

c) Heat recovery systems to precondition makeup air from fume hood exhaust in accordance with Section 6.5.6.1, Exhaust Air Energy Recovery, without using any exception.

16. 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. If an air economizer is also required, heat recovery must be bypassed or controlled to permit air economizer operation.

Exception(s):

- Laboratory fume hood systems with a total exhaust rate \leq 5000 cfm.
- Systems serving spaces that are not cooled and heated to $<60^{\circ}\text{F}$.
- Systems with more than 60% of the outdoor heating energy is provided from site-recovered or site solar energy.
- Systems exhausting toxic, flammable, paint, or corrosive fumes or dust.
- Commercial kitchen hoods used for collecting and removing grease vapors and smoke.
- Systems requiring dehumidification that employ energy recovery in series with the cooling coil.
- Where the largest exhaust source is less than 75% of the design outdoor airflow.
- Heating energy recovery.

6. 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.
Exception(s):
- Ventilation systems serving unconditioned spaces.
 - Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height above grade.
7. 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(s):
- Zones served by desiccant systems, used with direct evaporative cooling in series; Systems serving zones where specific humidity levels are required.
8. 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°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°F and no precipitation is falling, and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F.
9. 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.
10. Duct Sealing Requirements:
- a) Pressure sensitive tape used as the primary sealant is certified to comply with UL-181A or UL-181B,
 - b) Longitudinal and transverse seams for ducts in unconditioned spaces,
 - c) Longitudinal and transverse seams and duct wall penetrations for ducts outside the building,
 - d) Transverse seams on buried ducts
11. 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(s):
- Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height.
 - Systems with a design outside air intake or exhaust capacity of 300 cfm (140 L/s) or less.
12. 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.
13. 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.
Exception(s):
- Capability of first reducing supply air volume 50% or less of the design rate or minimum outdoor air ventilation, or per regulatory standard, whichever is larger, before combined heating/cooling occurs.
 - Cooling capacity <80 kBtu/h and capability to unload cooling equipment.
 - Cooling capacity <40 kBtu/h.
 - Systems serving spaces where rigid humidity requirements exist. See code language for qualifying spaces.
 - Site-recovered or site-solar energy sources or.
 - Use of a desiccant systems.
14. 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°F
Exception(s):
- 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.
15. Buildings with fume hood systems having an exhaust rate > 15,000 cfm has at least one of the following features:
- a) VAV hood exhaust and room supply systems capable of reducing exhaust and makeup air volume to 50% or less of design values.
 - b) Direct makeup (auxiliary) air supply equal to at least 75% of the exhaust rate, heated no warmer than 2°F below room setpoint, cooled to no cooler than 3°F above room setpoint, no humidification added, and no simultaneous heating and cooling used for dehumidification control.



Mechanical Requirements Description

90.1 (2007) Standard

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 the ASHRAE 90.1-2007 Standard and must meet the following minimum efficiency: System: 13.00 SEER
- 2. For cooling systems ≤ 240 kBtu/h, maximum hot gas bypass capacity must be no more than 50% total cooling capacity.
- 3. VAV fans with static pressure sensors are placed in a position such that the controller setpoint is no greater than one-third the total design fan static pressure. If placement results in the sensor being located downstream of major duct splits, multiple sensors are installed in each major branch.
 - Exception: Systems with DDC of individual zone boxes reporting to the central control panel and reset of static pressure setpoint based on the zone requiring the most pressure.
- 4. Systems with DDC of individual zone boxes reporting to the central control panel has static pressure setpoint reset based on the zone requiring the most pressure.

