

BUILDING PERMIT		City of Philadelphia Department of Licenses and Inspections 1401 John F. Kennedy Blvd. Philadelphia, PA 19102		Permit Number: 198901	
This permit may be revoked if the information has been misrepresented or not provided.				Fee: \$24,500.00	Date Issued: 04/14/09
Location of work: 12901 TOWNSEND RD PHILADELPHIA, PA 19154-1001 COMMUNITY COLLEGE				District: East District Phone Number: 215-685-0580	
Owner: COMMUNITY COLLEGE OF PHILA 1700 SPRING GARDEN ST PHILA PA, 191033291		Licensed Contractor:		Area: 49199 S.F.	Estimated Cost: \$12,418,147.00
				Plan Examiner: MICHAEL PETNER	
				Certificate of Occupancy (C.O.) is part of this permit.	

If no Licensed Contractor is named, the Owner assumes all responsibility for compliance with the Code.

Occupancy:
3-STORY ADDITION FOR USE AS PART OF A COLLEGE EDUCATIONAL FACILITY

Description of work authorized by this permit:
CONSTRUCTION OF A 3 STORY ADDITION AND A 1 STORY ADDITION TO THE EXISTING BUILDING FOR USE AS PART OF A SCHOOL.

INSPECTIONS

The owner or contractor is required to notify the District Office listed above prior to starting any work, and at least 24 hours in advance of the required inspections. Failure to notify the District will result in the issuance of a \$75 ticket by the Department. Inspections will not be made unless the Department-Approved plans are on the job.

The Department is authorized by the Code to Charge a \$50 reinspection fee if:

1. The inspection reveals that the work is not constructed in accordance with the Code;
2. The work is not ready for inspection; or
3. Access to the work to be inspected is not provided.

THIS PERMIT REQUIRES THE FOLLOWING INSPECTIONS:
INITIAL/SITE - FOUNDATION - UNDER SLAB/FLOOR - FRAMING/CLOSE-IN - FINAL

Separate permits are required for plumbing, electrical, fire suppression, and for the use of streets and sidewalks, including shelter platforms, scaffolding, dumpsters, closures, etc.

Limitation: This permit shall become invalid if the authorized work is not commenced within six (6) months of the date of issuance or if the work is suspended or abandoned for a period of six (6) months after commencing work. Permits may be revoked as per Section A-302.9 of the Administrative Code. This permit shall expire five (5) years from the date of issuance.

PA ONE CALL SYSTEM is required to be notified by PA Act 38 of 1991, three (3) working days prior to disturbing the earth with any type of powered equipment. Also, this permit does not constitute approval from any State or Federal agency, if required.

Where a Certificate of Occupancy (C.O.) is required, such buildings and spaces shall not be occupied until Final Inspection is made and the Certificate is issued by the Department.

All provisions of the Code and other City Ordinances must be complied with, whether specified herein or not.

This Permit **does not** constitute Zoning Approval.

Tax Exemption (Abatement): Information and applications as to the eligibility for real estate exemption (abatement) for new construction or improvements may be obtained by contacting the Board of Revision of Taxes, 3rd Floor, 601 Walnut Street, Phila., PA 19106. All applications must be filed with the Board within sixty (60) days from the date the permit was issued. Board of Revision of Taxes Phone Number: 215-686-9270.

POST A TRUE COPY OF THIS PERMIT IN A CONSPICUOUS LOCATION ON THE PREMISES

FAILURE TO POST THIS PERMIT WILL RESULT IN THE ISSUANCE BY THE DEPARTMENT OF A \$75 TICKET
FOR ALL NEW CONSTRUCTION, ADDITIONS, AND WHERE A CERTIFICATE OF OCCUPANCY IS REQUIRED, THE ASSOCIATED
ZONING / USE PERMIT SHALL BE POSTED ALONGSIDE THIS BUILDING PERMIT.



PLAN REVIEW FORM

Plan Number:

1 9 8 9 0 1

12901 TOWNSEND RD

Address number Ext. Dir. (N. E. S. W.) Street name Designation (Ave. Blvd. St) Unit

Plan Review Notations (These are requirements of the permit. They are integral to the approved plan.)

These plans have not been reviewed for compliance with the federal requirements of the Fair Housing Amendments Act of 1988 and the American with Disabilities Act of 1990. Please be advised that the responsible party of ownership of this property may be liable for certain provisions and/or regulations included with the above noted federal legislation. See Sections 1007, 3409, and Chapter 11 of the Philadelphia Building Code and the ICC/ANSI A117.1-98 standard for accessibility requirements.

