERE THE U-FACTOR OF THE ROOF IS GREATER THAN THE U-FACTOR OF THE CEILING, OR EXCEPTION TO SECTION 144(K) 3 B: WHERE THE ROOF MEETS THE REQUIREMENTS OF 143(A)1C. C. IN A SPACE DIRECTLY UNDER A ROOF WITH FIXED VENTS OR OPENINGS TO THE OUTSIDE OR UNCONDITIONED SPACES, OR D. IN AN UNCONDITIONED CRAWLSPACE; OR E IN OTHER UNCONDITIONED SPACES. THE LEAKAGE RATE SHALL BE CONFIRMED THROUGH FIELD VERIFICATION AND DIAGNOSTIC TESTING, IN ACCORDANCE WITH PROCEDURES SET FORTH IN THE REFERENCE NONRESIDENTIAL



BLDG C HVAC FLOOR PLAN

SCALE 1/8" = 1'-0"

MECHANICAL ACCESSORIES

T-BAR CEILING SUPPLY (CD) ANEMOSTAT PME/PLD, TUTTLE & BAILEY APV TYPE3
T-BAR CEILING RETURN (CR) ANEMOSTAT 3PLD, TUTTLE & BAILEY APRL TYPE3,
TYPICAL FOR EXHAUST GRILLE (CE) AND TRANSFER GRILLE (TG).
HARD CEILING SUPPLY (CD) ANEMOSTAT RMD-S, TUTTLE & BAILEY AQD TYPE1-OBD.
HARD CEILING RETURN (CR) ANEMOSTAT S30VD, TUTTLE & BAILEY T60L,
TYPICAL FOR EXHAUST GRILL (CE) AND TRANSFER GRILL (TG).
SIDE WALL SUPPLY (SWS) ANEMOSTAT S20V-OBD, TUTTLE & BAILEY T60SD.
SIDE WALL RETURN (SWR) ANEMOSTAT X30HD-OB, TUTTLE & BAILEY T60L.

T-BAR CL'G. HORIZ. THROW SUPPLY SLOT, AIR MANAGERS # LTTB, T&B OR ANEMOSTAT.
T-BAR CL'G. DIRECT THROW SUPPLY SLOT, AIR MANAGERS # LTSC, T&B OR ANEMOSTAT.
FLOOR SUPPLY (FS) ANEMOSTAT TL15NR, TUTTLE & BAILEY 4401R-OBD W/
STRAIGHTENING VANES. PENCIL AND SHOE HEEL PROOF.
FLOOR RETURN (FR) ANEMOSTAT TL15NR, TUTTLE & BAILEY 4201R, W/
STRAIGHTENING VANES. PENCIL AND SHOE HEEL PROOF.

SUPPLY & RETURN RESPECTIVELY.
1"- OBD, ELIMINATE OBD FOR RETURN, FRAME TO MATCH CEILING TYPE.
MAX. 30 CFM/FT/SLOT SUPPLY & MAX. 50 CFM/FT/SLOT RETURN.
POSED ROUND SUPPLY DIFFUSER ANEMOSTAT C24 OR TUTTLE & BAILEY.
EXPOSED GYM. RETURN OR TRANSFER GRILL ANEMOSTAT SEHDD OR TUTTLE & BAILEY.
FIRE DAMPERS:
ALL WALL FIRE DAMPERS SHALL BE POTTORFF VFD-10D-ISB.
ALL CEILING FIRE DAMPERS SHALL BE POTTORFF CFD-15-ES OR CFD-20-ES.
SMOKE/FIRE DAMPERS:

ALL FS. DAMPERS SHALL BE POTTORFF FSD142 OR FSD172 W/SOLENOID MOTOR W/ HS10 HEAT SWITCH. NO STALL MOTORS. MIN. 5 YEAR WARRANTY, MAX. 10 CFM/SQ.FT CLASS II LEAKAGE MIN., W/ SILICONE SEALS, 120V/1PH. 64 VA. MOTOR ACTUATORS MUST BE BY ISO 9000 RECOGNIZED CONTROL MANUFACTURER AND CERTIFIED BY ETL LABORATORIES FOR 1 YEAR CONTINUOUS POWER APPLICATIONS SUCH AS BELIMO.
FURNISH ALL FIRE SMOKE DAMPERS WITH HS-10 FOR REMOTE ANNUNCIATION (WHEN FIRE LIFE SAFETY SYSTEM PANEL IS PRESENT, BY OTHERS).
VOLUME DAMPERS:
ALL MANUAL VOLUME DAMPERS SHALL BE POTTORFF, NO. CD10R.
BACKDRAFT DAMPERS:
ALL BACKDRAFT DAMPERS SHALL BE POTTORFF, NO. BD57A.
ACCESS DOORS:
ALL ACCESS DOORS SHALL BE POTTORFF, NO. 60-HAD.
CEILING AND ROOF EXHAUST FANS:
ALL CL'G. AND ROOF EXHAUST FANS SHALL BE BY CARNES OR EQUAL.
SOUND TRAPS:
ALL SOUND TRAPS SHALL BE DYNASONICS INC. OR EQUAL.
MUST HAVE THEIR OWN LABORATORY CERTIFIED BY NVLAP.
ALL PERFORMANCE DATA TESTED ACCORDING TO E-477-99

ALL ECONOMIZERS SHALL HAVE MANDATORY FAULT DETECTION DIAGNOSIS CONTROLS AND MODULATING COOLING CAPACITY. UNITS 6.25 TON AND GREATER SHALL HAVE VARIABLE AIR FLOW SUPPLY FANS. NEW PROJECTS MANDATORY REQUIREMENTS FOR AS BUILT COMMISSIONING.

ITEM	MFGR. & MODEL	CL'G	HT'G	CFM	ELEC.	MCA	MOCP	WT	REMARKS S/EER HSPF/COP	DIMENSIONS LxWxH
HP 2.5ton	CARRIER 50EZ-A30	28,800	29,000	1000	208-230/60/1 208-230/60/3	25 19	40 25	340	13.5/11.5 7.7/3.5 FACTORY CURB	44x37x51 HEIGHT= 37 +14"CURB
HP 3ton	CARRIER 50TCQA04 INTEGRATED ECONOMIZER	35,600	34,800	1200	208-230/60/1 208-230/60/3 460/60/3	33 25 12	50 30 15	505	13.4/11.0 7.7 ALT. FAN MOTOR FACTORY CURB CONV. OUTLET.	6'x4'x48 UNIT HT= 34 +14"CURB
HP 5ton	CARRIER 50TCQA06 INTEGRATED ECONOMIZER	58,000	55,000	2000	208-230/60/1 208-230/60/3 460/60/3	44 28 14	60 40 20	590	13.4/11.0 7.7 ALT. FAN MOTOR FACTORY CURB CONV. OUTLET.	6'x4'x48 UNIT HT= 34 +14"CURB
EF 1	ACME VQ-150	-	-	124 0.50"	120/60/1ø	1.3		23	CEILING MOUNTED W/ BACKDRAFT DAMPER, INTERLOCK WITH RM LIGHTS	12"X15"X10" W/GRILL

REVISIONS

DATE

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PROJECT NO: 120102
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CHECKED BY: G.B.
SCALE: NOTED
DATE : 04-08-12
SHEET TITLE:

BLDG.
C
HVAC

MECHANICAL VENTILATION AND REHEAT — MECH-3C

Project Name: *Rancho Shopping Center A* — Date: *3/10/2012*

	MECHANICAL VENTILATION (§121(b)2)								REHEAT LIMITATION (§144(d))				
	AREA BASIS			OCCUPANCY BASIS					VAV MINIMUM				
A	B	C	D	E	F	G	H	I	J	K	L	M	N
Zone/System	Condition Area (ft^2)	CFM per ft^2	Min CFM By Area B X C	Number Of People	CFM per Person	Min CFM by Occupant E X F	REQ'D V.A. Max of D or G	Design Ventilation Air CFM	50% of Design Zone Supply CFM	B X 0.4 CFM / ft^2	Max. of Columns H, J, K, 300 CFM	Design Minimum Air Setpoint	Transfer Air
Retail Zone	*1,228*	*0.25*	*307*				*307*	*307*					
Retail Mech. System						*Total*	*307*	*307*					
						Totals			Column I Total Design Ventilation Air				

C	Minimum ventilation rate per Section §121, Table 121-A.
E	Based on fixed seat or the greater of the expected number of occupants and 50% of the CBC occupant load for egress purposes for spaces without fixed seating.
H	Required Ventilation Air (REQ'D V.A.) is the larger of the ventilation rates calculated on an AREA BASIS or OCCUPANCY BASIS (Column D or G).
I	Must be greater than or equal to H, or use Transfer Air (column N) to make up the difference.
J	Design fan supply CFM (Fan CFM) x 50%; or the design zone outdoor airflow rate per §121.
K	Condition area (ft^2) x 0.4 CFM / ft^2; or
L	Maximum of Columns H, J, K, or 300 CFM
M	This must be less than or equal to Column L and greater than or equal to the sum of Columns H plus N.
N	Transfer Air must be provided where the Required Ventilation Air (Column H) is greater than the Design Minimum Air (Column M). Where required, transfer air must be greater than or equal to the difference between the Required Ventilation Air (Column H) and the Design Minimum Air (Column M), Column H minus M.

EnergyPro 5.1 by EnergySoft *User Number: 1126* ***RunCode: 2012-03-10T11:20:20*** *ID: 1203A* *Page 15 of 20*

CERTIFICATE OF COMPLIANCE and FIELD INSPECTION ENERGY CHECKLIST (Part 4 of 4) — MECH-1C

Project Name: *Rancho Shopping Center A* — Date: *3/10/2012*

TEST DESCRIPTION Equipment Requiring Testing	Qty.	MECH-12A Fault Detection & Diagnostics for DX Units	MECH-13A Automatic Fault Detection & Diagnostics for Air & Zone	MECH-14A Distributed Energy Storage DX AC Systems	MECH-15A Thermal Energy Storage (TES) Systems	Test Performed By:
Carrier 50HJQ006	*1*	☐	☐	☐	☐	**MECH. CONT.**

EnergyPro 5.1 by EnergySoft *User Number: 1126* ***RunCode: 2012-03-10T11:20:20*** *ID: 1203A* *Page 12 of 20*

CERTIFICATE OF COMPLIANCE and FIELD INSPECTION ENERGY CHECKLIST (Part 3 of 4) — MECH-1C

Project Name: *Rancho Shopping Center A* — Date: *3/10/2012*

Required Acceptance Tests

Designer:

This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for mechanical systems. The designer is required to check the applicable boxes by all acceptance tests that apply and listed all equipment that requires an acceptance test. If all equipment of a certain type requires a test, list the equipment description and the number of systems. The NA number designates the Section in the Appendix of the Nonresidential Reference Appendices Manual that describes the test. Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