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

1. 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 $\frac{1}{2}$ in. insulation for pipes $> 1\frac{1}{2}$ -in. nominal diameter.
 - Steam piping:
 - 1 $\frac{1}{2}$ 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(s):
 - Factory-installed piping within HVAC equipment.
 - Piping that conveys fluids having a design operating temperature range between 60°F and 105°F.
 - Piping that conveys fluids that have not been heated or cooled through the use of nonrenewable energy.
 - Runout piping not exceeding 4 ft in length between shutoff valve and coil and 1 in. in diameter between the control valve and HVAC coil.
 - Pipe unions in heating systems.
2. Heating and cooling system design loads for sizing systems and equipment must be determined using generally accepted engineering standards and handbooks acceptable to the adopting authority (for example, ASHRAE Handbook of Fundamentals).
3. Thermostats controlling both heating and cooling must be capable of maintaining a 5°F deadband (a range of temperature where no heating or cooling is provided).
 - Exception(s):
 - Deadband capability is not required if the thermostat does not have automatic changeover capability between heating and cooling.
 - Special occupancy or special applications where wide temperature ranges are not acceptable and are approved by the authority having jurisdiction.
4. Demand control ventilation (DCV) required for high design occupancy areas (> 40 person/1000 ft² in spaces > 500 ft²) and served by systems with any one of 1) an air-side economizer, 2) automatic modulating control of the outdoor air damper, or 3) a design outdoor airflow greater than 3000 cfm.
 - Exception(s):
 - Systems with heat recovery.
 - Multiple-zone systems without DDC of individual zones communicating with a central control panel.
 - Systems with a design outdoor airflow less than 1200 cfm.
 - Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1200 cfm.
5. 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.

- Systems with more than 60% of the outdoor heating energy is provided from site-recovered or site solar energy.
- Systems exhausting toxic, flammable, paint, or corrosive fumes or dust.
- Commercial kitchen hoods.
- Systems requiring dehumidification with cooling coil energy recovery in series with the cooling coil.
- Where the largest exhaust source is less than 75% of the design outdoor airflow.
- Heating energy recovery.

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 90.1 (2007) Standard, Chapter 8, requirements in COMcheck Version 3.9.0 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title

Signature

Date

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.

The above post construction requirements have been completed.

Principal Mechanical Designer-Name

Signature

Date

- Thermostats requiring manual changeover between heating and cooling
- Special occupancy or special applications where wide temperature ranges are not acceptable and are approved by the authority having jurisdiction.
- 4. Demand control ventilation (DCV) present for high design occupancy areas (>40 person/1000 ft2 in spaces >500 ft2) and served by systems with any one of 1) an air-side economizer, 2) automatic modulating control of the outdoor air damper, or 3) a design outdoor airflow greater than 3000 cfm.
Exception(s):
 - Systems with heat recovery.
 - Multiple-zone systems without DDC of individual zones communicating with a central control panel.
 - Systems with a design outdoor airflow less than 1200 cfm.
 - Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1200 cfm.
- 5. Where separate thermostats are used for heating and cooling, acceptable measures are used to prevent simultaneous heating and cooling
- 6. Stair and elevator shaft vents are equipped with motorized dampers
Exception(s):
 - Ventilation systems serving unconditioned spaces.
 - Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height above grade.
- 7. Acceptable measures used to prevent simultaneous humidification and dehumidification
Exception(s):
 - Desiccant systems and systems for uses requiring specific humidity levels (approval required)
- 8. Automatic controls for freeze protection systems present
- 9. Duct, plenum, and piping insulation surfaces suitably protected from weather, moisture, or likely damage
- 10. Duct Sealing:
 - a) Pressure sensitive tape used as the primary sealant is certified to comply with UL-181A or UL-181B,
 - b) longitudinal and transverse seams for ducts in unconditioned spaces,
 - c) longitudinal and transverse seams and duct wall penetrations for ducts outside the building,
 - d) transverse seams on buried ducts
- 11. Motorized, automatic shutoff dampers required on exhaust and outdoor air supply openings
Exception(s):
 - Gravity dampers acceptable in buildings <3 stories
 - Gravity dampers acceptable in systems with outside or exhaust air flow rates less than 300 cfm where dampers are interlocked with fan
- 12. 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
- 13. Humidistat controls prevent reheating, recooling, and mixing of mechanically heated air with mechanically cooled air
Exception(s):
 - Capability of first reducing supply air volume 50% or less of the design rate or minimum outdoor air ventilation, or per regulatory standard, whichever is larger, before combined heating/cooling occurs.
 - 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.
- 14. Kitchen hoods >5,000 cfm provided with 50% makeup air that is uncooled and heated to no more than 60°F unless specifically exempted
Exception(s):
 - 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.
- 15. Buildings with fume hood systems having an exhaust rate > 15,000 cfm has at least one of the following features:
 - a) VAV hood exhaust and room supply systems capable of reducing exhaust and makeup air volume to 50% or less of design values.
 - b) Direct makeup air supply equal to at least 75% of the exhaust rate, heated no warmer than 2°F below room setpoint, cooled to no cooler than 3°F above room setpoint, no humidification added, and no simultaneous heating and cooling used for dehumidification control.
 - c) Heat recovery systems to precondition makeup air from fume hood exhaust.
- 16. Exhaust air heat recovery included for systems 5,000 cfm or greater with more than 70% outside air fraction or specifically exempted.
Exception(s):
 - Laboratory fume hood systems with a total exhaust rate <= 5000 cfm.
 - Systems serving spaces that are not cooled and heated to <60°F.



