



# Envelope Compliance Certificate

## 90.1 (2004) Standard

Report Date: 02/27/08

Data filename: C:\Documents and Settings\Robert\Desktop\Masker Building 2-08\Masker Comcheck.cck

### Section 1: Project Information

Project Title: Office Renovation for Ray Masker

Construction Site:  
683 Old Spanish Trail  
Slidell, LA 70458

Owner/Agent:  
Ray Masker  
Slidell, LA  
504.616.4604

Designer/Contractor:  
Dammon Engineering, Inc.  
1095 Florida Avenue  
Slidell, LA 70458  
985.649.5832  
dammoneng@bellsouth.net

### Section 2: General Information

Building Location (for weather data): **Slidell, Louisiana**  
Heating Degree Days (base 65 degrees F): **1674**  
Cooling Degree Days (base 50 degrees F): **6660**  
Building Type for Envelope Requirements: **Non-Residential**  
Project Type: **New Construction**  
Vertical Glazing / Wall Area Pct.: **5%**

Activity Type(s)	Floor Area
Common Space Types:Office - Enclosed	2520
Warehouse:Medium/Bulky Material Storage	534

### Section 3: Requirements Checklist

**Envelope PASSES: Design 7% better than code.**

#### Climate-Specific Requirements:

Component Name/Description	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor
Roof 1: Metal Building, Screw Down	2656	10.0	19.0	0.039	0.065
Exterior Wall 1: Metal Building Wall	1964	11.0	10.0	0.055	0.113
Window 1: Metal Frame:Double Pane, Clear, Fixed, SHGC 0.87	60	---	---	0.550	1.220
Door 1: Glass, Clear, SHGC 0.87	48	---	---	1.050	1.220
Door 2: Insulated Metal, Swinging	40	---	---	1.000	0.700
Interior Wall 1: Steel-Framed, 16" o.c.	304	11.0	0.0	0.128	0.352
Floor 1: Slab-On-Grade:Unheated, Horizontal without vertical 1 ft.	196	---	1.0	---	---

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.

#### Insulation:

- 1. Open-blown or poured loose-fill insulation has not been used in attic roof spaces with ceiling slope greater than 3 in 12.
- 2. Wherever vents occur, they are baffled to deflect incoming air above the insulation.
- 3. Recessed lights, equipment and ducts are not affecting insulation thickness.
- 4. No roof insulation is installed on a suspended ceiling with removable ceiling panels.
- 5. All exterior insulation is covered with protective material.
- 6. Cargo and loading dock doors are equipped with weather seals.

**Fenestration and Doors:**

- 7. Windows and skylights are labeled and certified by the manufacturer for U-factor and SHGC.
- 8. Fixed windows and skylights unlabeled by the manufacturer have been site labeled using the default U-factor and SHGC.
- 9. Other unlabeled vertical fenestration, operable and fixed, that are unlabeled by the manufacturer have been site labeled using the default U-factor and SHGC. No credit has been given for metal frames with thermal breaks, low-emissivity coatings, gas fillings, or insulating spacers.

**Air Leakage and Component Certification:**

- 10. All joints and penetrations are caulked, gasketed, weather-stripped, or otherwise sealed.
- 11. Windows, doors, and skylights certified as meeting leakage requirements.
- 12. Component R-values & U-factors labeled as certified.
- 13. Insulation installed according to manufacturer's instructions, in substantial contact with the surface being insulated, and in a manner that achieves the rated R-value without compressing the insulation.

**Section 4: Compliance Statement**

*Compliance Statement:* The proposed envelope design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed envelope system has been designed to meet the 90.1 (2004) Standard requirements in COMcheck Version 3.4.1 and to comply with the mandatory requirements in the Requirements Checklist.

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Name - Title

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Signature

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Date



# Lighting and Power Compliance Certificate

## 90.1 (2004) Standard

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Slidell, LA 70458  
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dammoneng@bellsouth.net

### Section 2: General Information

Building Use Description by: **Activity Type**  
Project Type: **New Construction**

<u>Activity Type(s)</u>	<u>Floor Area</u>
Common Space Types:Office - Enclosed	2520
Warehouse:Medium/Bulky Material Storage	534

### Section 3: Requirements Checklist

#### Interior Lighting:

1. Total actual watts must be less than or equal to total allowed watts.

<b>Allowed Watts</b>	<b>Actual Watts</b>	<b>Complies</b>
3253	3212	YES

2. Exit signs 5 Watts or less per side.

#### Exterior Lighting:

3. Comply with Sections 9.4.4 and 9.4.5 of 90.1-2004 and attach documentation.

#### Controls, Switching, and Wiring:

4. Independent manual or occupancy sensing controls for each space (remote switch with indicator allowed for safety or security).