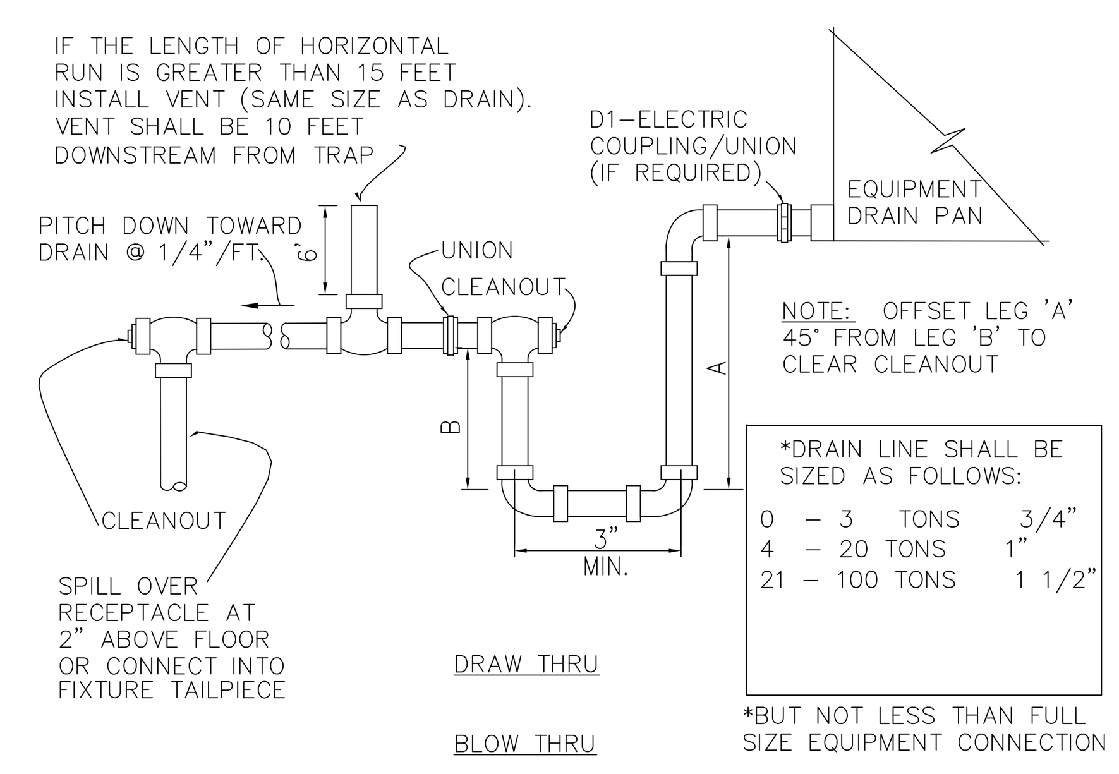
Building Departments:

Systems Acceptance: Before occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all control devices serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance.
Systems Acceptance: Before occupancy permit is granted. All newly installed HVAC equipment must be tested using the Acceptance Requirements.

The MECH-1C form is not considered a completed form and is not to be accepted by the building department unless the correct boxes are checked. The equipment requiring testing, person performing the test (Example: HVAC installer, TAB contractor, controls contractor, PE in charge of project) and what Acceptance test must be conducted. The following checked-off forms are required for **ALL** newly installed equipment. In addition a Certificate of Acceptance forms shall be submitted to the building department that certifies plans, specifications, installation, certificates, and operating and maintenance information meet the requirements of §10-103(b) and Title-24 Part 6. The building inspector must receive the properly filled out and signed forms before the building can receive final occupancy.

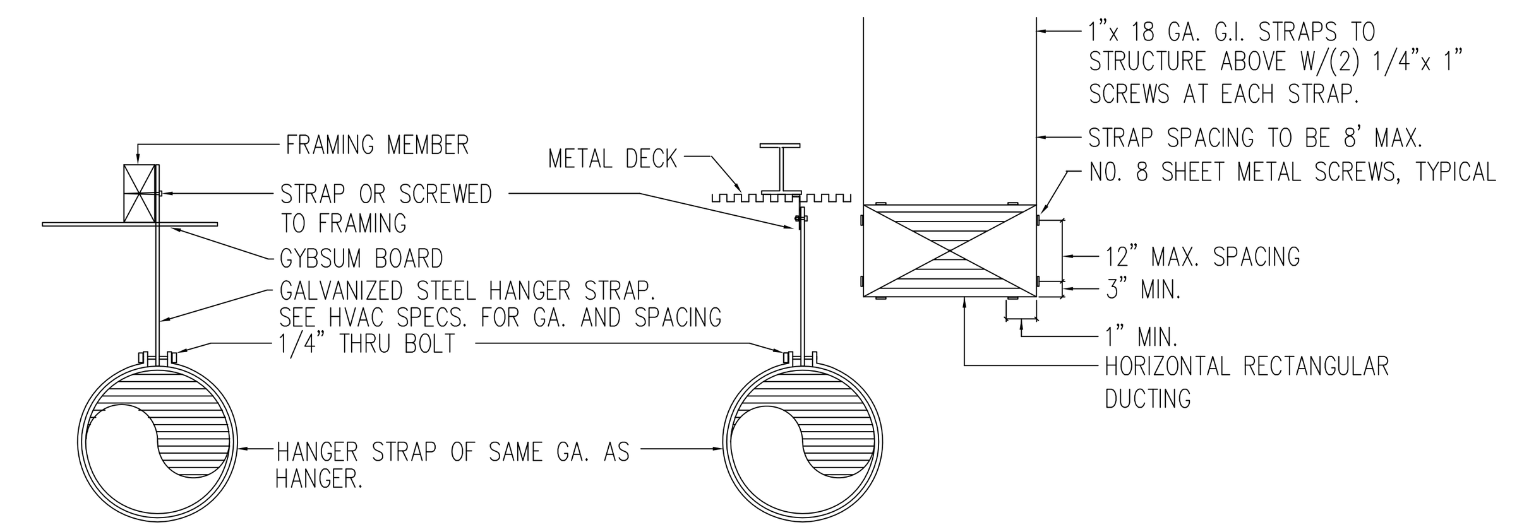
TEST DESCRIPTION Equipment Requiring Testing or Verification	Qty.	MECH-2A Outdoor Ventilation For VAV & CAV	MECH-3A Constant Volume & Single-Zone Unitary	MECH-4A Air Distribution Ducts	MECH-5A Economizer Controls	MECH-6A Demand Control Ventilation DCV	MECH-7A Supply Fan VAV	MECH-8A Valve Leakage Test	MECH-9A Supply Water Temp. Reset	MECH-10A Hydronic System Variable Flow Control	MECH-11A Automatic Demand Shed Control
Carrier 50HJQ006	*1*	☐	☑	☐	☑	☑	☐	☐	☐	☐	☑

EnergyPro 5.1 by EnergySoft *User Number: 1126* ***RunCode: 2012-03-10T11:20:20*** *ID: 1203A* *Page 11 of 20*



UNIT TYPE	A	B
DRAW-THRU	S.P. x 1.5 + 2"	S.P. x 0.5 + 1"
S.P.= SYSTEM STATIC PRESSURE (INCHES)		
BLOW-THRU	S.P. x 1.5 + 2"	S.P. x 1.5 + 2"

A/C UNIT COND. DRAIN & TRAP DETAIL
SCALE: NONE — 2



AS PER CHAPTER 6

0-12	13-24	25-30	31-54	55-60	61-84	85 +	DUCT SIZE
26	24	22	22	20	20	18	GAUGE

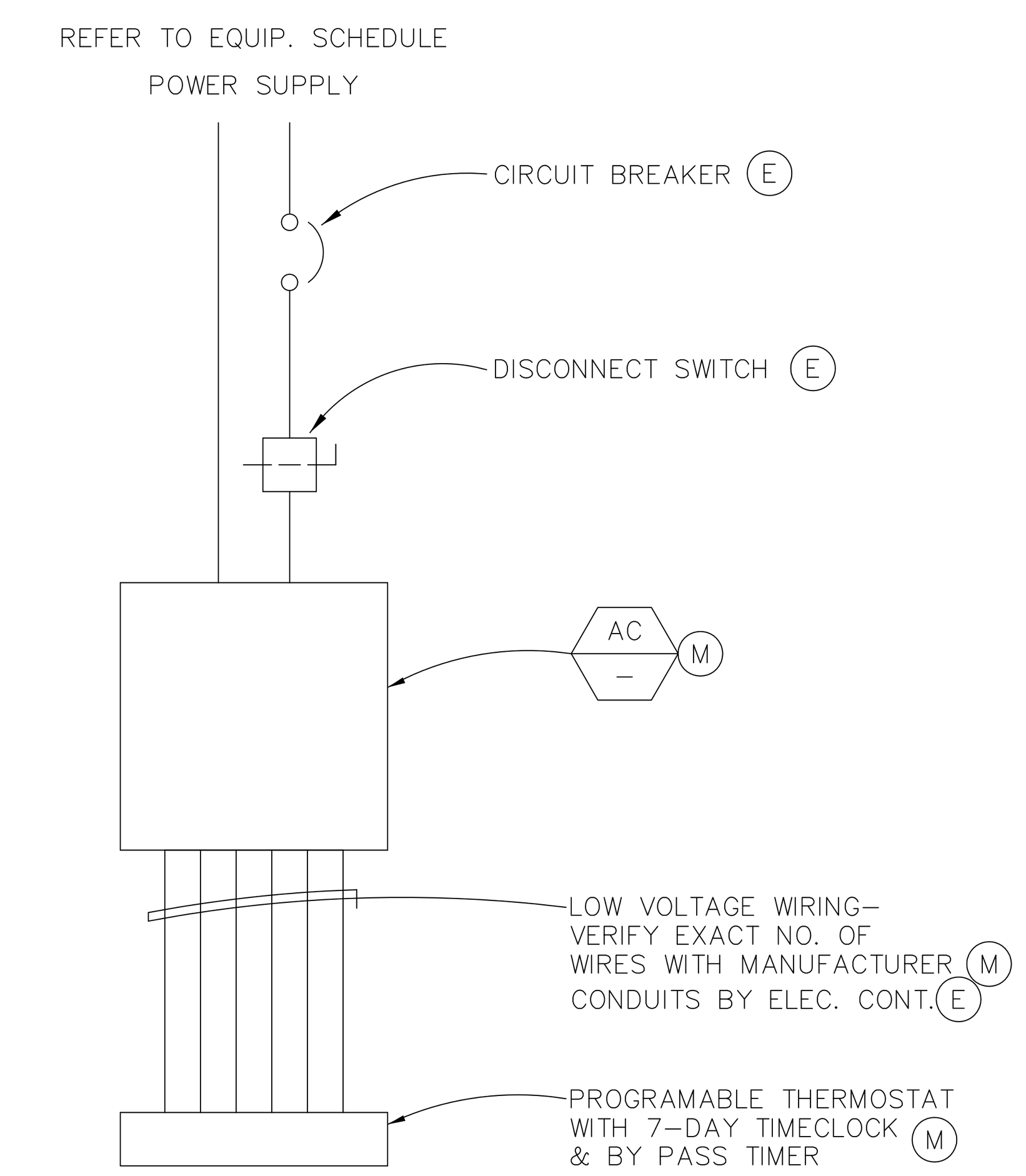
MINIMUM HANGER SIZES FOR ROUND DUCT

DIA.	MAXIMUM SPACING	WIRE DIA.	ROD	STRAP
10" dn	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.
25-36"	12'	TWO 8 GA.	3/8"	1"x 20 ga.
37-50"	12'		TWO 3/8"	TWO 1"x 20 ga.
51-60"	12'		TWO 3/8"	TWO 1"x 18 ga.
61-84"	12'		TWO 3/8"	TWO 1"x 16 ga.