Mechanical Compliance Certificate

90.1 (2007) Standard

Section 1: Project Information

Project Type: **Alteration**

Project Title : KBR ENTERPRISE

Construction Site:
176 Strawberry Street
Slidell, LA 70360

Owner/Agent:
Kelly Bartman Barber
KBR
Slidell, LA 70460

Designer/Contractor:
Dammon Engineering
554 Old Spanish Trail
Slidell, LA 70458
985-649-5832

Section 2: General Information

Building Location (for weather data):
Climate Zone:

Slidell, Louisiana
2a

Section 3: Mechanical Systems List

Quantity **System Type & Description**

- | | |
|---|---|
| 1 | HVAC System 1:
Cooling: 1 each - Split System, Capacity = 5 kBtu/h, Air-Cooled Condenser
Compliance required. |
|---|---|

Section 4: Requirements Checklist

Requirements Specific To: HVAC System 1 :

- 1. Equipment minimum efficiency: System: 13.00 SEER
- 2. Hot gas bypass limited to 50% of total cooling capacity
- 3. VAV fans with static pressure sensors are placed in a position such that the controller setpoint is no greater than one-third the total design fan static pressure. If placement results in the sensor being located downstream of major duct splits, multiple sensors are installed in each major branch.
 - Exception: Systems with DDC of individual zone boxes reporting to the central control panel and reset of static pressure setpoint based on the zone requiring the most pressure.
- 4. Systems with DDC of individual zone boxes reporting to the central control panel has static pressure setpoint reset based on the zone requiring the most pressure.

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

- 1. 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(s):
 - Piping within HVAC equipment.
 - Fluid temperatures between 60 and 105°F.
 - Fluid not heated or cooled.
 - Runouts <4 ft in length.
 - Pipe unions in heating systems.
- 2. Load calculations per acceptable engineering standards and handbooks
- 3. Thermostatic controls have 5°F deadband
Exception(s):

- 4. All exterior building grounds luminaires that operate at greater than 100W have minimum efficacy of 60 lumen/watt.

Exceptions:

- Lighting that has been claimed as exempt and is identified as such in Section 3 table above.
- Lighting that is specifically designated as required by a health or life safety statute, ordinance, or regulation.
- Emergency lighting that is automatically off during normal building operation.
- Lighting that is controlled by motion sensor.

Exterior Lighting PASSES: Design 27% better than code.

Section 5: Compliance Statement

Compliance Statement: The proposed exterior 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 (2007) Standard requirements in COMcheck Version 3.9.0 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title

Signature

Date

Section 5: Post Construction Compliance Statement

Record Drawings and Operating and Maintenance Manuals:

- 1. Construction documents with record drawings and operating and maintenance manuals provided to the owner.

Lighting Designer or Contractor Name

Signature

Date



Exterior Lighting Compliance Certificate

90.1 (2007) Standard

Section 1: Project Information

Project Type: **Alteration**

Project Title : KBR ENTERPRISE

Construction Site:
176 Strawberry Street
Slidell, LA 70360

Owner/Agent:
Kelly Bartman Barber
KBR
Slidell, LA 70460

Designer/Contractor:
Dammon Engineering
554 Old Spanish Trail
Slidell, LA 70458
985-649-5832

Section 2: Exterior Lighting Area/Surface Power Calculation

A Exterior Area/Surface	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B x C)	F Proposed Watts
Parking area(s)	35 ft2	0.15	Yes	5	4
				Total Tradable Watts* =	5
				Total Allowed Watts =	5
				Total Allowed Supplemental Watts** =	0

* Wattage tradeoffs are only allowed between tradable areas/surfaces.

