



COMcheck Software Version 4.0.5.1

Mechanical Compliance Certificate

Section 1: Project Information

Energy Code: 2014 Oregon Energy Efficiency Specialty Code
Project Title: FOREST GROVE SENIOR CENTER
Project Type: Alteration

Construction Site:
2037 DOUGLAS STREET
FOREST GROVE, OR 97116

Owner/Agent:
CITY OF FOREST GROVE
FOREST GROVE, OR

Designer/Contractor:
ALLEN CRISANAZ
MKE and Associates
6915 SW Macadam Avenue
Portland, OR 97219
503-892-1188

Section 2: General Information

Building Location (for weather data): Forest Grove, Oregon
Climate Zone: 4c

Section 3: Mechanical Systems List

Quantity System Type & Description

- 1 DH-1 (Single Zone) :
Heating: 1 each - Duct Furnace, Gas, Capacity = 225 kBtu/h
Proposed Efficiency = 80.00% Ec, Required Efficiency = 80.00% Ec
Fan System: SF-1 | KITCHEN MAKEUP AIR -- Compliance (Motor nameplate HP method) : Passes
- Fans:
FAN 1 Supply, Constant Volume, 3200 CFM, 1.5 motor nameplate hp

Section 4: Requirements Checklist

In the following requirements, blank checkboxes identify requirements that the applicant has not acknowledged as being met. Checkmarks identify requirements that the applicant acknowledges are met or excepted from compliance. 'Plans reference page/section' identifies where in the plans/specs the requirement can be verified as being satisfied.

Requirements Specific To: DH-1 :

1. Equipment meets minimum efficiency: Duct Furnace (Gas): 80.00 % Ec
 2. Energy recovery ventilation systems. Individual fan systems that have both a design supply air capacity of 5,000 cfm or greater and a minimum outside air supply of 70 percent or greater of the design supply air quantity have an energy recovery system.

Exception(s):

- Where energy recovery systems are prohibited by the International Mechanical Code.
- Systems serving spaces that are not cooled and are heated to less than 60°F.
- Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy.
- Type 1 kitchen exhaust hoods.
- Cooling systems in climates with a 1-percent cooling design wet-bulb temperature less than 64°F (18°C).
- Systems requiring dehumidification that employ series-style energy recovery coils wrapped around the cooling coil when the evaporative coil is located upstream of the exhaust air stream.
- Systems exhausting toxic, flammable, paint exhaust, corrosive fumes, or dust.
- Laboratory fume hood systems that include qualifying features.

Plans reference page/section: Not applicable

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

1. Calculation of heating and cooling loads. Design loads are determined in accordance with the procedures described in the ASHRAE/ACCA Standard 183. Alternatively, design loads have been determined by an approved equivalent computation procedure.
2. Packaged Electric Equipment. Specified packaged electrical equipment has a heat pump as the primary heating source.
Exception(s):
 Unstaffed equipment shelters or cabinets used solely for personal wireless service facilities.
 Requirement is not applicable.
Plans reference page/section: _____
3. Equipment and system sizing. Heating and cooling equipment and systems capacity do not exceed the loads calculated in accordance with Section 503.2.1.
Exception(s):
 Required standby equipment and systems provided with controls and devices that allow such systems or equipment to operate automatically only when the primary equipment is not operating.
 Multiple units of the same equipment type with combined capacities exceeding the design load and provided with controls that have the capability to sequence the operation of each unit based on load.
Plans reference page/section: M1.0
4. HVAC Equipment Performance Requirements. Reported efficiencies have been tested and rated in accordance with the applicable test procedure. The efficiency has been verified through certification under an approved certification program or, if no certification program exists, the equipment efficiency ratings are supported by data furnished by the manufacturer.
5. Thermostatic Controls. The supply of heating and cooling energy to each zone is controlled by individual thermostatic controls that respond to temperature within the zone.
Plans reference page/section: Section 23 55 33
6. Set point overlap restriction. Where used to control both heating and cooling, zone thermostatic controls provide a temperature range or deadband of at least 5°F (2.8°C) within which the supply of heating and cooling energy to the zone is capable of being shut off or reduced to a minimum.
Exception(s):
 Thermostats requiring manual change over between heating and cooling modes.
Plans reference page/section: Not applicable
7. Optimum Start Controls. Each HVAC system has controls that vary the start-up time of the system to just meet the temperature set point at time of occupancy.
Plans reference page/section: Not applicable
8. Off-hour controls. Each zone is provided with thermostatic setback controls that are controlled by either an automatic time clock or programmable control system.
Exception(s):
 Zones that will be operated continuously.
 Zones with a full HVAC load demand not exceeding 6,800 Btu/h (2 kW) and having a readily accessible manual shutoff switch.
Plans reference page/section: Not applicable
9. Shutoff damper controls. Both outdoor air supply and exhaust are equipped with not less than Class I motorized dampers.
Exception(s):
 Gravity dampers shall be permitted for outside air intake or exhaust airflows of 300 cfm or less.
Plans reference page/section: Sheet M1.0
10. Freeze Protection and Snow melt system controls. Freeze protection systems, such as heat tracing of outdoor piping and heat exchangers, including self-regulating heat tracing, include automatic controls capable of shutting off the systems when outdoor air temperatures meet code criteria.
Plans reference page/section: Not applicable
11. Separate air distribution systems. Zones with special process temperature requirements and/or humidity requirements are served by separate air distribution systems from those serving zones requiring only comfort conditions; or shall include supplementary control provisions so that the primary systems may be specifically controlled for comfort purposes only.
Exception(s):
 [503.2.4.8 +] Zones requiring only comfort heating or comfort cooling that are served by a system primarily used for process temperature and humidity control.
Plans reference page/section: Not applicable

