



COMcheck Software Version 3.4.0

Mechanical Compliance Certificate

2006 IECC

Report Date: 07/02/07

Data filename: C:\DOCUMENTS\John\LOCALS-1\TEMPOR-1\OLKA\2006IE-1.CCK

Section 1: Project Information

Project Title: City of Las Vegas #48

Construction Site:
Las Vegas, NV

Owner/Agent:

Designer/Contractor:
Samuel Tolman
City Of Las Vegas Architectural Services
Las Vegas, NV

Section 2: General Information

Building Location (for weather data): Las Vegas, Nevada
Climate Zone: 3b
Heating Degree Days (base 65 degrees F): 2682
Cooling Degree Days (base 50 degrees F): 6091
Project Type: New Construction

Section 3: Mechanical Systems List

Quantity	System Type & Description
5	HVAC System 1: Heating: Other, Gas / Cooling: Rooftop Package Unit, Capacity >=54 kBtu/h, Air-Cooled Condenser / Single Zone
2	HVAC System 2: Heating: Other, Gas / Cooling: Rooftop Package Unit, Capacity >=54 - <90 kBtu/h, Air-Cooled Condenser / Single Zone
4	HVAC System 3: Heating: Unit Heater, Gas
1	Storage Water Heater 2: Gas Storage Water Heater, Capacity: 100 gallons, Input Rating: 199999 Btu/h w/ Circulation Pump

Section 4: Requirements Checklist

Requirements Specific To: HVAC System 1:

- ☐ 1. Equipment minimum efficiency: Rooftop Package Unit: 10.1 EER

Requirements Specific To: HVAC System 2:

- ☐ 1. Equipment minimum efficiency: Rooftop Package Unit: 10.1 EER
- ☐ 2. Cooling system provides a means to relieve excess outdoor air during economizer operation.
- ☐ 3. Integrated air economizer required

Requirements Specific To: HVAC System 3:

- ☐ 1. Equipment minimum efficiency: Unit Heater (Gas): 80% Ec

Requirements Specific To: Storage Water Heater 2:

- ☐ 1. Hot water system sized per manufacturer's sizing guide
- ☐ 2. Gas Storage Water Heater efficiency >= 80% Ef, 260 SL, Btu/h
- ☐ 3. All piping in circulating system insulated
- ☐ 4. Hot water storage temperature adjustable down to 120 degrees F or lower
- ☐ 5. Automatic time control of heat tapes and recirculating systems present
- ☐ 6. Controls will shut off operation of circulating pump between water heater/boiler and storage tanks within 5 minutes after end of heating cycle

Generic Requirements: Must be met by all systems to which the requirement is applicable:

- ☐ 1. Load calculations per 2001 ASHRAE Fundamentals
- ☐ 2. Plant equipment and system capacity no greater than needed to meet loads
Exception: Standby equipment automatically off when primary system is operating
Exception: Multiple units controlled to sequence operation as a function of load
- ☐ 3. Minimum one temperature control device per system
- ☐ 4. Minimum one humidity control device per installed humidification/dehumidification system
- ☐ 5. Thermostatic controls has 5 degrees F deadband
Exception: Thermostats requiring manual changeover between heating and cooling
- ☐ 6. Automatic Controls: Setback to 55 degrees F (heat) and 85 degrees F (cool); 7-day clock, 2-hour occupant override, 10-hour backup
Exception: Continuously operating zones
Exception: 2 kW demand or less, submit calculations
- ☐ 7. Outside-air source for ventilation; system capable of reducing OSA to required minimum
- ☐ 8. R-5 supply and return air duct insulation in unconditioned spaces R-8 supply and return air duct insulation outside the building R-8 insulation between ducts and the building exterior when ducts are part of a building assembly
Exception: Ducts located within equipment
Exception: Ducts with interior and exterior temperature difference not exceeding 15 degrees F
Exception: Continuously welded and locking-type longitudinal joints and seams on ducts operating at static pressures less than 2 inches w.g. pressure classification
- ☐ 9. Mechanical fasteners and sealants used to connect ducts and air distribution equipment
- ☐ 10. Ducts sealed - longitudinal seams on rigid ducts; transverse seams on all ducts; UL 181A or 181B tapes and mastics
- ☐ 11. Hot water pipe insulation: 1 in. for pipes <=1.5 in. and 2 in. for pipes >1.5 in. Chilled water/refrigerant/brine pipe insulation: 1 in. for pipes <=1.5 in. and 1.5 in. for pipes >1.5 in. Steam pipe insulation: 1.5 in. for pipes <=1.5 in. and 3 in. for pipes >1.5 in.
Exception: Piping within HVAC equipment
Exception: Fluid temperatures between 55 and 105 degrees F
Exception: Fluid not heated or cooled
Exception: Runouts <4 ft in length
- ☐ 12. Operation and maintenance manual provided to building owner
- ☐ 13. Balancing devices provided in accordance with IMC 603.15
- ☐ 14. Piping, insulated to 1/2 in. if nominal diameter of pipe is <1.5 in.; Larger pipe insulated to 1 in. thickness
- ☐ 15. Lavatory faucet outlet temperatures in public restrooms limited to 110 degrees F (43 degrees C)
- ☐ 16. Motorized, automatic shutoff dampers required on exhaust and outdoor air supply openings
Exception: Gravity dampers acceptable in buildings <3 stories
Exception: Gravity dampers acceptable in systems with outside or exhaust air flow rates less than 300 cfm where dampers are interlocked with fan
- ☐ 17. Stair and elevator shaft vents are equipped with motorized dampers

