**PLUMBING DESIGN CRITERIA**

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| **Revision History** |
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# GENERAL

* 1. The Design Professional shall use this document in conjunction with the Educational Specifications and District Master Specifications (DMS) to develop the design and contract documents.
	2. Goals: To present additional requirements for the design of a functional, efficient and code compliant plumbing system that promotes a safe and sanitary environment for the students, employees and visitors of School District of Pinellas County Facilities.
	3. This division contains requirements for the following elements:
1. Piping Systems
2. Plumbing Components
3. Specific Rooms
4. Mechanical Equipment
	1. In this document, the term Engineer represents the professionally qualified Design Engineer of Record and/or Engineering Consultant, duly licensed in the State of Florida, that signs and seals project design documents.
	2. The Engineer is the person responsible for the design and development of all project documents.
	3. The Engineer must request, in advance and in writing, deviations from the Plumbing requirements in this document.
5. The PCSB shall review the requested deviations; based on good engineering practices and/or economics, and either approve or deny the request in writing.
6. Any approved deviations are valid only for the specific request.
	1. This document presents design requirements for the School District of Pinellas County that are either more stringent than or not present in the building codes. For items not presented in this document the requirements of the following codes shall apply:
7. Florida Building Code, FBC
8. National Fire Code, NFC
9. Florida Administrative Code, FAC
10. Americans with Disabilities Act Accessibility Guidelines, ADAAG
11. Advanced Energy Design Guide for K12 School Buildings
	1. Submittal requirements as listed in procedure BD-001 – Submission for Project Documents.
	2. The criteria shall not limit or restrain the performance and liability of the professional or professionals responsible for the integrity and performance of the structure.
	3. The criteria is applicable to new construction and to the remodeling and renovation of existing facilities.
	4. The use of the criteria in this document does not exempt the design professionals from any federal or state code or standards controlling the design and construction of any facility.

# II. CRITERIA

## Piping Systems

### Domestic Water System:

* 1. Provide potable water stub outs for future portable classroom installation.
	2. Schools designed as Enhanced Hurricane Protection Areas (EHPA):
1. Provide a plumbing system capable of supplying water for the capacity of the EHPA.
2. If pumps are required in the design, provide power from an emergency power source.
3. System to have automatic and manual controls.
	1. Provide cold water only at sinks located in student restrooms.

### Sanitary Drainage System

Schools designed as (EHPA):

* + 1. Provide a plumbing system capable of collecting sanitary waste for the capacity of the EHPA.
		2. If pumps are required in the design, provide power from an emergency power source.

The design professional is encouraged to utilize passive storage capacity of EHPA system to reduce the power requirements on the emergency generator capacity.

* + - * 1. Increase lift station capacity
				2. Use of line capacity
				3. Combination of two

## Plumbing Components

### Large Demand Water Heaters (Kitchens and Gymnasiums)

* 1. Locate water heater rooms (WHR) on exterior walls with exterior doors. Provide fire-rated WHR, coordinate with architect
		1. Use natural gas condensing water heaters, minimum 95% efficiency, if natural gas is not available, use propane gas. Provide electronic ignition. For any Gas regulators- Per CSD-1 CF 190 (d) Gas vent, bleed, or relief lines shall have provisions to be piped by the installer to the outdoors at a safe point of discharge a means shall be provided at the terminal point to prevent stoppage of the lines by foreign material, moisture or insects.
	2. Provide a system in accordance with the results of the water heater life cycle cost analysis (LCCA) performed by the engineer of record.
	3. Provide floor drain for the WHR.

### Small Demand Water Heaters

* 1. Use electric water heaters.
	2. Do not place these water heaters on the BAS.
	3. Provide a floor drain for the WHR for water heaters larger than 40-gallon capacity.

### Hose Bibs on Building Exterior Walls

* 1. Provide hose bibs at a maximum interval of 150' of exterior wall.
	2. Provide hose bibs with the following features: satin bronze finish, tamper proof vacuum breaker with hose end connection and control key operator.
	3. Provide a shutoff valve to isolate the water supply for that hose bib.