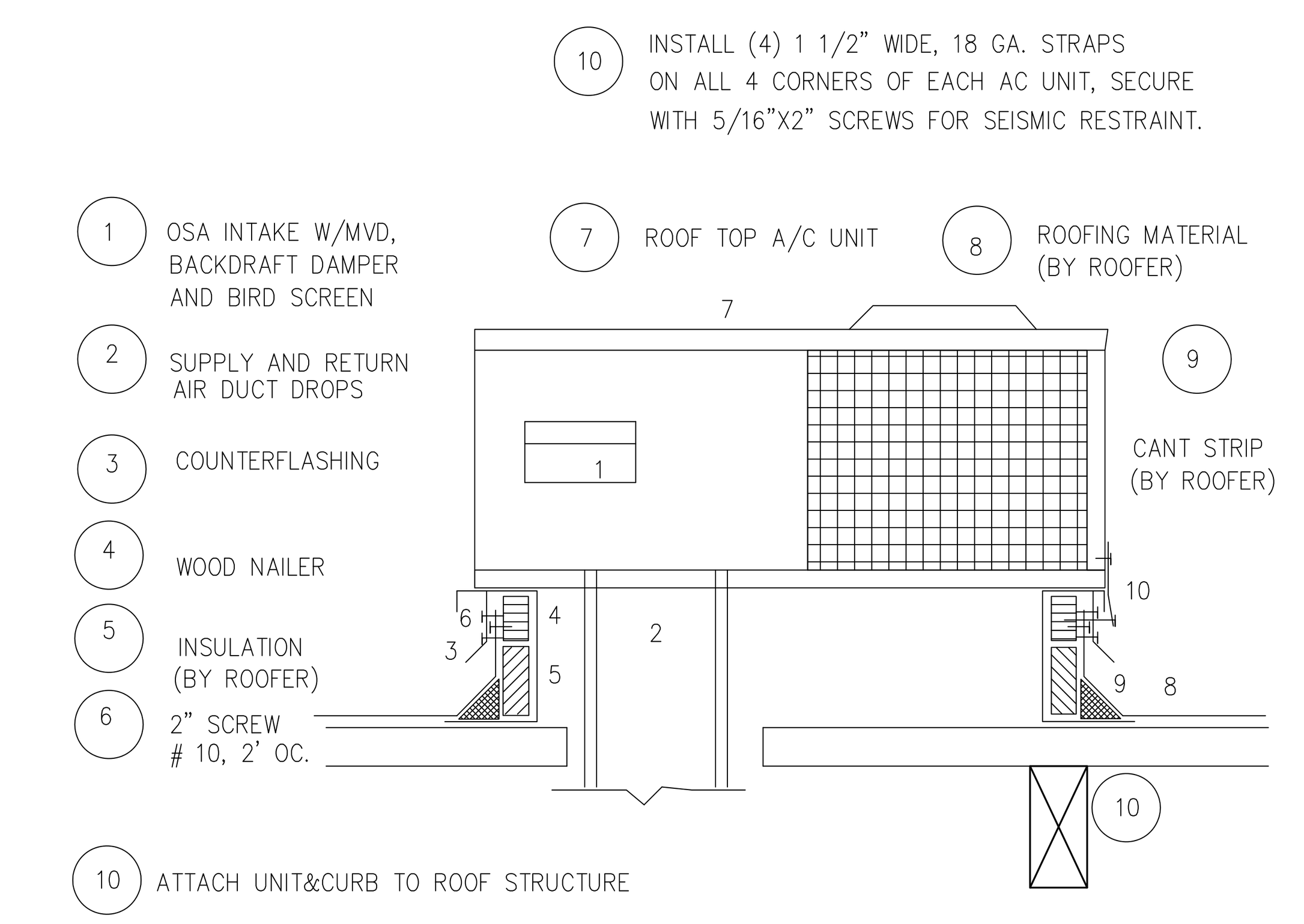
NOTES: (THE CHAPTERS AND FIGURES INDICATED IN THIS DETAIL REFER TO SMACNA DUCT CONSTRUCTION STANDARD.)

1. STRAPS ARE GALVANIZED STEEL; RODS ARE UNCOATED OR GALVANIZED STEEL; WIRE IS BLACK ANNEALED, BRIGHT BASIC OR GALVANIZED STEEL. ALL ARE ALTERNATIVES.
2. SEE FIGURE 4-4 FOR LOWER SUPPORTS.
3. SEE FIGURES 4-2 AND 4-3 FOR UPPER ATTACHMENTS.
4. TABLE ALLOWS FOR CONVENTIONAL WALL THICKNESS, AND JOINT SYSTEMS PLUS ONE lb/SF OF INSULATION WEIGHT. IF HEAVIER DUCTS ARE TO BE INSTALLED, ADJUST HANGER SIZES TO BE WITHIN THEIR LOAD LIMITS; SEE ALLOWABLE LOADS. WITH TABLE 4-1.
5. DESIGNERS; FOR INDUSTRIAL GRADE SUPPORTS, INCLUDING SADDLES, SINGLE POINT TRAPEZE LOADS, LONGER SPANS AND FLANGED JOINT LOADS, SEE SMACNA'S ROUND INDUSTRIAL DUCT CONSTRUCTION STANDARDS.
6. SEE FIGURES 3-9 AND 3-10 FOR FLEXIBLE DUCT SUPPORTS.

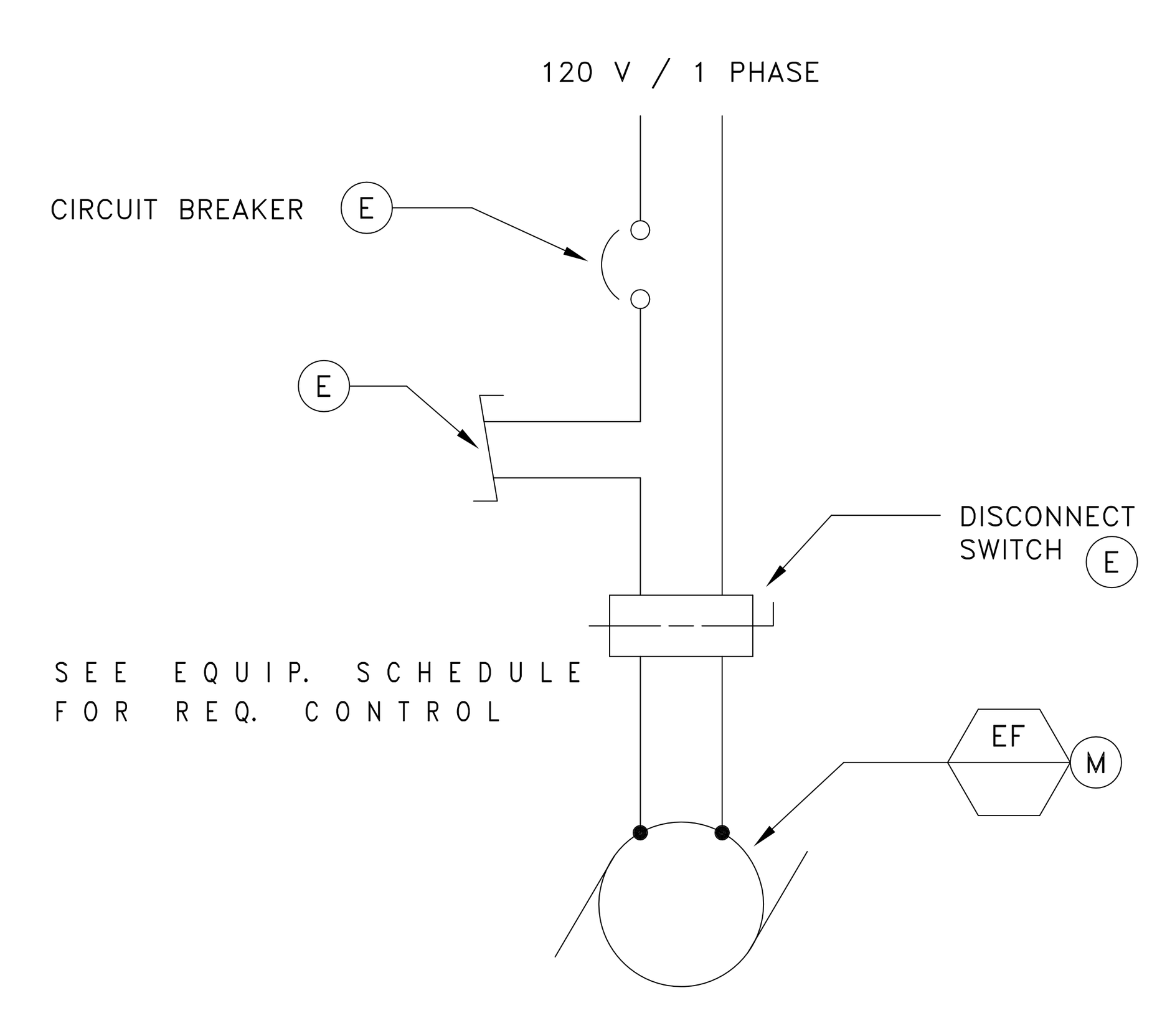
SUPPORT SCHEDULE FOR DUCT SIZE AND DUCT GAUGE
SCALE: NONE — 1



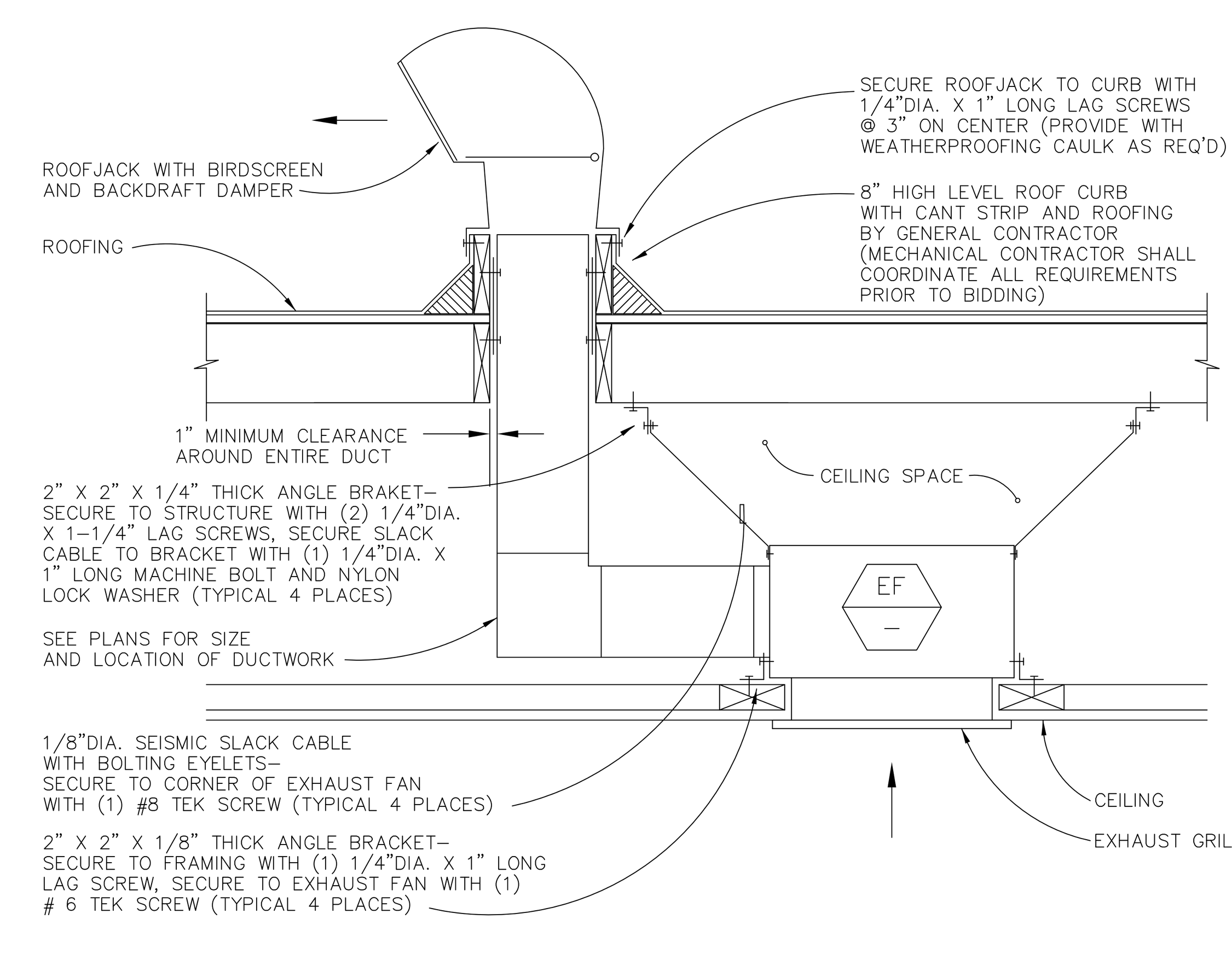
TEMP. CONTROL DIAGRAM
SCALE: NONE — 6



ROOF UNIT MOUNTING DETAIL
SCALE: NONE — 5



EXHAUST FAN WIRING DIAGRAM
SCALE: NONE — 10



EXHAUST FAN DETAIL
SCALE: NONE — 9

REVISIONS
DATE

DEVELOPER:
CALIFORNIA LIBERTY INVESTMENTS
537 CERES AVE
LOS ANGELES, CA 90013

PROJECT:
FOOTHILL RANCHO PLAZA
9606 FOOTHILL BLVD
RANCHO CUCAMONGA, CA

SMA
MECHANICAL ENGINEER
524 TOPSIDE PLACE
DIAMOND BAR, CA 91765
(909)860-9844 FAX(425)660-7567

GEORGE BEHNAM, AIA
ARCHITECT
1150 E. ORANGETHORPE # 109
PLACENTIA, CA 92870
(714)572-2384 FAX(714)572-2385
E-mail : GBehnam@sbcglobal.net