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2006 IECC requirements in COMcheck Version 3.4.0 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title Signature Date



COMcheck Software Version 3.4.0

Mechanical Requirements Description

2006 IECC

Report Date:

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The following list provides more detailed descriptions of the requirements in Section 4 of the Mechanical Compliance Certificate.

Requirements Specific To: HVAC System 1:

- 1. The specified heating and/or cooling equipment is covered by ASHRAE 90.1 Code and must meet the following minimum efficiency: Rooftop Package Unit: 10.1 EER

Requirements Specific To: HVAC System 2:

- 1. The specified heating and/or cooling equipment is covered by ASHRAE 90.1 Code and must meet the following minimum efficiency: Rooftop Package Unit: 10.1 EER
- 2. Cooling system provides a means to relieve excess outdoor air during economizer operation to prevent overpressurizing the building.
- 3. An integrated air economizer is required for individual cooling systems over 65 kBtu/h in the selected climate. An integrated economizer allows simultaneous operation of outdoor-air and mechanical cooling.

Requirements Specific To: HVAC System 3:

- 1. The specified heating and/or cooling equipment is covered by the ASHRAE 90.1 Code and must meet the following minimum efficiency: Unit Heater (Gas): 80% Ec

Requirements Specific To: Storage Water Heater 2:

- 1. Service water heating system design loads for the purpose of sizing systems and equipment must be determined in accordance with manufacturers' published sizing guidelines.
- 2. Service water heating equipment used solely for heating potable water, pool heaters, and hot water storage tanks must meet the following minimum efficiency: Gas Storage Water Heater efficiency >= 80% Ef, 260 SL, Btu/h
- 3. Insulation must be provided for recirculating system piping, including the supply and return piping of a circulating tank type water heater.
- 4. Temperature controls must be provided that allow for storage temperature adjustment from 120 degrees F or lower to a maximum temperature compatible with the intended use except when the manufacturer's installation instructions specify a higher minimum thermostat setting to minimize condensation and resulting corrosion. Documentation of the installation instructions must be provided to be exempted from this requirement.
- 5. Systems designed to maintain usage temperatures in hot water pipes, such as recirculating hot water systems or heat trace, must be equipped with automatic time switches or other controls that can be set to switch off the temperature maintenance system during extended periods when hot water is not required.
- 6. When used to maintain storage tank water temperature, recirculating pumps must be equipped with controls limiting operation to the start of the heating cycle to a maximum of 5 minutes after the end of the heating cycle.