5. Occupant sensing control in class rooms, conference/meeting rooms, and employee lunch and break rooms.

*Exceptions:*

Spaces with multi-scene control; shop classrooms, laboratory classrooms, and preschool through 12th grade classrooms.

6. Automatic shutoff control for lighting in >5000 sq.ft buildings by time-of-day device, occupant sensor, or other automatic control.

*Exceptions:*

24 hour operation lighting; patient care areas; where auto shutoff would endanger safety or security.

7. Master switch at entry to hotel/motel guest room.

8. Separate control device for display/accent lighting, case lighting, task lighting, nonvisual lighting, lighting for sale, and demonstration lighting.

9. Photocell/astrophysical time switch on exterior lights.

*Exceptions:*

Covered vehicle entrance/exit areas requiring lighting for safety, security and eye adaptation.

10. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).

*Exceptions:*

- Electronic high-frequency ballasts;
- Luminaires not on same switch;
- Recessed luminaires 10 ft. apart or surface/pendant not continuous;
- Luminaires on emergency circuits.

**Voltage Drop:**

- 11. Feeder conductors have been designed for a maximum voltage drop of 2 percent.
- 12. Branch circuit conductors have been designed for a maximum voltage drop of 3 percent.

**Section 4: Compliance Statement**

*Compliance Statement:* The proposed lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 90.1 (2004) Standard requirements in COMcheck Version 3.4.1 and to comply with the mandatory requirements in the Requirements Checklist.

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Name - Title

Signature

Date

**Section 5: Post Construction Compliance Statement**



# COMcheck Software Version 3.4.1 Lighting Application Worksheet

## 90.1 (2004) Standard

Report Date:

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### Section 1: Allowed Lighting Power Calculation

A Area Category	B Floor Area (ft <sup>2</sup> )	C Allowed Watts / ft <sup>2</sup>	D Allowed Watts (B x C)
Common Space Types:Office - Enclosed	2520	1.1	2772
Warehouse:Medium/Bulky Material Storage	534	0.9	481
Total Allowed Watts =			3253

### Section 2: Actual Lighting Power Calculation

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
<b>Common Space Types:Office - Enclosed (2520 sq.ft.)</b>				
Linear Fluorescent 1: 48" T12 ES 34W / Electronic	4	17	136	2312
Linear Fluorescent 2: 48" T8 28W (Super T8) / Electronic	2	5	56	280
Incandescent 1: Incandescent 40W	1	8	40	320
<b>Warehouse:Medium/Bulky Material Storage (534 sq.ft.)</b>				
Incandescent 2: Incandescent 150W	1	2	150	300
Total Actual Watts =				3212

### Section 3: Compliance Calculation

If the Total Allowed Watts minus the Total Actual Watts is greater than or equal to zero, the building complies.

Total Allowed Watts = 3253  
 Total Actual Watts = 3212  
 Project Compliance = 41

**Lighting PASSES:** Design 1% better than code.



# Mechanical Compliance Certificate

## 90.1 (2004) Standard

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## Section 2: General Information

Building Location (for weather data): **Slidell, Louisiana**  
Heating Degree Days (base 65 degrees F): **1674**  
Cooling Degree Days (base 50 degrees F): **6660**  
Project Type: **New Construction**

## Section 3: Mechanical Systems List

### Quantity System Type & Description

- |   |   |
|---|---|
| 1 | HVAC System 1: Heating: Duct Furnace, Electric, Heating Capacity <65 kBtu/h / Cooling: Field-Assembled DX System, Capacity <54 kBtu/h, Air-Cooled Condenser / Single Zone |
| 1 | HVAC System 2: Heating: Duct Furnace, Electric, Heating Capacity <65 kBtu/h / Cooling: Field-Assembled DX System, Capacity <54 kBtu/h, Air-Cooled Condenser / Single Zone |
| 1 | HVAC System 4: Heating: Duct Furnace, Electric, Heating Capacity <65 kBtu/h / Cooling: Field-Assembled DX System, Capacity <54 kBtu/h, Air-Cooled Condenser / Single Zone |
| 1 | Storage Water Heater 1: Electric Storage Water Heater, Capacity: 60 gallons   |

## Section 4: Requirements Checklist

### Requirements Specific To: HVAC System 1 :

1. Hot gas bypass limited to 50% of total cooling capacity

### Requirements Specific To: HVAC System 2 :

1. Hot gas bypass limited to 50% of total cooling capacity

### Requirements Specific To: HVAC System 4 :

1. Hot gas bypass limited to 50% of total cooling capacity

### Requirements Specific To: Storage Water Heater 1 :

1. Hot water system sized per manufacturer's sizing guide  
 2. Electric Water Heater efficiency  $\geq 0.85$  EF, 291 SL, Btu/h (if > 12 kW)  
 3. First 8 ft of outlet piping is insulated  
 4. Hot water storage temperature adjustable down to 120 degrees F or lower  
 5. Heat traps provided on inlet and outlet of storage tanks