PROJECT NO:	120102
CAD DWG FILE:	
DRAWN BY :	M.M.
CHECKED BY:	G.B.
SCALE:	NOTED
DATE :	04-08-12
SHEET TITLE:	DETAILS

SHEET M-3
4 OF 7

MECHANICAL MANDATORY MEASURES: NONRESIDENTIAL — MECH-MM

Project Name	Date
Rancho Shopping Center A	*3/10/2012*

Equipment and System Efficiencies

§111:	Any appliance for which there is a California standard established in the Appliance Efficiency Regulations will comply with the applicable standard.
§115(a):	Fan type central furnaces shall not have a pilot light.
§123:	Piping, except that conveying fluids at temperatures between 60 and 105 degrees Fahrenheit, or within HVAC equipment, shall be insulated in accordance with Standards Section 123.
§124:	Air handling duct systems shall be installed and insulated in compliance with Sections 601, 602, 603, 604, and 605 of the CMC Standards.

Controls

§122(e):	Each space conditioning system shall be installed with one of the following:
1A.	Each space conditioning system serving building types such as offices and manufacturing facilities (and all others not explicitly exempt from the requirements of Section 112 (d)) shall be installed with an automatic time switch with an accessible manual override that allows operation of the system during off-hours for up to 4 hours. The time switch shall be capable of programming different schedules for weekdays and weekends and have program backup capabilities that prevent the loss of the device's program and time setting for at least 10 hours if power is interrupted; or
1B.	An occupancy sensor to control the operating period of the system; or
1C.	A 4-hour timer that can be manually operated to control the operating period of the system.
2.	Each space conditioning system shall be installed with controls that temporarily restart and temporarily operate the system as required to maintain a setback heating and/or a setup cooling thermostat setpoint.
§122(g):	Each space conditioning system serving multiple zones with a combined conditioned floor area more than 25,000 square feet shall be provided with isolation zones. Each zone: shall not exceed 25,000 square feet; shall be provided with isolation devices, such as valves or dampers that allow the supply of heating or cooling to be setback or shut off independently of other isolation areas; and shall be controlled by a time control device as described above.
§122(c):	Thermostats shall have numeric setpoints in degrees Fahrenheit (F) and adjustable setpoint stops accessible only to authorized personnel.
§122(b):	Heat pumps shall be installed with controls to prevent electric resistance supplementary heater operation when the heating load can be met by the heat pump alone
§122(a&b):	Each space conditioning system shall be controlled by an individual thermostat that responds to temperature within the zone. Where used to control heating, the control shall be adjustable down to 55 degrees F or lower. For cooling, the control shall be adjustable up to 85 degrees F or higher. Where used for both heating and cooling, the control shall be capable of providing a deadband of at least 5 degrees F within which the supply of heating and cooling is shut off or reduced to a minimum.

Ventilation

§121(e):	Controls shall be provided to allow outside air dampers or devices to be operated at the ventilation rates as specified on these plans.
§122(f):	All gravity ventilating systems shall be provided with automatic or readily accessible manually operated dampers in all openings to the outside, except for combustion air openings.
§121(f):	Ventilation System Acceptance. Before an occupancy permit is granted for a newly constructed building or space, or a new ventilating system serving a building or space is operated for normal use, all ventilation systems serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance

Service Water Heating Systems

§113(c)	Installation
3.	Temperature controls for public lavatories. The controls shall limit the outlet Temperature to 110°F.
2.	Circulating service water-heating systems shall have a control capable of automatically turning off the circulating pump when hot water is not required.

CERTIFICATE OF COMPLIANCE AND FIELD INSPECTION ENERGY CHECKLIST (Part 1 of 3) ENV-1C

Project Name			Date
Rancho Shopping Center A			*3/10/2012*
Project Address	Climate Zone	Total Cond. Floor Area	Addition Floor Area
9606 Foothill Blvd. Rancho Cucamonga	*10*	*1,228*	*n/a*

GENERAL INFORMATION

Building Type: ☒ Nonresidential ☐ High-Rise Residential ☐ Hotel/Motel Guest Room
☐ Schools (Public School) ☐ Relocatable Public School Bldg. ☒ Conditioned Spaces ☐ Unconditioned Spaces
☐ Skylight Area for Large Enclosed Space ≥ 8000 ft² (If checked include the ENV-4C with submittal)
Phase of Construction: ☒ New Construction ☐ Addition ☐ Alteration
Approach of Compliance: ☐ Component ☒ Overall Envelope ☐ Unconditioned (file affidavit)
Front Orientation: N, E, S, W or in Degrees: *0 deg*

FIELD INSPECTION ENERGY CHECKLIST

OPAQUE SURFACE DETAILS / INSULATION

Tag/ID	Assembly Type	Area (ft²)	Orientation N, E, S, W	U-Factor	Cavity R-Value	Exterior R-Value	Exterior Furring[3]	Interior R-Value	Interior Furring[3]	Joint Appendix 4	Condition Status	Pass	Fail[2]
1	Wall	154	(N)	0.102	R-13					4.3.1-A3	New	☐	☐
2	Wall	160	(E)	0.102	R-13					4.3.1-A3	New	☐	☐
3	Wall	96	(S)	0.102	R-13					4.3.1-A3	New	☐	☐
4	Wall	272	(W)	0.102	R-13					4.3.1-A3	New	☐	☐
5	Wall	194	(SE)	0.102	R-13					4.3.1-A3	New	☐	☐
6	Wall	104	(NE)	0.102	R-13					4.3.1-A3	New	☐	☐
7	Wall	61	(SW)	0.102	R-13					4.3.1-A3	New	☐	☐
8	Roof	1,228	(N)	0.031	R-30					4.2.1-A20	New	☐	☐
9	Slab	1,228	(N)	0.730	None					4.4.7-A1	New	☐	☐
												☐	☐

1. See Instructions in the Nonresidential Compliance Manual, page 3-96.
2. If Fail, then describe on Page 2 of the Inspection Checklist Form and take appropriate action to correct. A fail does not meet compliance.

FENESTRATION SURFACE DETAILS

Tag/ID	Fenestration Type	Area (ft²)	Orientation N, E, S, W	Max U-Factor	U-Factor Source	Max (R)SHGC	SHGC Source	Overhang	Conditions Status	Pass	Fail[2]
1	Window	56	(N)	0.390	NFRC	0.370	NFRC	☐	New	☐	☐
2	Window	24	(S)	0.390	NFRC	0.370	NFRC	☐	New	☐	☐
3	Window	158	(W)	0.390	NFRC	0.370	NFRC	☐	New	☐	☐
4	Window	136	(SE)	0.390	NFRC	0.370	NFRC	☐	New	☐	☐
5	Window	96	(NE)	0.390	NFRC	0.370	NFRC	☐	New	☐	☐
6	Window	24	(SW)	0.390	NFRC	0.370	NFRC	☐	New	☐	☐
								☐		☐	☐
								☐		☐	☐
								☐		☐	☐
								☐		☐	☐

1. See Instructions in the Nonresidential Compliance Manual, page 3-96.
2. If Fail then describe on Page 2 of the Inspection Checklist Form and take appropriate action to correct. Verify building plans if necessary.

PERFORMANCE CERTIFICATE OF COMPLIANCE (Part 1 of 3) PERF-1C

Project Name			Date
Rancho Shopping Center A			*3/10/2012*
Project Address	Climate Zone	Total Cond. Floor Area	Addition Floor Area
9606 Foothill Blvd. Rancho Cucamonga	*CA Climate Zone 10*	*1,228*	*n/a*

GENERAL INFORMATION

Building Type: ☒ Nonresidential ☐ High-Rise Residential ☐ Hotel/Motel Guest Room ☐ Relocatable - indicate ☐ specific climate zone ☐ all climates
Phase of Construction: ☒ New Construction ☐ Addition ☐ Alteration

STATEMENT OF COMPLIANCE

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 and 6 of the California Code of Regulations. This certificate applies only to a Building using the performance compliance approach.

The documentation author hereby certifies that the documentation is accurate and complete.

Documentation Author

Name	*S. MORCOS*	Signature	
Company	*CALIFORNIA LIVING & ENERGY*	Date	*3/10/2012*
Address	*20101 E. VALLEY BLVD., SUITE "E"*	Phone	*(909) 860-9844*
City/State/Zip	*WALNUT, CA 91789*		

The Principal Designer hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application. The proposed building has been designed to meet the energy efficiency requirements contained in sections 110, 116 through 118, and 140 through 149 of Title 24, Part 6. Please check one:

ENV.	LTG.	MECH.	
☐	☐	☐	I hereby affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document as the person responsible for its preparation; and that I am licensed in the State of California as a civil engineer, mechanical engineer, electrical engineer, or I am a licensed architect.
☐	☐	☐	I affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code by section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.
☐	☐	☐	I affirm that I am eligible under Division 3 of the Business and Professions Code to sign this document because it pertains to a structure or type of work described as exempt pursuant to Business and Professions Code Sections 5537, 5538 and 6737.1.

Principal Envelope Designer

Name	*GEORGE BEHNAM*	Signature	
Company	*GEORGE BEHNAM, A R C H I T E C T*	Date	
Address	*1150 E. ORANGETHORPE # 109*	License #	
City/State/Zip	*PLACENTIA, CA 92870*	Phone	*(714) 572-2384*

Principal Mechanical Designer

Name	*S. Morcos*	Signature	
Company	*SMA*	Date	
Address	*524 Topside Pl*	License #	
City/State/Zip	*Diamond Bar, CA 91765*	Phone	*(909) 860-9844*

Principal Lighting Designer

Name		Signature	
Company	*Lighting Compliance Not In The Scope Of This Submittal*	Date	
Address		License #	
City/State/Zip		Phone	

INSTRUCTIONS TO APPLICANT COMPLIANCE & WORKSHEETS (check box if worksheets are included)

☒	ENV-1C	Certificate of Compliance. Required on plans.	☒	MECH-1C	Certificate of Compliance. Required on plans.
☐	LTG-1C	Certificate of Compliance. Required on plans.	☒	MECH-2C	Air/Water Side/Service Hot Water & Pool Requirements.
☐	LTG-2C	Lighting Controls Credit Worksheet.	☒	MECH-3C	Mechanical Ventilation and Reheat.
☐	LTG-3C	Indoor Lighting Power Allowance.	☒	MECH-5C	Mechanical Equipment Details.