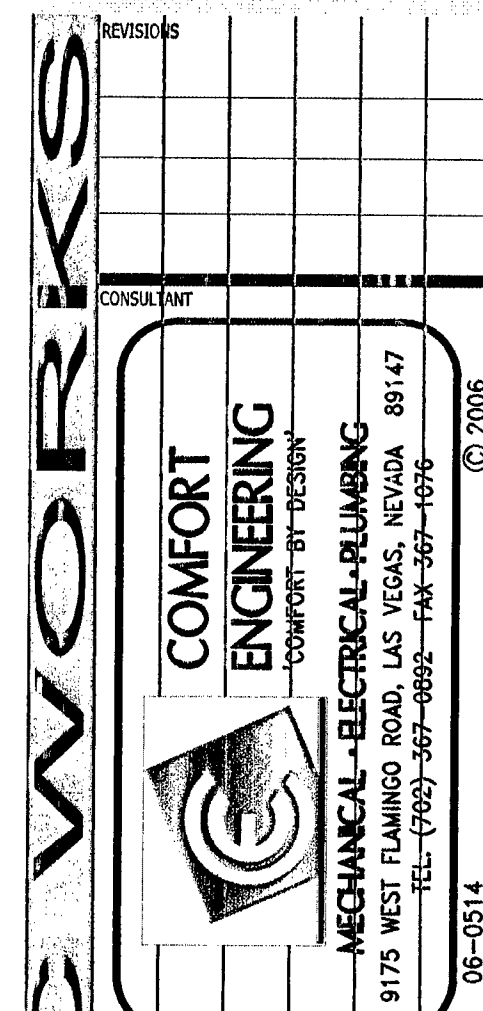
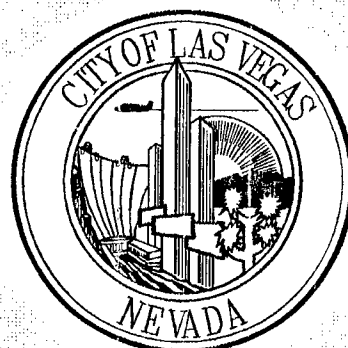
Generic Requirements: Must be met by all systems to which the requirement is applicable:

- 1. Design heating and cooling loads for the building must be determined using procedures in the ASHRAE Handbook of Fundamentals or an approved equivalent calculation procedure.
- 2. All equipment and systems must be sized to be no greater than needed to meet calculated loads. A single piece of equipment providing both heating and cooling must satisfy this provision for one function with the capacity for the other function as small as possible, within available equipment options.
Exception: The equipment and/or system capacity may be greater than calculated loads for standby purposes. Standby equipment must be automatically controlled to be off when the primary equipment and/or system is operating.
Exception: Multiple units of the same equipment type whose combined capacities exceed the calculated load are allowed if they are provided with controls to sequence operation of the units as the load increases or decreases.
- 3. Each heating or cooling system serving a single zone must have its own temperature control device.
- 4. Each humidification system must have its own humidity control device.
- 5. Thermostats controlling both heating and cooling must be capable of maintaining a 5 degrees F deadband (a range of temperature where no heating or cooling is provided).
Exception: Deadband capability is not required if the thermostat does not have automatic changeover capability between heating and cooling.
- 6. The system or zone control must be a programmable thermostat or other automatic control meeting the following criteria: a) capable of setting back temperature to 55 degrees F during heating and setting up to 85 degrees F during cooling; b) capable of automatically setting back or shutting down systems during unoccupied hours using 7 different day schedules; c) have an accessible 2-hour occupant override; have a battery back-up capable of maintaining programmed settings for at least 10 hours without power.
Exception: A setback or shutoff control is not required on thermostats that control systems serving areas that operate continuously.
Exception: A setback or shutoff control is not required on systems with total energy demand of 2 kW (8,226 Btu/h) or less.
- 7. The system must supply outside ventilation air as required by Chapter 4 of the International Mechanical Code. If the ventilation system is designed to supply outdoor-air quantities exceeding minimum required levels, the system must be capable of reducing outdoor-air flow to the minimum required levels.
- 8. Air ducts must be insulated to the following levels: a) Supply and return air ducts for conditioned air located in unconditioned spaces (spaces neither heated nor cooled) must be insulated with a minimum of R-8. Unconditioned spaces include attics, crawl spaces, unheated basements, and unheated garages. b) Supply and return air ducts and plenums must be insulated to a minimum of R-8 when located outside the building. c) When ducts are located within exterior compartments (e.g., floors or roofs), minimum R-8 insulation is required only between the duct and the building exterior.
Exception: Duct insulation is not required on ducts located within equipment.
Exception: Duct insulation is not required when the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15 degrees F.
Exception: Continuously welded and locking-type longitudinal joints and seams on ducts operating at static pressures less than 2 inches w.g. pressure classification.
- 9. Mechanical fasteners and seals, mastics, or gaskets must be used when connecting ducts to fans and other air distribution equipment, including multiple-zone terminal units.
- 10. All joints, longitudinal and transverse seams, and connections in ductwork must be securely sealed using weldments; mechanical fasteners with seals, gaskets, or mastics; mesh and mastic sealing systems; or tapes. Tapes and mastics must be listed and labeled in accordance with UL 181A and shall be marked "181A-P" for pressure sensitive tape, "181A-M" for mastic or "181A-H" for heat-sensitive tape. Tapes and mastics used to seal flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181B-FX" for pressure-sensitive tape or "181B-M" for mastic. Unlisted duct tape is not permitted as a sealant on any metal ducts.