This approval covers only the work shown on the attached plans and does not relieve the architect and/or engineer from the responsibility for total compliance with the Philadelphia Building, Fire, and Housing Codes. Install a fire extinguisher on each floor under construction, alteration, or demolition. (Except single family dwellings) Separate permits required for [X] Electrical, [X] Plumbing, [X] Ductwork, [X] Fire Suppression Systems, and _____

These plans have not been reviewed for conformance with the Electrical and Plumbing Codes. Separate submissions of plans are required when applications are made for electrical and plumbing permits. These applications are required to be submitted by the licensed individuals in those trades at the Mechanical Services Unit located at the S.W. corner of the MSB Concourse.

Establishments where food is prepared, served, and/or manufactured: plans and specifications must be submitted for review and approval to the Philadelphia Health Department, Office of Food Protection, 500 S. Broad Street, prior to beginning construction, remodeling, alteration, or demolition.

CALL DISTRICT OFFICE PRIOR TO COMMENCING WORK. (Phone Number is listed on Building Permit)

Type of Construction: [] IA [] IB [] IIA [X] IIB [] IIIA [] IIIB [] IV [] VA [] VB
Use & Occupancy Classification: B A3 C.O. Required: [] NO [X] YES

Code Edition: 2006

Building IS NOT fully sprinklered.

New Stairs

Group R-3 and within dwelling units in occupancy Group R-2
Treads= [X] 11" Min Treads= [] 9" Min
Risers= [] 7" Max Risers= [] 8.25" Max
Handrails= [X] both sides of the stairs [] one side of the stairs.
Width = [] 36" [] 44"
Open balusters shall be spaced such that a 4" & sphere shall not pass thru, minimum headroom of 6'-8".

Mechanical Exhaust:

Mechanically exhaust room air to outside For bathrooms and powder rooms without windows

Kitchen (commercial)

Install an approved commercial kitchen exhaust hood and duct system and a fixed automatic Fire Extinguishing system over stoves and deep fryers. Separate Permit required.

Manual Fire Alarm System required with fire alarm boxes located:

[X] Not more than 5' from the entrance to each exit.
[] Located in the exit stairway at the exit discharge. (Group R-2 occupancies, having a single exit, and not exceeding 3 stories in height are permitted to have a single manual fire alarm box)
All fire alarm boxes shall have a sign mounted immediately above the box which states: "IN CASE OF FIRE - SOUND ALARM AND CALL 911".

Alarm notification appliances

[X] Visible Alarms required in:
[] Public and common areas
[] Employee work areas
[] Groups I-1 and R-1 (Table 907.9.1.3)
[] Group R-2
[X] Audible Alarms

Exit Signs

Provide Approved illuminated Exit Signs at all required means of Egress. Where the Exit signs are not visible from all portions of the Area, Install additional illuminated Exit signs with directional Arrows such that any point in the Exit Access is not more than 100 Feet from the nearest visible sign. Any door, Passageway or door, which is not a means of Egress, shall be properly identified as to its purpose..

Means of Egress Lighting

Provide not less than one(1) Foot- Candle (10.76 Lux) of artificial lighting in all Means of Egress and Exit Discharges at all times the building is occupied so that the paths of exit travel will always be visible. Separate Electrical Permit required.

Connect To An Emergency Electrical System that conforms with the requirement of NFPA 70. Emergency lighting shall operate within 10 seconds of failure of the normal power supply. Separate Electrical Permit required.

Interior Finishes

All curtains, draperies, hanging and other decorative materials suspended from walls or ceiling shall be non-combustible or maintained flame resistant in accordance with both the small and large scale tests of NFPA 701.