PERFORMANCE CERTIFICATE OF COMPLIANCE (Part 1 of 3) PERF-1C

Project Name			Date
Rancho Shopping Center B			*3/10/2012*
Project Address	Climate Zone	Total Cond. Floor Area	Addition Floor Area
9606 Foothill Blvd. Rancho Cucamonga	*CA Climate Zone 10*	*4,788*	*n/a*

GENERAL INFORMATION

Building Type: ☒ Nonresidential ☐ High-Rise Residential ☐ Hotel/Motel Guest Room ☐ Relocatable - indicate ☐ specific climate zone ☐ all climates
Phase of Construction: ☒ New Construction ☐ Addition ☐ Alteration

STATEMENT OF COMPLIANCE

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 and 6 of the California Code of Regulations. This certificate applies only to a Building using the performance compliance approach.

The documentation author hereby certifies that the documentation is accurate and complete.

Documentation Author

Name	*S. MORCOS*	Signature	
Company	*CALIFORNIA LIVING & ENERGY*	Date	*3/10/2012*
Address	*20101 E. VALLEY BLVD., SUITE "E"*	Phone	*(909) 860-9844*
City/State/Zip	*WALNUT, CA 91789*		

The Principal Designer hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application. The proposed building has been designed to meet the energy efficiency requirements contained in sections 110, 116 through 118, and 140 through 149 of Title 24, Part 6. Please check one:

ENV.	LTG.	MECH.	
☐	☐	☐	I hereby affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document as the person responsible for its preparation; and that I am licensed in the State of California as a civil engineer, mechanical engineer, electrical engineer, or I am a licensed architect.
☐	☐	☐	I affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code by section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.
☐	☐	☐	I affirm that I am eligible under Division 3 of the Business and Professions Code to sign this document because it pertains to a structure or type of work described as exempt pursuant to Business and Professions Code Sections 5537, 5538 and 6737.1.

Principal Envelope Designer

Name	*GEORGE BEHNAM*	Signature	
Company	*GEORGE BEHNAM, A R C H I T E C T*	Date	
Address	*1150 E. ORANGETHORPE # 109*	License #	
City/State/Zip	*PLACENTIA, CA 92870*	Phone	*(714) 572-2384*

Principal Mechanical Designer

Name	*S. Morcos*	Signature	
Company	*SMA*	Date	
Address	*524 Topside Pl*	License #	
City/State/Zip	*Diamond Bar, CA 91765*	Phone	*(909) 860-9844*

Principal Lighting Designer

Name		Signature	
Company	*Lighting Compliance Not In The Scope Of This Submittal*	Date	
Address		License #	
City/State/Zip		Phone	

INSTRUCTIONS TO APPLICANT COMPLIANCE & WORKSHEETS (check box if worksheets are included)

☒	ENV-1C	Certificate of Compliance. Required on plans.	☒	MECH-1C	Certificate of Compliance. Required on plans.
☐	LTG-1C	Certificate of Compliance. Required on plans.	☒	MECH-2C	Air/Water Side/Service Hot Water & Pool Requirements.
☐	LTG-2C	Lighting Controls Credit Worksheet.	☒	MECH-3C	Mechanical Ventilation and Reheat.
☐	LTG-3C	Indoor Lighting Power Allowance.	☒	MECH-5C	Mechanical Equipment Details.

ENVELOPE MANDATORY MEASURES: NONRESIDENTIAL — ENV-MM

Project Name	Date
Rancho Shopping Center A	*3/10/2012*

DESCRIPTION

Building Envelope Measures:

§118(a):	Installed insulating material shall have been certified by the manufacturer to comply with the California Quality Standards for insulating material, Title 20 Chapter 4, Article 3.
§118(c):	All Insulating Materials shall be installed in compliance with the flame spread rating and smoke density requirements of Sections 2602 and 707 of Title 24, Part 2.
§118(f):	The opaque portions of framed demising walls in nonresidential buildings shall have insulation with an installed R-value of no less than R-13 between framing members.
§117(a):	All Exterior Joints and openings in the building that are observable sources of air leakage shall be caulked, gasketed, weatherstripped or otherwise sealed.
§116(a) 1:	Manufactured fenestration products and exterior doors shall have air infiltration rates not exceeding 0.3 cfm/ft.² of window area, 0.3 cfm/ft.² of door area for residential doors, 0.3 cfm/ft.² of door area for nonresidential single doors (swinging and sliding), and 1.0 cfm/ft.² for nonresidential double doors (swinging).
§116(a) 2:	Fenestration U-factor shall be rated in accordance with NFRC 100, or the applicable default U-factor.
§116(a) 3:	Fenestration SHGC shall be rated in accordance with NFRC 200, or NFRC 100 for site-built fenestration, or the applicable default SHGC.
§116(b):	Site Constructed Doors, Windows and Skylights shall be caulked between the unit and the building, and shall be weatherstripped (except for unframed glass doors and fire doors).

CERTIFICATE OF COMPLIANCE AND FIELD INSPECTION ENERGY CHECKLIST (Part 3 of 3) ENV-1C

Project Name	Date
Rancho Shopping Center A	*3/10/2012*

Required Acceptance Tests

Designer:

This form is to be used by the designer and attached to the plans. Listed below is the acceptance test for Envelope Fenestrations system. The designer is required to check the acceptance tests and list all the fenestration products that require an acceptance test. If all the site-built fenestration of a certain type requires a test, list the different fenestration products and the number of systems. The NA7 Section in the Appendix of the Nonresidential Reference Appendices Manual describes the test. Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

Enforcement Agency:

Systems Acceptance. Before Occupancy Permit is granted for a newly constructed building or space or whenever new fenestration is installed in the building or space shall be certified as meeting the Acceptance Requirements. The ENV-2A form is not considered a complete form and is not to be accepted by the enforcement agency unless the boxes are checked and/or filled and signed. In addition, a Certificate of Acceptance forms shall be submitted to the enforcement agency that certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of §10-103(b) of Title 24 Part 6. The field inspector must receive the properly filled out and signed forms before the building can receive final occupancy. A copy of the ENV-2A for each different fenestration product line must be provided to the owner of the building for their records.

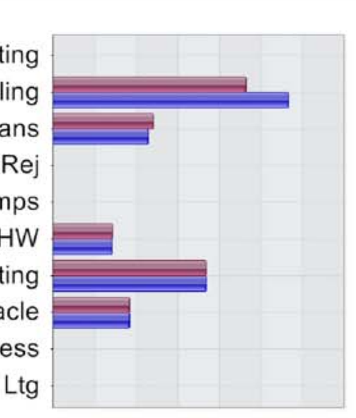
Test Description: Fenestration Products Name or ID Requiring Testing or Verification	Area of like Products	ENV-2A: Building Envelope Acceptance Test	Test Performed By:
Milgard Classic Low-E Vinyl	494	☒	
		☐	

PERFORMANCE CERTIFICATE OF COMPLIANCE (Part 2 of 3) PERF-1C

Project Name	Date
Rancho Shopping Center A	*3/10/2012*

ANNUAL TDV ENERGY USE SUMMARY (kBtu/sqft-yr)

Energy Component	Standard Design	Proposed Design	Compliance Margin
Space Heating	0.06	0.02	0.04
Space Cooling	282.84	231.62	51.23
Indoor Fans	114.00	120.65	-6.65
Heat Rejection	0.00	0.00	0.00
Pumps & Misc.	0.00	0.00	0.00
Domestic Hot Water	70.68	71.29	-0.61
Lighting	184.09	184.09	0.00
Receptacle	91.38	91.38	0.00
Process	0.00	0.00	0.00
Process Lighting	0.00	0.00	0.00
TOTALS	743.06	699.05	44.01
Percent better than Standard		5.9 %	(5.9 % excluding process)



BUILDING COMPLIES

GENERAL INFORMATION

Building Orientation	(N) 0 deg	Conditioned Floor Area	1,228	sqft.
Number of Stories	1	Unconditioned Floor Area	0	sqft.
Number of Systems	1	Conditioned Footprint Area	1,228	sqft.
Number of Zones	1	Natural Gas Available On Site	Yes	

	Orientation	Gross Area		Glazing Area		Glazing Ratio
Front Elevation	(N)	410	sqft.	152	sqft.	37.1 %
Left Elevation	(E)	490	sqft.	136	sqft.	27.8 %
Rear Elevation	(S)	205	sqft.	48	sqft.	23.4 %
Right Elevation	(W)	430	sqft.	158	sqft.	36.7 %
Total		1,535	sqft.	494	sqft.	32.2 %
Roof		1,228	sqft.	0	sqft.	0.0 %

	Standard		Proposed		
Prescriptive Lighting Power Density	1.600	W/sqft.	1.600	W/sqft.	Prescriptive Values for Comparison only. See LTG-1C for allowed LPD.
Prescriptive Envelope TDV Energy	46,596		62,988		

Remarks:

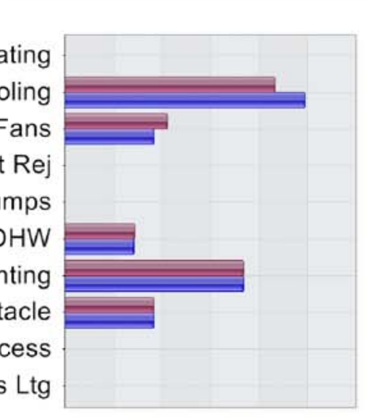
Standard Building (Compliance)

PERFORMANCE CERTIFICATE OF COMPLIANCE (Part 2 of 3) PERF-1C

Project Name	Date
Rancho Shopping Center B	*3/10/2012*

ANNUAL TDV ENERGY USE SUMMARY (kBtu/sqft-yr)

Energy Component	Standard Design	Proposed Design	Compliance Margin
Space Heating	0.35	0.14	0.21
Space Cooling	247.52	216.43	31.09
Indoor Fans	91.39	105.62	-14.23
Heat Rejection	0.00	0.00	0.00
Pumps & Misc.	0.00	0.00	0.00
Domestic Hot Water	70.69	71.30	-0.61
Lighting	184.09	184.09	0.00
Receptacle	91.38	91.38	0.00
Process	0.00	0.00	0.00
Process Lighting	0.00	0.00	0.00
TOTALS	685.43	668.97	16.46
Percent better than Standard		2.4 %	(2.4 % excluding process)



BUILDING COMPLIES

GENERAL INFORMATION

Building Orientation	(N) 0 deg	Conditioned Floor Area	4,788	sqft.
Number of Stories	1	Unconditioned Floor Area	0	sqft.
Number of Systems	6	Conditioned Footprint Area	4,788	sqft.
Number of Zones	4	Natural Gas Available On Site	Yes	

	Orientation	Gross Area		Glazing Area		Glazing Ratio
Front Elevation	(N)	1,320	sqft.	585	sqft.	44.3 %
Left Elevation	(E)	350	sqft.	166	sqft.	47.4 %
Rear Elevation	(S)	1,575	sqft.	732	sqft.	46.5 %
Right Elevation	(W)	366	sqft.	160	sqft.	43.7 %
Total		3,611	sqft.	1,643	sqft.	45.5 %
Roof		4,788	sqft.	0	sqft.	0.0 %

	Standard		Proposed		
Prescriptive Lighting Power Density	1.600	W/sqft.	1.600	W/sqft.	Prescriptive Values for Comparison only. See LTG-1C for allowed LPD.
Prescriptive Envelope TDV Energy	138,620		194,619		

Remarks:

Standard Building (Compliance)