** A supplemental allowance equal to 5% of total allowed wattage may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Section 3: Exterior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)	
Parking area(s) (35 ft2): Tradable Wattage					
Incandescent 1: Incandescent 75W	3	4	1	4	
				Total Tradable Proposed Watts =	4

Section 4: Requirements Checklist

Lighting Wattage:

1. Within each non-tradable area/surface, total proposed watts must be less than or equal to total allowed watts. Across all tradable areas/surfaces, total proposed watts must be less than or equal to total allowed watts.

Compliance: Passes.

Controls, Switching, and Wiring:

2. All exemption claims are associated with fixtures that have a control device independent of the control of the nonexempt lighting.
3. All lighting fixtures are controlled by a photosensor or astronomical time switch that is capable of automatically turning off the fixture when sufficient daylight is available or the lighting is not required.

Exceptions:

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

Exterior Lighting Efficacy:



Interior Lighting and Power Compliance Certificate

90.1 (2007) Standard

Section 1: Project Information

Project Type: **Alteration**

Project Title : KBR ENTERPRISE

Construction Site:
176 Strawberry Street
Slidell, LA 70360

Owner/Agent:
Kelly Bartman Barber
KBR
Slidell, LA 70460

Designer/Contractor:
Dammon Engineering
554 Old Spanish Trail
Slidell, LA 70458
985-649-5832

Section 2: Interior Lighting and Power Calculation

A Area Category	B Floor Area (ft ²)	C Allowed Watts / ft ²	D Allowed Watts (B x C)
Office Warehouse (Common Space Types:Office - Enclosed): Exempt			
Total Allowed Watts =			N/A

Area Category Exemption Qualifications

Activity Area	Total Wattage		Total Pre-Alt. Fixtures	# Fixtures Repl./Added
	Pre-Alt.	Post-Alt.		
Office Warehouse (Common Space Types:Office - Enclosed 6020 sq.ft.): Exemption: Less than 50% fixture replacement.	30	30	15	5

Section 3: Interior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Office Warehouse (Common Space Types:Office - Enclosed 6020 sq.ft.): Exempt				
Total Proposed Watts =				N/A

Section 4: Requirements Checklist

Lighting Wattage:

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

Allowed Watts	Proposed Watts	Complies
N/A	N/A	Passes

2. Exit signs 5 Watts or less per sign.

Controls, Switching, and Wiring:

3. Independent manual or occupancy sensing controls for each space (remote switch with indicator allowed for safety or security).
 4. 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.
 5. Automatic shutoff control for lighting in >5000 sq.ft buildings by time-of-day device, occupant sensor, or other automatic control.

- 12. Component R-values & U-factors labeled as certified.
- 13. 'Other' components have supporting documentation for proposed U-Factors.

Section 4: Compliance Statement

Compliance Statement: The proposed envelope alteration project represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed envelope alteration project has been designed to meet the 90.1 (2007) Standard requirements in *COMcheck* Version 3.9.0 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title

Signature

Date



Envelope Compliance Certificate

90.1 (2007) Standard

Section 1: Project Information

Project Type: **Alteration**

Project Title : KBR ENTERPRISE

Construction Site:
176 Strawberry Street
Slidell, LA 70360

Owner/Agent:
Kelly Bartman Barber
KBR
Slidell, LA 70460

Designer/Contractor:
Dammon Engineering
554 Old Spanish Trail
Slidell, LA 70458
985-649-5832

Section 2: General Information

Building Location (for weather data): **Slidell, Louisiana**
Climate Zone: **2a**
Building Type for Envelope Requirements: **Non-Residential**

Activity Type(s) **Floor Area**
Office Warehouse (Common Space Types:Office - Enclosed) 6020

Section 3: Requirements Checklist

Envelope PASSES

Climate-Specific Requirements:

Post-Alteration Assembly	R-Value		Proposed		Max. Allowed	
	Cavity	Cont.	U-Factor	SHGC	U-Factor	SHGC
Roof 1: Insulation Entirely Above Deck	---	30.0	0.032	---	0.048	---
Exterior Wall 1: Metal Building Wall Exemption: Cavity filled with minimum R-3/inch insulation	---	---	---	---	---	---
Floor 1: Slab-On-Grade:Unheated	---	1.0	1.000	---	0.730	---

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 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.