Total number of sheets: _____ Approval Date: 3/30/09
Plans Examiner's Signature: Michael Pitman (mm / dd / yyyy)
Number of sheets larger than 8 1/2" X 14": 80

BUILDING PERMIT		City of Philadelphia Department of Licenses and Inspections 1401 John F. Kennedy Blvd. Philadelphia, PA 19102		Permit Number: 203904	
This permit may be revoked if the information has been misrepresented or not provided.				Fee: \$18,910.00	Date Issued: 04/14/09
Location of work: 12901 TOWNSEND RD PHILADELPHIA, PA 19154-1001 EXISTING PORTION				District: East District Phone Number: 215-685-0580	
Owner: COMMUNITY COLLEGE OF PHILA 1700 SPRING GARDEN ST PHILA PA, 19103-3291		Licensed Contractor:		Area: 47369 S.F.	Estimated Cost: \$7,600,000.00
				Plan Examiner: MICHAEL PETNER	
				CERTIFICATE OF OCCUPANCY IS NOT PART OF THIS PERMIT	
If no Licensed Contractor is named, the Owner assumes all responsibility for compliance with the Code.					
Occupancy: COLLEGE EDUCATIONAL FACILITY					
Description of work authorized by this permit: ALTERATIONS AND SITE IMPROVEMENTS TO AN EXISTING SCHOOL.					
INSPECTIONS					
The owner or contractor is required to notify the District Office listed above prior to starting any work, and at least 24 hours in advance of the required inspections. Failure to notify the District will result in the issuance of a \$75 ticket by the Department. Inspections will not be made unless the Department-Approved plans are on the job.					
The Department is authorized by the Code to Charge a \$50 reinspection fee if:					
<ol style="list-style-type: none"> 1. The inspection reveals that the work is not constructed in accordance with the Code; 2. The work is not ready for inspection; or 3. Access to the work to be inspected is not provided. 					
THIS PERMIT REQUIRES THE FOLLOWING INSPECTIONS:					
INITIAL/SITE - FOUNDATION - UNDERSLAB/FLOOR - FRAMING/CLOSE-IN - INSULATION INSPECTION					
Separate permits are required for plumbing, electrical, fire suppression, and for the use of streets and sidewalks, including shelter platforms, scaffolding, dumpsters, closures, etc.					
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City of Philadelphia Department of Licenses and Inspections

PLAN REVIEW FORM

Plan Number:

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1 2 9 0 1 T O W N S E N D R D

Address number Ext. Dir. (N. E. S. W.) Street name Designation (Ave. Blvd. St) Unit

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CALL DISTRICT OFFICE PRIOR TO COMMENCING WORK. (Phone Number is listed on Building Permit)

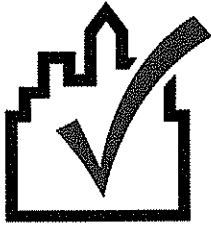
Type of Construction: IA IB IIA IIB IIIA IIIB IV VA VB

Use & Occupancy Classification: _____ C.O. Required: NO YES

Code Edition: 2006

SEE AP 198901

Total number of sheets: _____	<i>Make Petin</i> Plans Examiner's Signature	Approval Date <u>3/30/09</u> (mm / dd / yyyy)
Number of sheets larger than 8 1/2" X 14": <u>0</u>		



COMcheck Software Version 3.6.0 Envelope Compliance Certificate

2006 IECC

Section 1: Project Information

Project Type: **Addition**

Project Title : Community College of Philadelphia

Construction Site:
12901 Townsend Road
Philadelphia, PA 19154

Owner/Agent:
Gary Bixby
Community College of Philadelphia

Designer/Contractor:
Tom Fantacone
Fletcher Thompson Architecture
Engineering
27 Schoolhouse Road
Somerset, NJ 08873

PLANS APPROVED
AS NOTED

MAR 06 2009

CITY OF PHILADELPHIA
LICENSES AND INSPECTIONS

Section 2: General Information

Building Location (for weather data): **Philadelphia, Pennsylvania**
Climate Zone: **4a**
Heating Degree Days (base 65 degrees F): **4954**
Cooling Degree Days (base 50 degrees F): **3623**
Vertical Glazing / Wall Area Pct.: **37%**