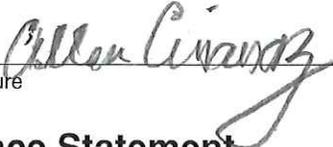
12. Humidity control. If a system is equipped with a means to add or remove moisture to maintain specific humidity levels in a zone or zones, a humidity control device is provided.
Plans reference page/section: Not applicable
13. Humidity control. Where a humidity control device exists it is set to prevent the use of fossil fuel or electricity to produce relative humidity in excess of 30 percent. Where a humidity control device is used for dehumidification, it is set to prevent the use of fossil fuel or electricity to reduce relative humidity below 60 percent.
Exception(s):
 Hospitals, process needs, archives, museums, critical equipment, and other non-comfort situations with specific humidity requirements outside this range.
Plans reference page/section: Not applicable
14. Humidity control. Where a humidity control device exists it is set to maintain a deadband of at least 10% relative humidity where no active humidification or dehumidification takes place.
Exception(s):
 Heating for dehumidification is provided with heat recovery or heat pumping and the mechanical cooling system efficiency is 10 percent higher than required in section 503.2.3, HVAC equipment performance requirements.
Plans reference page/section: Not applicable
15. Ventilation. Ventilation, either natural or mechanical, is provided in accordance with Chapter 4 of the International Mechanical Code. Where mechanical ventilation is provided, the system has the capability to reduce the outdoor air supply to the minimum required by Chapter 4 of the International Mechanical Code.
Plans reference page/section: Not applicable
16. Demand controlled ventilation (DCV). DCV is required for spaces larger than 500 ft² for simple systems and spaces larger than 150 ft² for multiple zone systems.
Exception(s):
 Systems with energy recovery complying with Section 503.2.6
 Spaces less than 750 ft² (69.7 m²) where an occupancy sensor turns the fan off, closes the ventilation damper, or closes the zone damper when the space is unoccupied.
Plans reference page/section: Not applicable
17. Kitchen hoods. Kitchen makeup is provided as required by the Oregon Mechanical Specialty Code.
Exception(s):
 Where hoods are used to exhaust ventilation air that would otherwise be exhausted by other fan systems.
 Kitchen exhaust systems that include exhaust air energy recovery complying with section 503.2.6.
Plans reference page/section: M1.0; 23 55 33
18. Enclosed parking garage ventilation controls. In Group S-2, enclosed parking garages used for storing or handling automobiles employs automatic carbon monoxide sensing devices.
Plans reference page/section: Not applicable
19. Duct and plenum insulation and sealing. All supply and return air ducts and plenums are insulated with the specified insulation. When located within a building envelope assembly, the duct or plenum is separated from the building exterior or unconditioned or exempt spaces by a minimum of R-8 insulation. All ducts, air handlers and filter boxes are sealed. Joints and seams comply with Section 603.9 of the International Mechanical Code.
Exception(s):
 When located within equipment.
 When the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C).
20. Low-pressure duct systems. All longitudinal and transverse joints, seams and connections of low-pressure supply and return ducts are securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems or tapes installed in accordance with the manufacturer's installation instructions.
Exception(s):
 Continuously welded and locking-type longitudinal joints and seams on ducts operating at static pressures less than 2 inches w.g. pressure classification.
Plans reference page/section: M1.0
21. Medium-pressure duct systems. All ducts and plenums designed to operate medium-pressure are insulated and sealed in accordance with Section 503.2.7. Pressure classifications specific to the duct system are clearly indicated on the construction documents.
Plans reference page/section: Not applicable