REVISIONS
DATE

DEVELOPER:
CALIFORNIA LIBERTY INVESTMENTS
537 CERES AVE
LOS ANGELES, CA 90013

PROJECT:
FOOTHILL RANCHO PLAZA
9606 FOOTHILL BLVD
RANCHO CUCAMONGA, CA

SMA
MECHANICAL ENGINEER
524 TOPSIDE PLACE
DIAMOND BAR, CA 91765
(909)860-9844 FAX(425)660-7567

GEORGE BEHNAM, AIA
A R C H I T E C T
1150 E. ORANGETHORPE # 109
PLACENTIA, CA 92870
(714)572-2384 FAX(714)572-2385
E-mail : GBehnam@sbcglobal.net

PROJECT NO:	120102
CAD DWG FILE:	
DRAWN BY :	M.M.
CHECKED BY:	G.B.
SCALE:	NOTED
DATE :	04-08-12

SHEET TITLE:

T-24 FORMS

SHEET
M-4
5 OF 7

CERTIFICATE OF COMPLIANCE AND FIELD INSPECTION ENERGY CHECKLIST (Part 3 of 3) ENV-1C

Project Name	Date
Rancho Shopping Center B	*3/10/2012*

Required Acceptance Tests

Designer:

This form is to be used by the designer and attached to the plans. Listed below is the acceptance test for Envelope Fenestrations system. The designer is required to check the acceptance tests and list all the fenestration products that require an acceptance test. If all the site-built fenestration of a certain type requires a test, list the different fenestration products and the number of systems. The NA7 Section in the Appendix of the Nonresidential Reference Appendices Manual describes the test. Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

Enforcement Agency:

Systems Acceptance. Before Occupancy Permit is granted for a newly constructed building or space or whenever new fenestration is installed in the building or space shall be certified as meeting the Acceptance Requirements. The ENV-2A form is not considered a complete form and is not to be accepted by the enforcement agency unless the boxes are checked and/or filled and signed. In addition, a Certificate of Acceptance forms shall be submitted to the enforcement agency that certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of §10-103(b) of Title 24 Part 6. The field inspector must receive the properly filled out and signed forms before the building can receive final occupancy. A copy of the ENV-2A for each different fenestration product line must be provided to the owner of the building for their records.

Test Description		ENV-2A	Test Performed By:
Fenestration Products Name or ID Requiring Testing or Verification	Area of like Products	Building Envelope Acceptance Test	
Milgard Classic Low-E Vinyl	*1,643*	☑	
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PERFORMANCE CERTIFICATE OF COMPLIANCE (Part 1 of 3) PERF-1C

Project Name			Date
Rancho Shopping Center C			*3/10/2012*
Project Address	Climate Zone	Total Cond. Floor Area	Addition Floor Area
9606 Foothill Blvd. Rancho Cucamonga	*CA Climate Zone 10*	*4,935*	*n/a*

GENERAL INFORMATION

Building Type: ☑ Nonresidential ☐ High-Rise Residential ☐ Hotel/Motel Guest Room
☐ Relocatable - indicate ☐ specific climate zone ☐ all climates

Phase of Construction: ☑ New Construction ☐ Addition ☐ Alteration

STATEMENT OF COMPLIANCE

This certificate of compliance lists the building features and specifications needed to comply with Title 24, Parts 1 and 6 of the California Code of Regulations. This certificate applies only to a Building using the performance compliance approach.

The documentation author hereby certifies that the documentation is accurate and complete.

Documentation Author

Name	*S. MORCOS*	Signature	
Company	*CALIFORNIA LIVING & ENERGY*	Date	*3/10/2012*
Address	*20101 E. VALLEY BLVD., SUITE "E"*	Phone	*(909) 860-9844*
City/State/Zip	*WALNUT, CA 91789*		

The Principal Designer hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application. The proposed building has been designed to meet the energy efficiency requirements contained in sections 110, 116 through 118, and 140 through 149 of Title 24, Part 6. Please check one:

ENV.	LTG.	MECH.	
☐	☐	☐	I hereby affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document as the person responsible for its preparation; and that I am licensed in the State of California as a civil engineer, mechanical engineer, electrical engineer, or I am a licensed architect.
☐	☐	☐	I affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code by section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.
☐	☐	☐	I affirm that I am eligible under Division 3 of the Business and Professions Code to sign this document because it pertains to a structure or type of work described as exempt pursuant to Business and Professions Code Sections 5537, 5538 and 6737.1.

Principal Envelope Designer

Name	*GEORGE BEHNAM*	Signature	
Company	*GEORGE BEHNAM, A R C H I T E C T*	Date	
Address	*1150 E. ORANGETHORPE # 109*	License #	
City/State/Zip	*PLACENTIA, CA 92870*	Phone	*(714) 572-2384*

Principal Mechanical Designer

Name	*S. Morcos*	Signature	
Company	*SMA*	Date	
Address	*524 Topside Pl*	License #	
City/State/Zip	*Diamond Bar, CA 91765*	Phone	*(909) 860-9844*

Principal Lighting Designer

Name		Signature	
Company	*Lighting Compliance Not In The Scope Of This Submittal*	Date	
Address		License #	
City/State/Zip		Phone	

INSTRUCTIONS TO APPLICANT COMPLIANCE & WORKSHEETS (check box if worksheets are included)

☑	ENV-1C	Certificate of Compliance. Required on plans.	☑	MECH-1C	Certificate of Compliance. Required on plans.
☐	LTG-1C	Certificate of Compliance. Required on plans.	☑	MECH-2C	Air/Water Side/Service Hot Water & Pool Requirements.
☐	LTG-2C	Lighting Controls Credit Worksheet.	☑	MECH-3C	Mechanical Ventilation and Reheat.
☐	LTG-3C	Indoor Lighting Power Allowance.	☑	MECH-5C	Mechanical Equipment Details.

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MECHANICAL VENTILATION AND REHEAT MECH-3C

Project Name	Date
Rancho Shopping Center B	*3/10/2012*

MECHANICAL VENTILATION (§121(b)2)	AREA BASIS			OCCUPANCY BASIS					REHEAT LIMITATION (§144(d)) VAV MINIMUM				
A	B	C	D	E	F	G	H	I	J	K	L	M	N
Zone/System	Condition Area (ft²)	CFM per ft²	Min CFM By Area B X C	Number Of People	CFM per Person	Min CFM by Occupant E X F	REQ'D V.A. Max of D or G	Design Ventilation Air CFM	50% of Design Zone Supply CFM	B X 0.4 CFM / ft²	Max. of Columns H, J, K, 300 CFM	Design Minimum Air Setpoint	Transfer Air
Retail Zone	*2,054*	*0.25*	*514*				*514*	*514*					
Inside Mech. System						*Total*	*514*	*514*					
Retail Zone	*689*	*0.25*	*172*				*172*	*172*					
East Mech. System						*Total*	*172*	*172*					
Retail Zone	*1,239*	*0.25*	*310*				*310*	*310*					
West Mech. System						*Total*	*310*	*310*					
Retail Zone	*806*	*0.25*	*202*				*202*	*202*					
Middle Mech. System						*Total*	*202*	*202*					
				Totals					Column I Total Design Ventilation Air				

C	Minimum ventilation rate per Section §121, Table 121-A.
E	Based on fixed seat or the greater of the expected number of occupants and 50% of the CBC occupant load for egress purposes for spaces without fixed seating.
H	Required Ventilation Air (REQ'D V.A.) is the larger of the ventilation rates calculated on an AREA BASIS or OCCUPANCY BASIS (Column D or G).
I	Must be greater than or equal to H, or use Transfer Air (column N) to make up the difference.
J	Design fan supply CFM (Fan CFM) x 50%; or the design zone outdoor airflow rate per §121.
K	Condition area (ft²) x 0.4 CFM / ft²; or
L	Maximum of Columns H, J, K, or 300 CFM
M	This must be less than or equal to Column L and greater than or equal to the sum of Columns H plus N.
N	Transfer Air must be provided where the Required Ventilation Air (Column H) is greater than the Design Minimum Air (Column M). Where required, transfer air must be greater than or equal to the difference between the Required Ventilation Air (Column H) and the Design Minimum Air (Column M), Column H minus M.

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CERTIFICATE OF COMPLIANCE and FIELD INSPECTION ENERGY CHECKLIST (Part 4 of 4) MECH-1C

Project Name	Date
Rancho Shopping Center B	*3/10/2012*

TEST DESCRIPTION		MECH-12A	MECH-13A	MECH-14A	MECH-15A	
Equipment Requiring Testing	Qty.	Fault Detection & Diagnostics for DX Units	Automatic Fault Detection & Diagnostics for Air & Zone	Distributed Energy Storage DX AC Systems	Thermal Energy Storage (TES) Systems	Test Performed By:
Carrier 50EZ03030	*3*	☐	☐	☐	☐	**MECH. CONT.**
Carrier 50HJQ004	*2*	☐	☐	☐	☐	**MECH. CONT.**
Carrier 50HJQ006	*1*	☐	☐	☐	☐	**MECH. CONT.**
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CERTIFICATE OF COMPLIANCE AND FIELD INSPECTION ENERGY CHECKLIST (Part 1 of 3) ENV-1C

Project Name			Date
Rancho Shopping Center B			*3/10/2012*
Project Address	Climate Zone	Total Cond. Floor Area	Addition Floor Area
9606 Foothill Blvd. Rancho Cucamonga	*10*	*4,788*	*n/a*

GENERAL INFORMATION

Building Type: ☑ Nonresidential ☐ High-Rise Residential ☐ Hotel/Motel Guest Room
☐ Schools (Public School) ☐ Relocatable Public School Bldg. ☑ Conditioned Spaces ☐ Unconditioned Spaces
☐ Skylight Area for Large Enclosed Space ≥ 8000 ft² (If checked include the ENV-4C with submittal)
Phase of Construction: ☑ New Construction ☐ Addition ☐ Alteration
Approach of Compliance: ☐ Component ☑ Overall Envelope ☐ Unconditioned (file affidavit)
Front Orientation: N, E, S, W or in Degrees: *0 deg*

FIELD INSPECTION ENERGY CHECKLIST

OPAQUE SURFACE DETAILS / **INSULATION**

Tag/ID	Assembly Type	Area (ft²)	Orientation N, E, S, W	U-Factor	Cavity R-Value	Exterior R-Value	Exterior Furring[3]	Interior R-Value	Interior Furring[3]	Joint Appendix 4	Condition Status	Pass	Fail[2]
1	*Wall*	*321*	*(N)*	*0.102*	*R-13*					*4.3.1-A3*	*New*	☐	☐
2	*Wall*	*325*	*(S)*	*0.102*	*R-13*					*4.3.1-A3*	*New*	☐	☐
3	*Roof*	*2,054*	*(N)*	*0.031*	*R-30*					*4.2.1-A20*	*New*	☐	☐
4	*Slab*	*2,054*	*(N)*	*0.730*	*None*					*4.4.7-A1*	*New*	☐	☐
5	*Wall*	*134*	*(N)*	*0.102*	*R-13*					*4.3.1-A3*	*New*	☐	☐
6	*Wall*	*184*	*(E)*	*0.102*	*R-13*					*4.3.1-A3*	*New*	☐	☐
7	*Wall*	*128*	*(S)*	*0.102*	*R-13*					*4.3.1-A3*	*New*	☐	☐
8	*Roof*	*689*	*(N)*	*0.031*	*R-30*					*4.2.1-A20*	*New*	☐	☐
9	*Slab*	*689*	*(N)*	*0.730*	*None*					*4.4.7-A1*	*New*	☐	☐
10	*Wall*	*230*	*(N)*	*0.102*	*R-13*					*4.3.1-A3*	*New*	☐	☐

1. See Instructions in the Nonresidential Compliance Manual, page 3-96.
2. If Fail, then describe on Page 2 of the Inspection Checklist Form and take appropriate action to correct. A fail does not meet compliance.