Activity Type(s)	Floor Area
School/University	49199

Section 3: Requirements Checklist

Envelope PASSES: Design 21% 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
Orientation: EAST					
Exterior Wall 1: Curtainwall framing, Heat capacity 0.9	1792	---	---	0.630	0.089
Window 1: Curtainwall vision glass, Clear, SHGC 0.38	1537	---	---	0.260	0.550
Exterior Wall 6: Curtainwall spandrel glass, Heat capacity 0.9	1453	---	---	0.260	0.089
Exterior Wall 2: Steel-Framed, 16" o.c.	1290	11.0	13.0	0.049	0.125
Window 2: Curtain Wall:Double Pane with Low-E, Clear, SHGC 0.38	673	---	---	0.260	0.500
Orientation: SOUTH					
Exterior Wall 3: Steel-Framed, 16" o.c.	1749	11.0	13.0	0.049	0.125
Window 3: Metal Frame with Thermal Break:Double Pane with Low-E, Clear, SHGC 0.38	943	---	---	0.260	0.550
Exterior Wall 4: Steel-Framed, 16" o.c.	2521	11.0	13.0	0.049	0.125
Window 4: Curtain Wall:Double Pane with Low-E, Clear, SHGC 0.38	654	---	---	0.260	0.500
Window 5: Metal Frame with Thermal Break:Double Pane with Low-E, Clear, SHGC 0.38	210	---	---	0.260	0.550
Door 1: Glass, Non-Entrance Door, SHGC 0.38	49	---	---	0.260	0.550
Exterior Wall 7: Curtain wall framing, Heat capacity 0.9	735	---	---	0.630	0.089
Window 8: Metal Frame with Thermal Break:Double Pane with Low-E, Clear, SHGC 0.38	534	---	---	0.260	0.550
Exterior Wall 8: Curtain wall spandrel glass, Heat capacity 0.9	169	---	---	0.260	0.089
Door 3: Glass, Entrance Door, SHGC 0.38	49	---	---	0.260	0.850
Orientation: WEST					



COMcheck Software Version 3.6.0 Interior Lighting Compliance Certificate

2006 IECC

Section 1: Project Information

Project Type: **Addition**

Project Title : Community College of Philadelphia

Construction Site:

12901 Townsend Road
Philadelphia, PA 19154

Owner/Agent:

Gary Bixby
Community College of Philadelphia

Designer/Contractor:

Tom Fantacone
Fletcher Thompson Architecture
Engineering
27 Schoolhouse Road
Somerset, NJ 08873

Section 2: General Information

Building Use Description by: **Activity Type**

Activity Type(s)

School/University

Floor Area

49199

Section 3: Requirements Checklist

Interior Lighting:

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

Allowed Watts	Proposed Watts	Complies
59039	29988	--

Controls, Switching, and Wiring:

2. Independent controls for each space (switch/occupancy sensor).

Exceptions:

Areas designated as security or emergency areas that must be continuously illuminated.

Lighting in stairways or corridors that are elements of the means of egress.

3. Master switch at entry to hotel/motel guest room.
 4. Individual dwelling units separately metered.
 5. Each space provided with a manual control to provide uniform light reduction by at least 50%.

Exceptions:

Only one luminaire in space;

An occupant-sensing device controls the area;

The area is a corridor, storeroom, restroom, public lobby or sleeping unit.

Areas that use less than 0.6 Watts/sq.ft.

6. Automatic lighting shutoff control in buildings larger than 5,000 sq.ft.

Exceptions:

Sleeping units, patient care areas; and spaces where automatic shutoff would endanger safety or security.

7. Photocell/astronomical time switch on exterior lights.

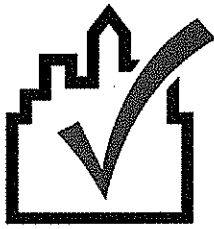
Exceptions:

Lighting intended for 24 hour use.

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

Exceptions:

Electronic high-frequency ballasts; Luminaires on emergency circuits or with no available pair.



COMcheck Software Version 3.6.0 Interior Lighting Application Worksheet

2006 IECC

Section 1: Allowed Lighting Power Calculation

A Area Category	B Floor Area (ft ²)	C Allowed Watts / ft ²	D Allowed Watts (B x C)
School/University	49199	1.2	59039
Total Allowed Watts =			59039