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

- 1. Load calculations per 2001 ASHRAE Fundamentals
- 2. Thermostatic controls has 5 degrees F deadband
  - Exception: Thermostats requiring manual changeover between heating and cooling
- 3. 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
- 4. Piping, insulated to 1/2 in. if nominal diameter of pipe is <1.5 in.; Larger pipe insulated to 1 in. thickness
- 5. Lavatory faucet outlet temperatures in public restrooms limited to 110 degrees F (43 degrees C)
- 6. Where separate thermostats are used for heating and cooling, acceptable measures are used to prevent simultaneous heating and cooling
- 7. Stair and elevator shaft vents are equipped with motorized dampers
- 8. Acceptable measures used to prevent simultaneous humidification and dehumidification
  - Exception: Desiccant systems and systems for uses requiring specific humidity levels (approval required)
- 9. Automatic controls for freeze protection systems present
- 10. Automatic ventilation controls (e.g., CO2 controls) or exhaust air heat recovery present for high design occupancy areas (>100 person/1000 ft2) with >3,000 cfm outside air capacities
- 11. Duct, plenum, and piping insulation surfaces suitably protected from weather, moisture, or likely damage
- 12. Duct Sealing: Pressure sensitive tape is not used as the primary sealant Longitudinal and transverse seams for ducts in unconditioned spaces Longitudinal and transverse seams and duct wall penetrations for ducts outside the building Transverse seams on buried ducts
- 13. R-6 for supply air ducts located outside the building, in ventilated attics and in unvented attic above insulated ceiling R-3.5 for supply air ducts in unvented attic with roof insulation, unconditioned and underground spaces R-3.5 for return air ducts located outside the building, in ventilated attics and in unvented attic above insulated ceiling
- 14. Humidistat controls prevent reheating, recooling, and mixing of mechanically heated air with mechanically cooled air
- 15. Exhaust air heat recovery included for systems 5,000 cfm or greater with more than 70% outside air fraction or specifically exempted
- 16. Kitchen hoods >5,000 cfm provided with 50% makeup air that is uncooled and heated to no more than 60 degrees F unless specifically exempted
- 17. Buildings with fume hood systems must have variable air volume hood design, exhaust heat recovery, or separate makeup air supply meeting the following: a) 75% make up air quantity, and /or b) within 2 degrees F of room temperature and/or c) no humidification d) no simultaneous heating and cooling

## 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 90.1 (2004) Standard requirements in COMcheck Version 3.4.1 and to comply with the mandatory requirements in the Requirements Checklist.

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Name - Title

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Signature

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## Section 6: Post Construction Compliance Statement

- HVAC record drawings of the actual installation and performance data for each equipment provided to the owner within 90 days after system acceptance.
- HVAC O&M documents for all mechanical equipment and system provided to the owner within 90 days after system acceptance.
- Written HVAC balancing report provided to the owner.



# COMcheck Software Version 3.4.1

## Mechanical Requirements Description

### 90.1 (2004) Standard

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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. For cooling systems  $\leq 240$  kBtu/h, maximum hot gas bypass capacity must be no more than 50% total cooling capacity.

#### Requirements Specific To: HVAC System 2 :

1. For cooling systems  $\leq 240$  kBtu/h, maximum hot gas bypass capacity must be no more than 50% total cooling capacity.

#### Requirements Specific To: HVAC System 4 :

1. For cooling systems  $\leq 240$  kBtu/h, maximum hot gas bypass capacity must be no more than 50% total cooling capacity.

#### Requirements Specific To: Storage Water Heater 1 :

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: Electric Water Heater efficiency  $\geq 0.85$  EF, 291 SL, Btu/h (if  $> 12$  kW)
3. Insulation must be provided for the first 8 ft of outlet piping for a constant temperature nonrecirculating storage system and for the inlet pipe between the storage tank and a heat trap in a storage system.
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. Heat traps must be provided on inlet and outlet vertical pipe risers serving storage water heaters and storage tanks not having integral heat traps and serving a nonrecirculating system. Heat traps must be installed as close as practical to the storage tank. Acceptable heat traps are either a) a device specifically designed for the purpose or b) an arrangement of tubing that forms a loop of 360 degrees F, or c) piping that from the point of connection to the water heater (inlet or outlet) includes a length of piping directed downwards before connection to the vertical piping of the supply water or hot water distribution system.

