

Section 1: Project Information

Energy Code: 2009 IECC

Project Title: TD BANK HVAC UPGRADES

Project Type: Alteration

Construction Site: 481 Congress street, TD Bank Portland, Maine 04101

Owner/Agent: TD BANK BRANCH 481 CONGRESS STREET

Designer/Contractor: **PAUL CLEAVES** AIRTEMP INC 20 THOMAS DRIVE WESTBROOK, Maine 04092 207 774 2300 paul.cleaves@comfortsystemsusa.com

Section 2: General Information

Building Location (for weather data):

Portland, Maine

Climate Zone:

Section 3: Mechanical Systems List

Quantity System Type & Description

HVAC System (Multiple-Zone):

Heating: 1 each - Hydronic or Steam Coil, Steam, Capacity = 120 kBtu/h

No minimum efficiency requirement applies

Cooling: 1 each - Field-Assembled DX System, Capacity = 144 kBtu/h, Air-Cooled Condenser, Air Economizer

Proposed Efficiency = 13.00 EER, Required Efficiency: 10.80 EER
Fan System: FAN SYSTEM 1 | basment and first floor -- Compliance (Brake HP method): Passes

FAN 1 Supply, Multi-Zone VAV, 5000 CFM, 5.0 motor nameplate hp, 3.6 design brake hp (3.6 max. BHP)

Section 4: Requirements Checklist

Requirements Specific To: HVAC System:

	1.	Equipment minimum efficiency: Single Package Unit: 10.80 EER							
$\overline{\Box}$	2.	Specified equipment consists of field-assembled components - efficiency documentation provided							
	3. Minimum one temperature control device per zone								
	4. Balancing and pressure test connections on all hydronic terminal devices								
	5. Integrated economizer is required for this location and system.								
	6. Cooling system provides a means to relieve excess outdoor air during economizer operation.								
7. Systems serving more than one zone must be VAV systems									
	8.	Single-duct VAV terminals reduce primary air before reheating							
		Controls capable of resetting supply air temp (SAT) by 25% of SAT-room temp difference							
		Exception(s):							
$\bar{\Box}$		Systems that prevent reheating, recooling or mixing of heated and cooled supply air							
		Seventy five percent of the energy for reheating is from site-recovered or site solar energy sources.							
		Zones with peak supply air quantities of 300 cfm (142 L/s) or less.							
	10	0. Hot gas bypass prohibited unless system has multiple steps of unloading or continuous capacity modulation							
	11	.Hot gas bypass limited to 50% of total cooling capacity							
	12	NAV 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.							

Project Title: TD BANK HVAC UPGRADES Report date: 11/16/17 Data filename: Page 6 of 8

		Exception(s):						
		Systems with DDC of individual zone boxes reporting to the central control panel and reset of static pressure setpoint based the zone requiring the most pressure.	d on					
	13	Systems with DDC of individual zone boxes reporting to the central control panel has static pressure setpoint reset based on the requiring the most pressure.	zone					
	14	4. Hot water pumping systems with multiple boilers automatically reduce hot water flow rates proportionately when boilers are not operating						
	G	eneric Requirements: Must be met by all systems to which the requirement is applicable:						
	1.	Plant equipment and system capacity no greater than needed to meet loads Exception(s):						
		☐ Standby equipment automatically off when primary system is operating						
		Multiple units controlled to sequence operation as a function of load Minimum one temperature control device per system						
		Minimum one humidity control device per installed humidification/dehumidification system Load calculations per ASHRAE/ACCA Standard 183.						
_	5.	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup Exception(s):						
		Continuously operating zones						
_		Outside-air source for ventilation; system capable of reducing OSA to required minimum						
	1.	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(s):						
		☐ Ducts located within equipment						
		☐ Ducts with interior and exterior temperature difference not exceeding 15°F.						
		Mechanical fasteners and sealants used to connect ducts and air distribution equipment						
_		Ducts sealed - longitudinal seams on rigid ducts; transverse seams on all ducts; UL 181A or 181B tapes and mastics D.Hot water pipe insulation: 1.5 in. for pipes <=1.5 in. and 2 in. for pipes >1.5 in.						
		Chilled water/refrigerant/brine pipe insulation: 1.5 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 55 and 105°F.						
		Fluid not heated or cooled with renewable energy.						
		Piping within room fan-coil (with AHRI440 rating) and unit ventilators (with AHRI840 rating).						
		Runouts <4 ft in length.						
	12	. Operation and maintenance manual provided to building owner t. Thermostatic controls have 5°F deadband Exception(s):						
		☐ 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 author having jurisdiction.	ority					
		.Balancing devices provided in accordance with IMC 603.17						
		.Demand control ventilation (DCV) present for high design occupancy areas (>40 person/1000 ft2 in spaces >500 ft2) and served be systems with any one of 1) an air-side economizer, 2) automatic modulating control of the outdoor air damper, or 3) a design outding 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.						
コ		☐ Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1200 cfm. Motorized, automatic shutoff dampers required on exhaust and outdoor air supply openings Exception(s):						
		Gravity dampers acceptable in buildings <3 stories						
		Automatic controls for freeze protection systems present						
		Three-pipe systems not used Exhaust air heat recovery included for exercises 5 000 of the proportion with more than 70% outside air fraction and a sife all a second to the second to t	د.					
18.Exhaust air heat recovery included for systems 5,000 cfm or greater with more than 70% outside air fraction or specific Exception(s):								

Project Title: TD BANK HVAC UPGRADES Data filename:

	above _l	oost construction requirements h	nave been comple	eted.					
	Writt	en HVAC balancing and operation	ons report provide	ed to the owner.					
		HVAC O&M documents for all mechanical equipment and system provided to the owner by the mechanical contractor.							
	HVAC record drawings of the actual installation, system capacities, calibration information, and performance data for each equipme provided to the owner.								
Se	ectio	n 6: Post Constru	uction Co	mpliance Stateı	ment				
<u> </u> Na	7 <i>qu/</i> me - Tit	Cleaves / Des	ngn Eny.	Signature	11/16/17 Date				
spe to m	cificatio	ns and other calculations submi	tted with this pern	nit application. The proposed	ocument is consistent with the building plans mechanical alteration project has been desig he mandatory requirements in the Requireme	ıned			
Se	ectio	n 5: Compliance	Statemer	nt					
Laboratory fume hood exhaust systems that have either a variable air volume system capable of reducing exhaust and ma volume to 50 percent or less of design values or, a separate make up air supply meeting the following makeup air requirer a) at least 75 percent of exhaust flow rate, b) heated to no more than 2°F below room setpoint temperature, c) cooled to no than 3°F above room setpoint temperature, d) no humidification added, e) no simultaneous heating and cooling.									
		Systems requiring dehumidification that employ energy recovery in series with the cooling coil.							
		Cooling systems in climates w							
	☐ Heating systems in climates with less than 3600 HDD.								
		Where more than 60 percent of	of the outdoor hea	ting energy is provided from	energy is provided from site-recovered or site solar energy.				
		Systems serving spaces that are heated and not cooled to less than 60°F.							
		systems that the International Mechanical Co	de						

Project Title: TD BANK HVAC UPGRADES Data filename: Report date: 11/16/17 Page 8 of 8