22. High-pressure duct systems. Ducts designed to operate at high-pressure are insulated and sealed in accordance with Section 503.2.7. In addition, ducts and plenums are leak-tested in accordance with the SMACNA HVAC Air Duct Leakage Test Manual.
Plans reference page/section: Not applicable
23. Air system balancing. Each supply air outlet and zone terminal device is equipped with means for air balancing in accordance with the requirements of IMC 603.17. Discharge dampers intended to modulate airflow are prohibited on constant volume fans and variable volume fans with motors 10 horsepower.
Plans reference page/section: 23 33 00
24. Manuals. The construction documents require that an operating and maintenance manual be provided to the building owner by the mechanical contractor. See long description for specifications.
Plans reference page/section: 23 00 00
25. Air System Design and Control. Each HVAC system having a total fan system motor nameplate hp exceeding 5 hp meets the provisions of Sections 503.2.10.1 through 503.2.10.2.
Plans reference page/section: Not applicable
26. Allowable fan floor horsepower. Each HVAC system at fan system design conditions does not exceed the allowable fan system motor nameplate hp (Option 1) or fan system bhp (Option 2) as shown and calculated in requirement details.
Exception(s):
 Hospital and laboratory systems that utilize flow control devices on exhaust and/or return to maintain space pressure relationships necessary for occupant health and safety or environmental control shall be permitted to use variable volume fan power limitation.
 Individual exhaust fans with motor nameplate horsepower of 1 hp or less.
Plans reference page/section: M1 . 0
27. Motor nameplate horsepower. For each fan, the selected fan motor is no larger than the first available motor size greater than the brake horsepower (bhp).
Exception(s):
 For fans less than 6 bhp, where the first available motor larger than the brake horsepower has a nameplate rating within 50 percent of the bhp, selection of the next larger nameplate motor size is allowed.
 For fans 6 bhp and larger, where the first available motor larger than the bhp has a nameplate rating within 30 percent of the bhp, selection of the next larger nameplate motor size is allowed.
Plans reference page/section: M1 . 0
28. Large Volume Fan Systems. Fan systems over 8,000 (7 m3/s) cfm without direct expansion cooling coils that serve single zones reduce airflow based on space thermostat heating and cooling demand. A two-speed motor or variable frequency drive reduces airflow to a maximum 60 percent of peak airflow or minimum ventilation air requirement as required by Chapter 4 of the International Mechanical Code, whichever is greater.
Exception(s):
 Systems where the function of the supply air is for purposes other than temperature control, such as maintaining specific humidity levels or supplying an exhaust system.
Plans reference page/section: Not applicable
29. All air-conditioning equipment and air-handling units with direct expansion cooling and a cooling capacity at ARI conditions greater than or equal to 110,000 Btu/h that serve single zones have their supply fan operation controlled according to code specific requirements.
Exception(s):
 Systems where the function of the supply air is for purposes other than temperature control, such as maintaining specific humidity levels or supplying an exhaust system.
Plans reference page/section: Not applicable

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical alteration project has been designed to meet the 2014 Oregon Energy Efficiency Specialty Code, Chapter 8, requirements in COMcheck Version 4.0.5.1 and to comply with the mandatory requirements in the Requirements Checklist.

Allen Crisanaz-Mechanical Engineer
Name - Title


Signature

5/15/17
Date

Section 6: Post Construction Compliance Statement

- HVAC record drawings of the actual installation, system capacities, calibration information, and performance data for each equipment provided to the owner.
- HVAC O&M documents for all mechanical equipment and system provided to the owner by the mechanical contractor.
- Written HVAC balancing and operations report provided to the owner.

The above post construction requirements have been completed.

Principal Mechanical Designer-Name

Signature

Date