Section 2: Proposed Lighting Power Calculation

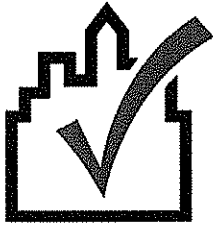
A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
School/University (49199 sq.ft.)				
Compact Fluorescent 1: A: Triple 4-pin 32W / Electronic	1	302	35	10570
Linear Fluorescent 1: B: 48" T8 32W / Premium efficiency	3	87	105	9135
Linear Fluorescent 2: C: 46" T5 28W / Premium efficiency	2	9	61	549
Compact Fluorescent 9: D: Twin Tube 40W / Electronic	2	2	88	176
Linear Fluorescent 4: E: 48" T8 32W / Premium efficiency	2	15	70	1050
Linear Fluorescent 6: F: 48" T8 32W / Premium efficiency	2	32	70	2240
Linear Fluorescent 7: G: 48" T8 32W / Premium efficiency	1	6	35	210
Compact Fluorescent 2: GG: Triple 4-pin 42W / Electronic	2	1	92	92
Compact Fluorescent 3: H: Triple 4-pin 42W / Electronic	1	23	0	0
Compact Fluorescent 4: HH: Triple 4-pin 42W / Electronic	1	0	0	0
Incandescent 1: I: Incandescent 50W	1	0	100	0
Compact Fluorescent 5: J: Triple 4-pin 42W / Electronic	1	6	0	0
Compact Fluorescent 6: K: Twin Tube 40W / Electronic	4	4	0	0
Compact Fluorescent 7: L: Triple 4-pin 18W / Electronic	1	4	0	0
Compact Fluorescent 8: M: Twin Tube 24/26/27W / Electronic	2	39	0	0
Incandescent 2: N: Incandescent 50W	1	0	0	0
Linear Fluorescent 8: O: 22" T5 14W / Premium efficiency	1	6	0	0
Linear Fluorescent 9: O: 34" T5 HO 39W / Premium efficiency	1	0	0	0
Linear Fluorescent 10: P: 48" T8 32W / Premium efficiency	3	22	105	2310
Linear Fluorescent 11: Q: 48" T8 32W / Premium efficiency	3	18	105	1890
Linear Fluorescent 12: R: 48" T8 32W / Premium efficiency	1	0	35	0
Linear Fluorescent 13: T: 48" T8 32W / Premium efficiency	2	8	70	560
Linear Fluorescent 14: U: 46" T5 28W / Premium efficiency	2	6	61	366
Incandescent 3: Z: Incandescent 35W	2	12	70	840
Total Proposed Watts =			29988	

Section 3: Compliance Calculation

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

Total Allowed Watts = 59039
 Total Proposed Watts = 29988
 Project Compliance = 29051

Interior Lighting TBD: Invalid fixture wattage.



COMcheck Software Version 3.6.0 Exterior Lighting Compliance Certificate

2006 IECC

Section 1: Project Information

Project Type: **Addition**

Project Title : Community College of Philadelphia

Construction Site:

12901 Townsend Road
Philadelphia, PA 19154

Owner/Agent:

Gary Bixby
Community College of Philadelphia

Designer/Contractor:

Tom Fantacone
Fletcher Thompson Architecture
Engineering
27 Schoolhouse Road
Somerset, NJ 08873

Section 2: Exterior Lighting Area/Surface Power Calculation

A Exterior Area/Surface	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (C x D)	F Proposed Watts
Parking area(s)	0 ft2	0.15	Yes	0	6754
				Total Tradable Watts* =	0
				Total Allowed Watts =	0
				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): Tradable Wattage				
HID 1: SF: Metal Halide 175W / Standard	1	5	192	960
HID 2: SG: Metal Halide 175W / Standard	1	10	192	1920
HID 3: SH: Metal Halide 175W / Standard	1	3	192	576
HID 4: SJ: Metal Halide 175W / Standard	1	8	192	1536
Compact Fluorescent 1: SK: Twin Tube 13W / Electronic	1	3	14	42
HID 5: S1: Metal Halide 50W / Standard	1	4	55	220
HID 6: SM: Metal Halide 100W / Standard	1	6	110	660
HID 7: SN: Metal Halide 50W / Standard	1	7	55	385
HID 8: SP: Metal Halide 32W / Standard	1	5	35	175
HID 9: SQ: Metal Halide 32W / Standard	1	4	35	140
HID 10: SR: Metal Halide 32W / Standard	1	4	35	140
Total Tradable Proposed Watts =				6754

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: Invalid exterior use quantity

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:

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

Exceptions:

Controlled by motion sensor or exempt from consideration under the provisions of Section 505.6.2.