- 11. All pipes serving space-conditioning systems must be insulated as follows: Hot water piping for heating systems: 1 in. for pipes <=1 1/2-in. nominal diameter 2 in. for pipes >1 1/2-in. nominal diameter. Chilled water, refrigerant, and brine piping systems: 1 in. insulation for pipes <=1 1/2-in. nominal diameter 1 1/2 in. insulation for pipes >1 1/2-in. nominal diameter. Steam piping: 1 1/2 in. insulation for pipes <=1 1/2-in. nominal diameter 3 in. insulation for pipes >1 1/2-in. nominal diameter.
Exception: Pipe insulation is not required for factory-installed piping within HVAC equipment.
Exception: Pipe insulation is not required for piping that conveys fluids having a design operating temperature range between 55 degrees F and 105 degrees F.
Exception: Pipe insulation is not required for piping that conveys fluids that have not been heated or cooled through the use of fossil fuels or electric power.
Exception: Pipe insulation is not required for runout piping not exceeding 4 ft in length and 1 in. in diameter between the control valve and HVAC coil.
- 12. Operation and maintenance documentation must be provided to the owner that includes at least the following information: a) equipment capacity (input and output) and required maintenance actions; b) equipment operation and maintenance manuals; c) HVAC system control maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions; desired or field-determined set points must be permanently recorded on control drawings, at control devices, or, for digital control systems, in programming comments; d) complete narrative of how each system is intended to operate.
- 13. Each supply air outlet or diffuser and each zone terminal device (such as VAV or mixing box) must have its own balancing device. Acceptable balancing devices include adjustable dampers located within the ductwork, terminal devices, and supply air diffusers.
- 14. Service hot water piping, where required, must be insulated to 1/2 in. if pipe less than 1.5 in. nominal diameter. Larger pipe must be insulated to 1 in. Pipe insulation will have a conductivity of less than 0.28 Btu.in/(h-ft2-degrees F).
- 15. Temperature controlling means must be provided to limit the maximum temperature of water delivered from lavatory faucets in public facility restrooms to 110 degrees F.
- 16. Outdoor air supply and exhaust systems must have motorized dampers that automatically shut when the systems or spaces served are not in use. Dampers must be capable of automatically shutting off during preoccupancy building warm-up, cool-down, and setback, except when ventilation reduces energy costs (e.g., night purge) or when ventilation must be supplied to meet code requirements. Both outdoor air supply and exhaust air dampers must have a maximum leakage rate of 3 cfm/ft2 at 1.0 in. w.g. when tested in accordance with AMCA Standard 500.
Exception: Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height.
Exception: Systems with a design outside air intake or exhaust capacity of 300 cfm (140 L/s) or less that are equipped with motor-operated dampers that open and close when the unit is energized and de-energized, respectively.
- 17. Stair and elevator shaft vents must be equipped with motorized dampers capable of being automatically closed during normal building operation and interlocked to open as required by fire and smoke detection systems. All gravity outdoor air supply and exhaust hoods, vents, and ventilators must be equipped with motorized dampers that will automatically shut when the spaces served are not in use. Exceptions: - Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height above grade. - Ventilation systems serving unconditioned spaces.

PLANS APPROVED
PLUMBING/MECHANICAL
Building & Safety Dept.
City of Las Vegas, Nevada

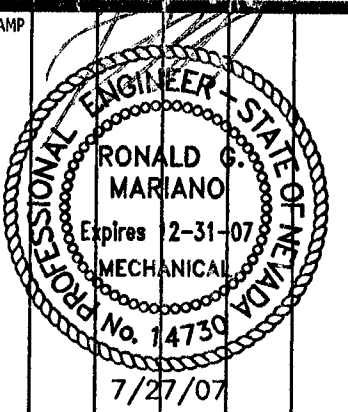
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Does Not Include Architectural, Electrical
Structural or Off-Site
Improvements Made Via Change
Without Approval Plan Is
Not a Permit to Violate Any Ordinance



CITY OF LAS VEGAS, NEVADA
FIRE STATION #48

ENERGY SCHEDULES



OWNER: CITY OF LAS VEGAS
DEPARTMENT OF PUBLIC WORKS
ARCHITECTURAL SERVICES

ARCHITECT OF RECORD
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DRAWN: DBB
FILE: 06-054
DATE: 07/07/07
SCALE: AS NOTED
DIB NO:
CLV DWG NO:
SHT NO:

M1.2