### Hose Bibs on Building Interior

* 1. Provide hose bibs in all group toilet rooms, art rooms and patios, kiln rooms, and mechanical equipment rooms.
	2. Provide hose bibs with the following features: satin bronze finish, tamper proof vacuum breaker with hose end connection and control key operator.
	3. Provide a shutoff valve to isolate the water supply for that hose bib.

### Shutoff Valve to Isolate the Water Supply

1. Locate the shutoff valve above a suspended grid ceiling in that area.
2. If no suspended grid ceiling, provide a 24" x 24" hinged ceiling access panel.
3. Place a 1/2" green sticker on the ceiling grid or access panel.
4. Coordinate with architect.

### Pipe

* 1. Above and below grade piping within 5’ of the building envelope shall be in accordance with Plumbing Master Specification 22 10 00 Plumbing Piping.
	2. Above and below grade piping outside 5’ of the building envelope shall be in accordance with Civil Master Specification: 33 11 00 Water Distribution Systems, 33 40 00 Storm Drainage Utilities, 33 30 00 Sanitary Sewer Utilities. (Also, see Civil Design Criteria).

### Sanitary Sewers

* 1. DR-18 PVC pipe – 6” and larger.
	2. Sch. 40 PVC pipe – 4” and smaller.
	3. PVC, DWV, solvent weld fittings shall be use 4” and smaller pipe.
	4. Saddle tees (any style) are prohibited.
	5. The use of sanitary crosses is prohibited.

### Domestic Water Mains

* 1. Sch. 40 all plastic male adapter fittings are prohibited, sch. 80 acceptable.
	2. Plastic female adapter fittings are prohibited.
	3. Stainless steel tapping sleeves (no saddles) shall be used to tap existing mains.

### Domestic Water Lines

* 1. FlowGuard Gold CPVC – 2” and smaller (refer to complete CPVC spec).
	2. Type “L” domestic hard copper pipe, above slab – 2 ½ and larger.
	3. Type “K” domestic soft copper tube, below slab.
	4. Viega ProPress fittings are acceptable.
	5. Compression couplings (slip nut style dresser couplings) are prohibited.

### Compressed Air Lines

* 1. Schedule 40 domestic galvanized pipe.
	2. Banded style treaded galvanized fittings shall be used.
	3. Smooth style couplings, as furnished with galvanized pipe, are prohibited.
	4. Close nipples are prohibited.
	5. Tee fittings for laterals on overhead mains shall be installed with the outlet vertical.

### Shut-off Valves

* 1. Full port ¼ turn ball valves, with S/S ball, Teflon seals – 3” and smaller.
	2. Gate valves may be used on 4” and larger.
	3. All exterior ball valves shall have S/S handles.
	4. Water main gate valves shall be resilient wedge, flanged or restrained joint.
	5. Globe style valves may be used to control individual fixtures only.
	6. Butterfly valves are prohibited on potable water.
	7. Plastic body valves are prohibited.

### Backflow Devices

* 1. RP, double check, detector check and spill-proof V/B shall be supplied as an assembly complete with shut off valves from the manufacturer.
	2. Backflow assemblies shall be installed a minimum of 12” above grade, and no higher than 60” above grade.
	3. Backflow assemblies shall be tested for proper operation by a certified tester (FBPR/AWWA approved) at completion of project and one week prior to expiration of warranty.

### Roof and Floor Drains

* 1. Iron body drains, no plastic
	2. “No Hub” connections
	3. Connect with heavy duty 4 clamp “No Hub” band
	4. Floor drains, minimum size, 3” (shower stall 2”)
	5. Roof drains, minimum size, 4”

### Hangers and Supports

* 1. Roof drains, hanger must be with-in 12” of elbow at base of drain.
	2. Copper stub outs on CPVC water systems must be rigidly supported.
	3. Plastic or metal rolls “plumbers’ strap” is prohibited.