Exterior Lighting TBD: Invalid exterior use quantity



Mechanical Compliance Certificate

2006 IECC

Section 1: Project Information

Project Type: **Addition**

Project Title : Community College of Philadelphia

Construction Site:

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Philadelphia, PA 19154

Owner/Agent:

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Designer/Contractor:

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27 Schoolhouse Road
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Section 2: General Information

Building Location (for weather data): **Philadelphia, Pennsylvania**

Climate Zone: **4a**

Heating Degree Days (base 65 degrees F): **4954**

Cooling Degree Days (base 50 degrees F): **3623**

Section 3: Mechanical Systems List

Quantity System Type & Description

14	HVAC System 1: Water Loop Heat Pump, Cooling Capacity ≥ 65 - < 90 kBtu/h, Water-Cooled Condenser / Single Zone
7	HVAC System 2: Water Loop Heat Pump, Cooling Capacity ≥ 54 - < 65 kBtu/h, Water-Cooled Condenser / Single Zone
35	HVAC System 3: Water Loop Heat Pump, Cooling Capacity < 54 kBtu/h, Water-Cooled Condenser / Single Zone
25	HVAC System 4: Heating: Radiant Heater, Hot Water / Single Zone w/ Perimeter System
1	Plant 1: Heating: Hot Water Boiler, Capacity < 300 kBtu/h, Gas, with Waterloop Heat Pump
1	Plant 2: Cooling: Condensing Unit, Capacity ≥ 135 kBtu/h, Condenser Water-Cooled, Standard Centrifugal Chiller: leaving chilled water temperature = 44.0 deg. F, entering condenser water temperature = 85.0, condenser flow rate = 3 gpm/ton, with Centrifugal Fan Cooling Tower

Section 4: Requirements Checklist

Requirements Specific To: HVAC System 1 :

- 1. Equipment minimum efficiency: Heat Pump: 4.2 COP, 12.0 EER
- 2. Heat pump thermostat required when supplemental electric resistance heat is installed
- 3. Loop temperature controlled with 20 degrees F deadband where neither cooling tower/fluid cooler nor boiler can operate
- 4. Open-circuit cooling tower has automatic bypass valve for condenser water loop
- 5. Open-circuit cooling tower with heat exchanger must have automatic shut-off controls for cooling tower
- 6. Two-position valve on each heat pump having total heat pump system power > 10 hp

Requirements Specific To: HVAC System 2 :

- 1. Equipment minimum efficiency: Heat Pump: 4.2 COP, 12.0 EER
- 2. Heat pump thermostat required when supplemental electric resistance heat is installed
- 3. Loop temperature controlled with 20 degrees F deadband where neither cooling tower/fluid cooler nor boiler can operate
- 4. Open-circuit cooling tower has automatic bypass valve for condenser water loop
- 5. Open-circuit cooling tower with heat exchanger must have automatic shut-off controls for cooling tower
- 6. Two-position valve on each heat pump having total heat pump system power > 10 hp

Requirements Specific To: HVAC System 3 :

- 1. Equipment minimum efficiency: Heat Pump: 4.2 COP, 12.0 EER
- 2. Heat pump thermostat required when supplemental electric resistance heat is installed
- 3. Loop temperature controlled with 20 degrees F deadband where neither cooling tower/fluid cooler nor boiler can operate
- 4. Open-circuit cooling tower has automatic bypass valve for condenser water loop
- 5. Open-circuit cooling tower with heat exchanger must have automatic shut-off controls for cooling tower
- 6. Two-position valve on each heat pump having total heat pump system power >10hp

Requirements Specific To: HVAC System 4 :

- 1. Balancing and pressure test connections on all hydronic terminal devices

Requirements Specific To: Plant 1 :

- 1. Newly purchased heating equipment meets the heating efficiency requirements
- 2. Loop temperature controlled with 20 degrees F deadband where neither cooling tower/fluid cooler nor boiler can operate
- 3. Two-position valve on each heat pump having total heat pump system power >10hp
- 4. Systems with multiple boilers have automatic controls capable of sequencing boiler operation

Requirements Specific To: Plant 2 :

- 1. Equipment minimum efficiency: Condensing Unit: 12.9 COP, 12.9 IPLV
- 2. Closed-circuit cooling tower has: a) automatic bypass valve for condenser water loop or b) dampers that shut-off air flow through the cooling tower
- 3. Open-circuit cooling tower has automatic bypass valve for condenser water loop
- 4. Open-circuit cooling tower with heat exchanger must have automatic shut-off controls for cooling tower
- 5. Cooling tower performance >20.0 gpm/hp
- 6. Air cooled condenser and cooling tower fan motors > 7.5 HP equipped with multiple-speed motors or single speed motors and variable speed drives