#### 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. 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.
3. All pipes serving space-conditioning systems must be insulated as follows: Hot water piping for heating systems: 1 in. for pipes  $\leq 1\frac{1}{2}$ -in. nominal diameter 2 in. for pipes  $> 1\frac{1}{2}$ -in. nominal diameter. Chilled water, refrigerant, and brine piping systems: 1 in. insulation for pipes  $\leq 1\frac{1}{2}$ -in. nominal diameter 1 1/2 in. insulation for pipes  $> 1\frac{1}{2}$ -in. nominal diameter. Steam piping: 1 1/2 in. insulation for pipes  $\leq 1\frac{1}{2}$ -in. nominal diameter 3 in. insulation for pipes  $> 1\frac{1}{2}$ -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.
4. 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-ft<sup>2</sup>-degrees F).

5. 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.
6. Where zone heating and cooling are controlled by separate zone thermostats, means (such as limit switches, mechanical stops, or, for DDC systems, software programming) must be provided to prevent simultaneous heating and cooling to the zone.
7. 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.
8. Where a zone is served by a system(s) with both humidification and dehumidification capability, means (such as limit switches, mechanical stops, or software programming) must be provided to prevent simultaneous operation of humidification and dehumidification equipment.
  - Exception: Zones served by desiccant systems, used with direct evaporative cooling in series; Systems serving zones where specific humidity levels are required.
9. All freeze protection systems, including self-regulating heat tracing, must include automatic controls capable of shutting off the systems when outside air temperatures are above 40 degrees F or when the conditions of the protected fluid will prevent freezing. Snow- and ice-melting systems must include automatic controls capable of shutting off the systems when the pavement temperature is above 50 degrees F and no precipitation is falling, and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40 degrees F.
10. Systems with design outside air capacities >3,000 cfm serving areas having an average design occupancy density exceeding 100 people per 1000 ft2 must include means to automatically reduce outside air intake below design rates when spaces are partially occupied. Ventilation controls must be in compliance with ASHRAE Standard 62 and local standards.
11. Duct and pipe insulation exposed to weather must be suitable for outdoor service; e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation must be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material. Insulation covering chilled water piping, refrigerant suction piping, or cooling ducts located outside the conditioned space must include a vapor retardant located outside the insulation (unless the insulation is inherently vapor retardant), all penetrations and joints of which must be sealed.
12. Duct Sealing Requirements: - Pressure sensitive tape prohibited as the primary sealant - Longitudinal and transverse seams for ducts in unconditioned spaces - Longitudinal and transverse seams and duct wall penetrations for ducts outside the building - Transverse seams on buried ducts
13. All supply and return ducts and plenum installed as part of an HVAC air distribution system must be thermally insulated: R-6 for supply air ducts located outside the building, in ventilated attics and in unvented attic above insulated ceiling, R-3.5 for supply air duct insulation in unvented attic with roof insulation, unconditioned and underground spaces, R-3.5 for return air ducts located outside the building, in ventilated attics and in unvented attic above insulated ceiling.
14. Where humidistatic controls are provided, such controls must prevent reheating, mixing of hot and cold air streams, or other means of simultaneous heating and cooling of the same air stream. Exceptions: - capability to first reduce flow rate - cooling capacity <80 kBtu/h and capability to unload cooling equipment - cooling capacity <40 kBtu/h - rigid humidity requirements - site-recovered or site-solar energy sources or - use of a desiccant systems.
15. Individual fan systems with a design supply air capacity of 5000 cfm or greater and minimum outside air supply of 70% or greater of the supply air capacity must have an energy recovery system with at least a 50% effectiveness. Exceptions: - Systems serving spaces that are not cooled and heated to <60 degrees F. - Commercial kitchen hoods (grease) classified as Type 1 by NFPA 96 - Systems exhausting toxic, flammable, paint, or corrosive fumes or dust If an air economizer is also required, heat recovery must be bypassed or controlled to permit air economizer operation.
16. Individual kitchen exhaust hoods larger than 5000 cfm must be provided with make-up air sized for at least 50% of exhaust air volume that is uncooled and either unheated or heated to no more than 60 degrees F Exceptions: - Where hoods are used to exhaust ventilation air that would otherwise exfiltrate or be exhausted by other fan systems. - Certified grease extractor hoods that require a face velocity no >60 fpm.
17. Buildings with fume hood systems having a total exhaust rate >15,000 cfm must either have variable air volume hood design, exhaust air heat recovery, or separate make up air supply meeting the following makeup air requirements: - at least 75% of exhaust flow rate - heated to no more than 2 degrees F below room setpoint temperature - cooled to no lower than 2 degrees F above room setpoint temperature - no humidification added - no simultaneous heating and cooling