

## DESIGN GUIDELINES SECTION 15700 HVAC

### New Construction and Renovations

	Preferred	Not-Preferred
<b>Cooling</b>		
methodology	Water cooled chillers	Air cooled chillers; direct expansion; water-source heat pumps
<b>Chiller Plants</b>		
Configurations	Variable volume primary or primary/variable volume secondary with chiller isolation gate valves and check valve in decoupler line; at least 2 chillers if possible.	Primary/constant volume secondary; Primary/variable volume secondary without isolation valves and decoupler line check valve. Butterfly valves are not acceptable for isolation.
Control	Per DCPS EMCS Guidelines and by the pre-approved EMCS providers.	Chiller plant control panels from chiller manufacturers are not acceptable.
Refrigerant monitoring	Per ASHRAE; status tied to EMCS	other
<b>Water-Cooled Chillers</b>		
Manufacturer	Trane, York, Carrier (must provide DCPS with software key and cables)	others
Type	Centrifugal, screw, scroll (2 or more separate refrigerant circuits for screw and scroll if available)	Reciprocating compressors; multi-compressor, single refrigeration circuit.
Refrigerant	R134A	R22, R123, R11, others
Control	Per DCPS EMCS Guidelines	other
Efficiency	Per ASHRAE 90.1 recommendation	other
Warranty	From date of project substantial completion (not from chiller start up); 1 year parts and labor on entire chiller plus 4 addnl years on compressors (excl labor)	other
<b>Cooling Towers</b>		
Manufacturer	Evapco, Marley	Others
Type	Dual cell, common sump with provisions for cell sump isolation during maintenance.	Other
Construction	Stainless steel	Other
Make-up water	Well with city backup; city water with separate meter	Well with no backup; city only with no separate meter
Fan Motor	Variable speed; belt drive; premium inverter rated.	2 speed; single speed; direct drive
Configuration	Counter flow or cross flow;	Internal motor

	external motor; dual access ladders or service platform; service access panels; drain at bottom of pan; welded seams.	
Control	Per DCPS EMCS Guidelines	other
Fan	Adjustable pitch, heavy duty, extruded aluminum, axial flow; heavy-duty, re-lubricatable ball bearings rated at 100,000 hours.	other
<b>Air-cooled chillers</b> Not allowed on new construction within 5 miles of the coast.		
Manufacturer	Trane, York, Carrier (must provide DCPS with software key and cables)	others
Type	Screw, scroll (2 separate refrigerant circuits if available)	Reciprocating, Centrifugal
Refrigerant	R134A	R22, R123, R11, others
Efficiency	Per ASHRAE 90.1 recommendation	other
Sound criteria	Sound pressure for combined 8 octave bands must be less than 75.0 dBA at 60 Hz from 30 feet from side of chiller; must be field verified post construction.	For replacement chillers, sound pressure can be equal to or less than pre-replacement, field verified levels for existing chiller; must be field verified post replacement.
Warranty	From date of project substantial completion (not from chiller start up); 1 year parts and labor on entire chiller plus 4 addnl years on compressors (excl labor)	other
Equipment Yard	Concrete slab	Gravel
Control	Per DCPS EMCS Guidelines	other
Condenser coils	Factory-applied, sea coast coated within 5 miles of the coast (replacement chillers only)	Adsil
<b>Watersource Heat Pumps</b>		
Manufacturer	Florida Heat Pump, Fredericks	others
Control	Per DCPS EMCS Guidelines	other
efficiency	> or = 13.0 EER or 16.0 SEER	< 13.0 EER; < 16.0 SEER
<b>DX RTUs, Split Systems, Wallhungs</b>		
type	Heat Pump	Cooling Only
Manufacturer	Trane, Carrier, York/JCI, AAON, Bard, Marvaire	others
controls	Occupancy sensor with night	Time clock, standalone programmable