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. 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
- 6. Outside-air source for ventilation; system capable of reducing OSA to required minimum
- 7. 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
- 8. Mechanical fasteners and sealants used to connect ducts and air distribution equipment
- 9. Ducts sealed - longitudinal seams on rigid ducts; transverse seams on all ducts; UL 181A or 181B tapes and mastics
- 10. 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.
- 11. Operation and maintenance manual provided to building owner
- 12. Balancing devices provided in accordance with IMC (2006) 603.17
- 13. Motorized, automatic shutoff dampers required on exhaust and outdoor air supply openings
 - Exception: Gravity dampers acceptable in buildings <3 stories



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Mechanical Requirements Description

2006 IECC

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 Code and must meet the following minimum efficiency:
Heat Pump: 4.2 COP, 12.0 EER
2. Heat pumps having supplementary electric resistance heat must have controls that, except during defrost, prevent supplementary heat operation when the heat pump can meet the heating load.
3. Loop temperature controlled with 20 degrees F deadband where neither cooling tower/fluid cooler nor boiler can operate.
4. Open-circuit cooling tower has automatic bypass valve for condenser water loop.
5. Open-circuit cooling tower with heat exchanger must have automatic shut-off controls for cooling tower.
6. Two-position valves must be provided on each heat pump where the total heat pump system power is greater than 10 hp.

Requirements Specific To: HVAC System 2 :

1. The specified heating and/or cooling equipment is covered by the ASHRAE 90.1 Code and must meet the following minimum efficiency:
Heat Pump: 4.2 COP, 12.0 EER
2. Heat pumps having supplementary electric resistance heat must have controls that, except during defrost, prevent supplementary heat operation when the heat pump can meet the heating load.
3. Loop temperature controlled with 20 degrees F deadband where neither cooling tower/fluid cooler nor boiler can operate.
4. Open-circuit cooling tower has automatic bypass valve for condenser water loop.
5. Open-circuit cooling tower with heat exchanger must have automatic shut-off controls for cooling tower.
6. Two-position valves must be provided on each heat pump where the total heat pump system power is greater than 10 hp.

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:
Heat Pump: 4.2 COP, 12.0 EER
2. Heat pumps having supplementary electric resistance heat must have controls that, except during defrost, prevent supplementary heat operation when the heat pump can meet the heating load.
3. Loop temperature controlled with 20 degrees F deadband where neither cooling tower/fluid cooler nor boiler can operate.
4. Open-circuit cooling tower has automatic bypass valve for condenser water loop.
5. Open-circuit cooling tower with heat exchanger must have automatic shut-off controls for cooling tower.
6. Two-position valves must be provided on each heat pump where the total heat pump system power is greater than 10 hp.

Requirements Specific To: HVAC System 4 :

1. Hydronic heating and cooling coils must be equipped with a way to pressure test connections and measure and balance water flow and pressure.

Requirements Specific To: Plant 1 :

1. The specified heating equipment is covered by Federal minimum efficiency requirements. New equipment of this type can be assumed to meet or exceed ASHRAE 90.1 Code requirements for equipment efficiency.
2. Loop temperature controlled with 20 degrees F deadband where neither cooling tower/fluid cooler nor boiler can operate.
3. Two-position valves must be provided on each heat pump where the total heat pump system power is greater than 10 hp.
4. Systems with multiple boilers have automatic controls capable of sequencing the operation of the boilers.

Requirements Specific To: Plant 2 :

1. The specified heating and/or cooling equipment is covered by ASHRAE 90.1 Code and must meet the following minimum efficiency:
Condensing Unit: 12.9 COP, 12.9 IPLV
2. Closed-circuit cooling tower has either an automatic bypass valve for condenser water loop or dampers that shut-off air flow through the cooling tower.
3. Open-circuit cooling tower has automatic bypass valve for condenser water loop.
4. Open-circuit cooling tower with heat exchanger must have automatic shut-off controls for cooling tower.
5. New equipment of this type must have a performance rating of 20.0 gpm/hp in accordance with CTI ATC-105 and CTI STD-201.

6. Each fan motor of 7.5 hp or larger in a separate piece of heat rejection equipment must have the capability to operate that fan at two-thirds of full speed or less, and must have controls that automatically change the fan speed to control the leaving fluid temperature or condensing temperature/pressure of the heat rejection device.

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. 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, d) 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 (6,826 Btu/h) or less.
6. 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.
7. 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-5. 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 components (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.
8. 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.
9. 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.
10. 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.
11. 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.
12. Replaced with
13. 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.
14. 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: Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height above grade.
 - Exception: Ventilation systems serving unconditioned spaces.
15. Hydronic systems that use a common return system for both hot water and chilled water must not be used.