FENESTRATION SURFACE DETAILS

Tag/ID	Fenestration Type	Area (ft²)	Orientation N, E, S, W	Max U-Factor	U-Factor Source	Max (R)SHGC	SHGC Source	Overhang	Conditions Status	Pass	Fail[2]
1	*Window*	*585*	*(N)*	*0.390*	*NFRC*	*0.370*	*NFRC*	☐	*New*	☐	☐
2	*Window*	*708*	*(S)*	*0.390*	*NFRC*	*0.370*	*NFRC*	☐	*New*	☐	☐
3	*Window*	*166*	*(E)*	*0.390*	*NFRC*	*0.370*	*NFRC*	☐	*New*	☐	☐
4	*Window*	*24*	*(W)*	*0.390*	*NFRC*	*0.370*	*NFRC*	☐	*New*	☐	☐
5	*Window*	*24*	*(SW)*	*0.390*	*NFRC*	*0.370*	*NFRC*	☐	*New*	☐	☐
6	*Window*	*136*	*(NW)*	*0.390*	*NFRC*	*0.370*	*NFRC*	☐	*New*	☐	☐
								☐		☐	☐
								☐		☐	☐
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1. See Instructions in the Nonresidential Compliance Manual, page 3-96.
2. If Fail then describe on Page 2 of the Inspection Checklist Form and take appropriate action to correct. Verify building plans if necessary.

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CERTIFICATE OF COMPLIANCE AND FIELD INSPECTION ENERGY CHECKLIST (Part 1 of 3) ENV-1C

Project Name			Date
Rancho Shopping Center B			*3/10/2012*
Project Address	Climate Zone	Total Cond. Floor Area	Addition Floor Area
9606 Foothill Blvd. Rancho Cucamonga	*10*	*4,788*	*n/a*

GENERAL INFORMATION

Building Type: ☑ Nonresidential ☐ High-Rise Residential ☐ Hotel/Motel Guest Room
☐ Schools (Public School) ☐ Relocatable Public School Bldg. ☑ Conditioned Spaces ☐ Unconditioned Spaces
☐ Skylight Area for Large Enclosed Space ≥ 8000 ft² (If checked include the ENV-4C with submittal)
Phase of Construction: ☑ New Construction ☐ Addition ☐ Alteration
Approach of Compliance: ☐ Component ☑ Overall Envelope ☐ Unconditioned (file affidavit)
Front Orientation: N, E, S, W or in Degrees: *0 deg*

FIELD INSPECTION ENERGY CHECKLIST

OPAQUE SURFACE DETAILS / **INSULATION**

Tag/ID	Assembly Type	Area (ft²)	Orientation N, E, S, W	U-Factor	Cavity R-Value	Exterior R-Value	Exterior Furring[3]	Interior R-Value	Interior Furring[3]	Joint Appendix 4	Condition Status	Pass	Fail[2]
11	*Wall*	*274*	*(S)*	*0.102*	*R-13*					*4.3.1-A3*	*New*	☐	☐
12	*Wall*	*12*	*(W)*	*0.102*	*R-13*					*4.3.1-A3*	*New*	☐	☐
13	*Wall*	*61*	*(SW)*	*0.102*	*R-13*					*4.3.1-A3*	*New*	☐	☐
14	*Wall*	*194*	*(NW)*	*0.102*	*R-13*					*4.3.1-A3*	*New*	☐	☐
15	*Roof*	*1,239*	*(N)*	*0.031*	*R-30*					*4.2.1-A20*	*New*	☐	☐
16	*Slab*	*1,239*	*(N)*	*0.730*	*None*					*4.4.7-A1*	*New*	☐	☐
17	*Wall*	*50*	*(N)*	*0.102*	*R-13*					*4.3.1-A3*	*New*	☐	☐
18	*Wall*	*55*	*(S)*	*0.102*	*R-13*					*4.3.1-A3*	*New*	☐	☐
19	*Roof*	*806*	*(N)*	*0.031*	*R-30*					*4.2.1-A20*	*New*	☐	☐
20	*Slab*	*806*	*(N)*	*0.730*	*None*					*4.4.7-A1*	*New*	☐	☐

1. See Instructions in the Nonresidential Compliance Manual, page 3-96.
2. If Fail, then describe on Page 2 of the Inspection Checklist Form and take appropriate action to correct. A fail does not meet compliance.

FENESTRATION SURFACE DETAILS

Tag/ID	Fenestration Type	Area (ft²)	Orientation N, E, S, W	Max U-Factor	U-Factor Source	Max (R)SHGC	SHGC Source	Overhang	Conditions Status	Pass	Fail[2]
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								☐		☐	☐
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								☐		☐	☐

1. See Instructions in the Nonresidential Compliance Manual, page 3-96.
2. If Fail then describe on Page 2 of the Inspection Checklist Form and take appropriate action to correct. Verify building plans if necessary.

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CERTIFICATE OF COMPLIANCE and FIELD INSPECTION ENERGY CHECKLIST (Part 3 of 4) MECH-1C

Project Name	Date
Rancho Shopping Center B	*3/10/2012*

Required Acceptance Tests

Designer:

This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for mechanical systems. The designer is required to check the applicable boxes by all acceptance tests that apply and listed all equipment that requires an acceptance test. If all equipment of a certain type requires a test, list the equipment description and the number of systems. The NA number designates the Section in the Appendix of the Nonresidential Reference Appendices Manual that describes the test. Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

Building Departments:

Systems Acceptance: Before occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all control devices serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance.
Systems Acceptance: Before occupancy permit is granted. All newly installed HVAC equipment must be tested using the Acceptance Requirements.

The MECH-1C form is not considered a completed form and is not to be accepted by the building department unless the correct boxes are checked. The equipment requiring testing, person performing the test (Example: HVAC installer, TAB contractor, controls contractor, PE in charge of project) and what Acceptance test must be conducted. The following checked-off forms are required for **ALL** newly installed equipment. In addition a Certificate of Acceptance forms shall be submitted to the building department that certifies plans, specifications, installation, certificates, and operating and maintenance information meet the requirements of §10-103(b) and Title-24 Part 6. The building inspector must receive the properly filled out and signed forms before the building can receive final occupancy.

TEST DESCRIPTION		MECH-2A	MECH-3A	MECH-4A	MECH-5A	MECH-6A	MECH-7A	MECH-8A	MECH-9A	MECH-10A	MECH-11A
Equipment Requiring Testing or Verification	Qty.	Outdoor Ventilation For VAV & CAV	Constant Volume & Single-Zone Unitary	Air Distribution Ducts	Economizer Controls	Demand Control Ventilation DCV	Supply Fan VAV	Valve Leakage Test	Supply Water Temp. Reset	Hydronic System Variable Flow Control	Automatic Demand Shed Control
Carrier 50EZ03030	*3*	☐	☑	☐	☐	☐	☐	☐	☐	☐	☑
Carrier 50HJQ004	*2*	☐	☑	☐	☑	☑	☐	☐	☐	☐	☑
Carrier 50HJQ006	*1*	☐	☑	☐	☑	☑	☐	☐	☐	☐	☑
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EnergyPro 5.1 by EnergySoft *User Number: 1126* ***RunCode: 2012-03-10T11:29:36*** *ID: 1203B* *Page 14 of 27*

REVISIONS

DATE

DEVELOPER:
CALIFORNIA LIBERTY INVESTMENTS
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9606 FOOTHILL BLVD
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PROJECT NO:	120102
CAD DWG FILE:	
DRAWN BY :	M.M.
CHECKED BY:	G.B.
SCALE:	NOTED
DATE :	04–08–12

SHEET TITLE:

T-24
FORMS

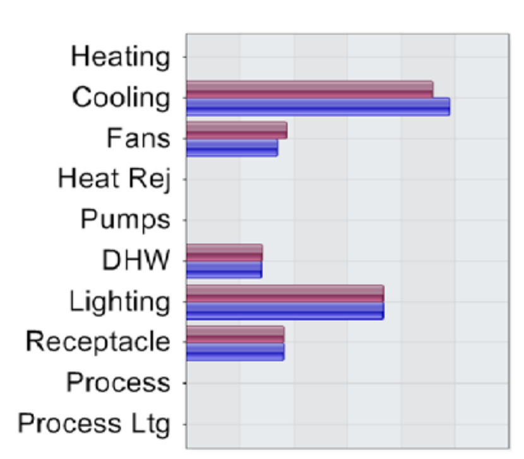
PERFORMANCE CERTIFICATE OF COMPLIANCE (Part 2 of 3) PERF-1C

Project Name: *Rancho Shopping Center C* | Date: *3/10/2012*

ANNUAL TDV ENERGY USE SUMMARY (kBtu/sqft-yr)

Energy Component	Standard Design	Proposed Design	Compliance Margin
Space Heating	0.41	0.18	0.23
Space Cooling	245.55	229.98	15.57
Indoor Fans	86.04	93.74	-7.70
Heat Rejection	0.00	0.00	0.00
Pumps & Misc.	0.00	0.00	0.00
Domestic Hot Water	70.73	71.34	-0.61
Lighting	184.09	184.09	0.00
Receptacle	91.38	91.38	0.00
Process	0.00	0.00	0.00
Process Lighting	0.00	0.00	0.00
TOTALS	678.21	670.71	7.50

Percent better than Standard: 1.1 % (1.1 % excluding process)



BUILDING COMPLIES

GENERAL INFORMATION

Building Orientation	(N) 0 deg	Conditioned Floor Area	4,935	sqft.
Number of Stories	1	Unconditioned Floor Area	0	sqft.
Number of Systems	7	Conditioned Footprint Area	4,935	sqft.
Number of Zones	4	Natural Gas Available On Site	Yes	

	Orientation	Gross Area		Glazing Area		Glazing Ratio
Front Elevation	(N)	1,480	sqft.	776	sqft.	52.4 %
Left Elevation	(E)	420	sqft.	198	sqft.	47.1 %
Rear Elevation	(S)	1,480	sqft.	783	sqft.	52.9 %
Right Elevation	(W)	420	sqft.	166	sqft.	39.5 %
Total		3,800	sqft.	1,923	sqft.	50.6 %
Roof		4,935	sqft.	0	sqft.	0.0 %

	Standard		Proposed		
Prescriptive Lighting Power Density	1.600	W/sqft.	1.600	W/sqft.	Prescriptive Values for Comparison only. See LTG-1C for allowed LPD.
Prescriptive Envelope TDV Energy	143,078		207,898		

Remarks:
Standard Building (Compliance)

CERTIFICATE OF COMPLIANCE AND FIELD INSPECTION ENERGY CHECKLIST (Part 1 of 3) ENV-1C

Project Name: *Rancho Shopping Center C* | Date: *3/10/2012*
Project Address: *9606 Foothill Blvd. Rancho Cucamonga* | Climate Zone: *10* | Total Cond. Floor Area: *4,935* | Addition Floor Area: *n/a*

GENERAL INFORMATION

Building Type: ☒ Nonresidential ☐ High-Rise Residential ☐ Hotel/Motel Guest Room
☐ Schools (Public School) ☐ Relocatable Public School Bldg. ☒ Conditioned Spaces ☐ Unconditioned Spaces
☐ Skylight Area for Large Enclosed Space ≥ 8000 ft² (If checked include the ENV-4C with submittal)
Phase of Construction: ☒ New Construction ☐ Addition ☐ Alteration
Approach of Compliance: ☐ Component ☒ Overall Envelope ☐ Unconditioned (file affidavit)
Front Orientation: N, E, S, W or in Degrees: 0 deg

FIELD INSPECTION ENERGY CHECKLIST

OPAQUE SURFACE DETAILS

Tag/ID	Assembly Type	Area (ft²)	Orientation N, E, S, W	U-Factor	Cavity R-Value	Exterior R-Value	Exterior Furring³	Interior R-Value	Interior Furring³	Joint Appendix 4	Condition Status	Pass	Fail²
1	Wall	436	(N)	0.102	R-13					4.3.1-A3	New	☐	☐
2	Wall	436	(S)	0.102	R-13					4.3.1-A3	New	☐	☐
3	Wall	20	(E)	0.102	R-13					4.3.1-A3	New	☐	☐
4	Wall	70	(W)	0.102	R-13					4.3.1-A3	New	☐	☐
5	Roof	2,752	(N)	0.031	R-30					4.2.1-A20	New	☐	☐
6	Slab	2,752	(N)	0.730	None					4.4.7-A1	New	☐	☐
7	Wall	104	(N)	0.102	R-13					4.3.1-A3	New	☐	☐
8	Wall	202	(E)	0.102	R-13					4.3.1-A3	New	☐	☐
9	Wall	98	(S)	0.102	R-13					4.3.1-A3	New	☐	☐
10	Roof	717	(N)	0.031	R-30					4.2.1-A20	New	☐	☐

1. See Instructions in the Nonresidential Compliance Manual, page 3-96.
2. If Fail, then describe on Page 2 of the Inspection Checklist Form and take appropriate action to correct. A fail does not meet compliance.