	setback thermostat; per DCPS EMCS guidelines	or non-programmable thermostat
efficiency	> or = 13.0 EER or 16.0 SEER	< 13.0 EER; < 16.0 SEER
<b>Cooling for Server Rooms, IT Areas</b>		
type	Dedicated split system, minisplit, and ductless minisplit; cooling only, mounted at adjacent room location as to not allow for condensate piping to be located within room. Fire sprinkler heads to be <u>Double Interlock Pre Action System</u>	Primary building AC system only; heat pumps
controls	Dedicated thermostat mounted on wall; set at 78 degrees F so primary building AC acts as first stage cooling; temperature sensor in room tied to EMCS for alarms	remote controlled thermostats; setpoints below 78 degrees F
manufacturer	Mitsubishi, Fujitsu, LG, Daikin, Sanyo, Carrier	others
<b>Heating</b>		
methodology	electric	Hot water; (no 2-pipe systems allowed)
Control	Per DCPS EMCS Guidelines	other
<b>Water Piping</b>		
material	Mains above ground – black iron, sched 40 Mains below ground – black iron, sched 80 Branch lines – black iron sched 40 or hard drawn copper type L Condensate lines – CPVC sched 40	PVC, soft drawn copper tubing
insulation	Foamglas or rigid phenolic on all fixed piping; flexible 2" on all serviceable components	fiberglass
installation	Glued with mastic on joints	taped
Expansion tanks	Bladder type	Non-bladder type
<b>Pumps</b>		
Manufacturer	B&G, Aurora, TACO	Others
Type	Single, horizontal	Duplex, dual volute, vertical
configuration	For multiple pump applications, check valve for each pump	other
Control	Variable volume; per DCPS EMCS Guidelines	Constant volume
electrical	Combination starter/disconnect	Separate starter and disconnect
shaft	Stainless steel	other
installation	6" concrete pad with vibration	other

	isolation	
<b>Air Distribution Methodology</b>		
Primary air	Traditional VAV, dual duct VAV, AHU with VFD/ECM per classroom; fcu with VFD/ECM per classroom	Multizone; UVs; fcus w/ CV fan; DX VAV not allowed
Control	Per DCPS EMCS Guidelines	other
Outdoor air/Ventilation	For traditional VAV – outdoor air ducted to classroom; outdoor air ducted to AHU	Energy Recovery Units
<b>Air Handling Units</b>		
Manufacturer	Trane, York, Carrier	others
Filter	Standard 2”	Other
construction	2” double wall; foam insulation	single wall; fiberglass insulation
Auxiliary condensate pan and drain line	16 gauge galvanized, water tight auxiliary drain pan with float switch to disable unit; drain line pitched properly with P-trap	Condensate pumps
Access panels	Hinged and removable	other
Control	Per DCPS EMCS Guidelines	other
motor	High-efficiency, VFD rated > 5 hp – twin sheave, belt driven > 20 hp – 3 sheave, belt driven	Standard efficiency Single sheave for larger motors
<b>VAV boxes, fcus</b>		
Manufacturer	Envirotech, Trane, Magic Air, American Air Filter, Titus	others
Access panels	Access panel for all serviceable parts	other
Control	Per DCPS EMCS Guidelines	other
<b>In classroom, cabinet type AHU</b>		
Manufacturer	Change Air, School Air, Temspec	others
Control	Per DCPS EMCS Guidelines	other
configuration	Outdoor air fan, damper and chw coil; primary air fan with VFD or ECM and chw coil	Units without separate outdoor air fan, dampers or coils
<b>Locker Room AHU</b>		
Supply air source	From adjacent conditioned gymnasium with exhaust control synchronized with gym AHU outdoor air intake to prevent negative pressurization	100% outdoor air
control	Occupancy sensor with night setback thermostat; per DCPS EMCS Guidelines	EMCS scheduled
<b>Ductwork</b>		

Insulation location	outside	Inside
material	Galvanized metal; flex up to 8 ft in length; per SMACNA or ASHRAE	Ductboard; fiberglass ductwork
fasteners	Per SMACNA or ASHRAE	others
Return	ducted	Plenum return not allowed
<b>Mechanical Rooms</b>		
Temperature control	conditioned	Not conditioned
Clearances	Per equipment manufacturer	other
Floor drain	Lowest point	Other
<b>Exhaust Fans (excl. kitchens)</b>		
control	Tied to associated AHU through EMCS; occupancy sensor; per DCPS EMCS Guidelines	Manual
location	Wall; ASHRAE recommended distance from outdoor air intake	Roof
Type	Direct driven	Belt driven
<b>Variable Frequency Drives</b>		
Manufacturer	ABB, Danfoss, Yaskawa, JCI, Eaton, Toshiba, with manual bypass	others
<b>Energy Conservation</b>		
Target operation	< or = 10 kwh/sqft/yr < or = 75 kbtu/sqft/yr	> 10 kwh/sqft/yr > 75 kbtu/sqft/yr
Design	Per latest Florida Energy Code; LEED certification	other
Air treatment	Air purification (Bioclimatic-type)	Heat exchanger, heat wheels, energy recovery unit; Plasma Air
<b>Water Treatment</b>		
method	Chemical; Non-Chemical PulsePure, Dolphin WaterCare	others
<b>Air Diffusers</b>		
Supply air	Multi-directional; adjustable	others
<b>Filtration</b>		
size	2" pleated, standard dimensions	< 2", non-standard dimensions
location	Accessible	Inaccessible
<b>Service Ladders for Equipment Mezzanines</b>		
type	Ships ladder; staircase	Vertical