FENESTRATION SURFACE DETAILS

Tag/ID	Fenestration Type	Area (ft²)	Orientation N, E, S, W	Max U-Factor	U-Factor Source	Max (R)SHGC	SHGC Source	Overhang	Conditions Status	Pass	Fail²
1	Window	776	(N)	0.390	NFRC	0.370	NFRC	☐	New	☐	☐
2	Window	783	(S)	0.390	NFRC	0.370	NFRC	☐	New	☐	☐
3	Window	198	(E)	0.390	NFRC	0.370	NFRC	☐	New	☐	☐
4	Window	166	(W)	0.390	NFRC	0.370	NFRC	☐	New	☐	☐
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1. See Instructions in the Nonresidential Compliance Manual, page 3-96.
2. If Fail then describe on Page 2 of the Inspection Checklist Form and take appropriate action to correct. Verify building plans if necessary.

CERTIFICATE OF COMPLIANCE AND FIELD INSPECTION ENERGY CHECKLIST (Part 1 of 3) ENV-1C

Project Name: *Rancho Shopping Center C* | Date: *3/10/2012*
Project Address: *9606 Foothill Blvd. Rancho Cucamonga* | Climate Zone: *10* | Total Cond. Floor Area: *4,935* | Addition Floor Area: *n/a*

GENERAL INFORMATION

Building Type: ☒ Nonresidential ☐ High-Rise Residential ☐ Hotel/Motel Guest Room
☐ Schools (Public School) ☐ Relocatable Public School Bldg. ☒ Conditioned Spaces ☐ Unconditioned Spaces
☐ Skylight Area for Large Enclosed Space ≥ 8000 ft² (If checked include the ENV-4C with submittal)
Phase of Construction: ☒ New Construction ☐ Addition ☐ Alteration
Approach of Compliance: ☐ Component ☒ Overall Envelope ☐ Unconditioned (file affidavit)
Front Orientation: N, E, S, W or in Degrees: 0 deg

FIELD INSPECTION ENERGY CHECKLIST

OPAQUE SURFACE DETAILS

Tag/ID	Assembly Type	Area (ft²)	Orientation N, E, S, W	U-Factor	Cavity R-Value	Exterior R-Value	Exterior Furring³	Interior R-Value	Interior Furring³	Joint Appendix 4	Condition Status	Pass	Fail²
11	Slab	717	(N)	0.730	None					4.4.7-A1	New	☐	☐
12	Wall	114	(N)	0.102	R-13					4.3.1-A3	New	☐	☐
13	Wall	108	(S)	0.102	R-13					4.3.1-A3	New	☐	☐
14	Wall	184	(W)	0.102	R-13					4.3.1-A3	New	☐	☐
15	Roof	660	(N)	0.031	R-30					4.2.1-A20	New	☐	☐
16	Slab	660	(N)	0.730	None					4.4.7-A1	New	☐	☐
17	Wall	50	(N)	0.102	R-13					4.3.1-A3	New	☐	☐
18	Wall	55	(S)	0.102	R-13					4.3.1-A3	New	☐	☐
19	Roof	806	(N)	0.031	R-30					4.2.1-A20	New	☐	☐
20	Slab	806	(N)	0.730	None					4.4.7-A1	New	☐	☐

1. See Instructions in the Nonresidential Compliance Manual, page 3-96.
2. If Fail, then describe on Page 2 of the Inspection Checklist Form and take appropriate action to correct. A fail does not meet compliance.

FENESTRATION SURFACE DETAILS

Tag/ID	Fenestration Type	Area (ft²)	Orientation N, E, S, W	Max U-Factor	U-Factor Source	Max (R)SHGC	SHGC Source	Overhang	Conditions Status	Pass	Fail²
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1. See Instructions in the Nonresidential Compliance Manual, page 3-96.
2. If Fail then describe on Page 2 of the Inspection Checklist Form and take appropriate action to correct. Verify building plans if necessary.

CERTIFICATE OF COMPLIANCE AND FIELD INSPECTION ENERGY CHECKLIST (Part 3 of 3) ENV-1C

Project Name: *Rancho Shopping Center C* | Date: *3/10/2012*

Required Acceptance Tests

Designer:
This form is to be used by the designer and attached to the plans. Listed below is the acceptance test for Envelope Fenestrations system. The designer is required to check the acceptance tests and list all the fenestration products that require an acceptance test. If all the site-built fenestration of a certain type requires a test, list the different fenestration products and the number of systems. The NA7 Section in the Appendix of the Nonresidential Reference Appendices Manual describes the test. Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

Enforcement Agency:
Systems Acceptance. Before Occupancy Permit is granted for a newly constructed building or space or whenever new fenestration is installed in the building or space shall be certified as meeting the Acceptance Requirements. The ENV-2A form is not considered a complete form and is not to be accepted by the enforcement agency unless the boxes are checked and/or filled and signed. In addition, a Certificate of Acceptance forms shall be submitted to the enforcement agency that certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of §10-103(b) of Title 24 Part 6. The field inspector must receive the properly filled out and signed forms before the building can receive final occupancy. A copy of the ENV-2A for each different fenestration product line must be provided to the owner of the building for their records.

Test Description: Fenestration Products Name or ID Requiring Testing or Verification	Area of like Products	ENV-2A: Building Envelope Acceptance Test	Test Performed By:
Milgard Classic Low-E Vinyl	1,923	☒	
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CERTIFICATE OF COMPLIANCE and FIELD INSPECTION ENERGY CHECKLIST (Part 3 of 4) MECH-1C

Project Name: *Rancho Shopping Center C* | Date: *3/10/2012*

Required Acceptance Tests

Designer:
This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for mechanical systems. The designer is required to check the applicable boxes by all acceptance tests that apply and listed all equipment that requires an acceptance test. If all equipment of a certain type requires a test, list the equipment description and the number of systems. The NA number designates the Section in the Appendix of the Nonresidential Reference Appendices Manual that describes the test. Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

Building Departments:
Systems Acceptance: Before occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all control devices serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance.
Systems Acceptance: Before occupancy permit is granted. All newly installed HVAC equipment must be tested using the Acceptance Requirements.

The MECH-1C form is not considered a completed form and is not to be accepted by the building department unless the correct boxes are checked. The equipment requiring testing, person performing the test (Example: HVAC installer, TAB contractor, controls contractor, PE in charge of project) and what Acceptance test must be conducted. The following checked-off forms are required for **ALL** newly installed equipment. In addition a Certificate of Acceptance forms shall be submitted to the building department that certifies plans, specifications, installation, certificates, and operating and maintenance information meet the requirements of §10-103(b) and Title-24 Part 6. The building inspector must receive the properly filled out and signed forms before the building can receive final occupancy.

TEST DESCRIPTION: Equipment Requiring Testing or Verification	Qty.	MECH-2A Outdoor Ventilation For VAV & CAV	MECH-3A Constant Volume & Single-Zone Unitary	MECH-4A Air Distribution Ducts	MECH-5A Economizer Controls	MECH-6A Demand Control Ventilation DCV	MECH-7A Supply Fan VAV	MECH-8A Valve Leakage Test	MECH-9A Supply Water Temp. Reset	MECH-10A Hydronic System Variable Flow Control	MECH-11A Automatic Demand Shed Control
Carrier 50EZ03030	4	☐	☒	☐	☐	☐	☐	☐	☐	☐	☒
Carrier 50HJQ004	3	☐	☒	☐	☒	☒	☐	☐	☐	☐	☒
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CERTIFICATE OF COMPLIANCE and FIELD INSPECTION ENERGY CHECKLIST (Part 4 of 4) MECH-1C

Project Name: *Rancho Shopping Center C* | Date: *3/10/2012*

TEST DESCRIPTION: Equipment Requiring Testing	Qty.	MECH-12A Fault Detection & Diagnostics for DX Units	MECH-13A Automatic Fault Detection & Diagnostics for Air & Zone	MECH-14A Distributed Energy Storage DX AC Systems	MECH-15A Thermal Energy Storage (TES) Systems	Test Performed By:
Carrier 50EZ03030	4	☐	☐	☐	☐	MECH. CONT.
Carrier 50HJQ004	3	☐	☐	☐	☐	MECH. CONT.
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MECHANICAL VENTILATION AND REHEAT MECH-3C

Project Name: *Rancho Shopping Center C* | Date: *3/10/2012*

MECHANICAL VENTILATION (§121(b)2) — AREA BASIS / OCCUPANCY BASIS; REHEAT LIMITATION (§144(d)) — VAV MINIMUM

A Zone/System	B Condition Area (ft²)	C CFM per ft²	D Min CFM By Area B X C	E Number Of People	F CFM per Person	G Min CFM by Occupant E X F	H REQ'D V.A. Max of D or G	I Design Ventilation Air CFM	J 50% of Design Zone Supply CFM	K B X 0.4 CFM / ft²	L Max. of Columns H, J, K, 300 CFM	M Design Minimum Air Setpoint	N Transfer Air
Retail Zone	2,752	0.25	688				688	688					
Inside Mech. System						Total	688	688					
Retail Zone	717	0.25	179				179	179					
East Mech. System						Total	179	179					
Retail Zone	660	0.25	165				165	165					
West Mech. System						Total	165	165					
Retail Zone	806	0.25	202				202	202					
Middle Mech. System						Total	202	202					
					Totals				Column I Total Design Ventilation Air				

C	Minimum ventilation rate per Section §121, Table 121-A.
E	Based on fixed seat or the greater of the expected number of occupants and 50% of the CBC occupant load for egress purposes for spaces without fixed seating.
H	Required Ventilation Air (REQ'D V.A.) is the larger of the ventilation rates calculated on an AREA BASIS or OCCUPANCY BASIS (Column D or G).
I	Must be greater than or equal to H, or use Transfer Air (column N) to make up the difference.
J	Design fan supply CFM (Fan CFM) x 50%; or the design zone outdoor airflow rate per §121.
K	Condition area (ft²) x 0.4 CFM / ft²; or
L	Maximum of Columns H, J, K, or 300 CFM
M	This must be less than or equal to Column L and greater than or equal to the sum of Columns H plus N.
N	Transfer Air must be provided where the Required Ventilation Air (Column H) is greater than the Design Minimum Air (Column M). Where required, transfer air must be greater than or equal to the difference between the Required Ventilation Air (Column H) and the Design Minimum Air (Column M), Column H minus M.

REVISIONS | DATE

DEVELOPER: CALIFORNIA LIBERTY INVESTMENTS
537 CERES AVE
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PROJECT NO: 120102
CAD DWG FILE:
DRAWN BY : M.M.
CHECKED BY: G.B.
SCALE: NOTED
DATE : 04-08-12
SHEET TITLE:

T-24
FORMS

SHEET
M-6
7 OF 7