### Water Closets and Urinals

* 1. Kohler or American Standard fixtures
	2. Flushometers shall be Sloan “Royal” series.
	3. All flushometers tailpieces shall be installed with stand-off brackets.
	4. Water closet seats shall have S/S post and self-sustaining hinges.
	5. PVC closet flanges shall have S/S bolt ring.
	6. Knock-out plug on knock-out style flanges must be retained for inspector.

### Lavatories

* 1. Kohler or American Standard fixtures.
	2. Zurn faucets
	3. Wall hung lavatories to be vitreous china.

### Sinks

All counter top mounted sinks, shall be 18 gauge, fully under coated S/S.

### Water Coolers – Chilled Water

* 1. All water cooler to be all S/S, ADA compliant, vandal resistant mold.
	2. One cooler at each facility shall bottle filler style, ADA, vandal resistant.
	3. Molded stone or S/S drinking fountains with remote chiller are acceptable, chiller must be located with-in 6’ developed length of fountain.

### Laundry Equipment

* 1. Washing machine boxes for residential washers shall have built-in air hammer arresters.
	2. All washing machines shall drain into an approved lint interceptor.

### Kitchen Equipment

* 1. All kitchen equipment and sinks shall be indirectly wasted.
	2. Automatic ice makers/machines shall have air hammer arrester install at control stop.

### Cleanouts

* 1. Two-way style cleanout fittings shall be on inlet and outlet of all grease traps and interceptors
	2. All ground lever cleanout covers shall be protected with concrete pad, direction of flow shall be permanently marked on concrete pad.

### Traps and Interceptors

The sanitary sewer system shall be protected by means of the following traps of interceptors as required by the Building Official. Grease, oil, acid, lint, solids, sand or hair.

### Trenches

All piping shall be properly bedded in dry trenches (see DEWATERING & BEDDING).

### Test and inspections

* 1. DWV, smoke test
	2. Sanitary sewer, video inspection

### Prohibited Products

* 1. Air admittance valves – use and location must be per-approved by District Building Official.
	2. Sch. 40 PVC male adapters (sch. 80, acceptable).
	3. Saddle tees (tapping sleeves on water mains expectable).
	4. Two clamp “No Hub” bands.
	5. Compression couplings (slip nut style dresser couplings).

### Prohibited Procedures

* 1. Drywells shall not be used for waste from condensate, drinking fountains or water softener regeneration.
	2. Horizontal waste arms serving urinals
	3. Water softener brine tanks located with-in 10’ of water heater or boiler (locate brine tank outside if possible).

## Specific Rooms

### Group Toilet Room

* 1. Provide one hose bib in each group toilet room located under the lavatories 12" AFF. With satin chrome plated finish, tamper proof vacuum breaker with hose end connection and control key operation.
	2. Provide wall-hung water closets, urinals, and lavatories with carrier.
	3. Provide 3" floor drain with trap primer installed on the lavatory tailpiece.
	4. Provide a shutoff valve for each toilet group to isolate the water supply for that group.
	5. Provide cold water to lavatories.
	6. Provide shock absorbers (not air chambers) in an accessible location.
		1. If not possible, provide a 24" x 24" hinged wall (ceiling) access panel.
		2. Coordinate with architect.
	7. Provide low flow urinals (0.5 per flush).
	8. Provide electric hand dryers.

### Single Toilet Rooms

* 1. Provide floor mounted water closet and wall hung lavatory.
	2. Floor drain is not required.
	3. Provide a shutoff valve for each single toilet room to isolate the water supply for that room.
	4. Provide cold water to lavatory.
	5. Provide shock absorbers (not air chambers) in an accessible location.
		1. If not possible, provide a 24” x 24” hinged wall (ceiling) access panel.
		2. Coordinate with architect.

### Single Baths and Showers

* 1. Provide pressure and temperature control valves for tubs and showers.
	2. Provide trap primer from lavatory tailpiece to tubs and showers.

### Group Showers

Locate the master shutoff valve and temperature control valve in the teacher planning room.

### Kitchens

* 1. Use natural gas for cooking if natural gas is not available use propane gas.
	2. Size the gas water heater based on the thermostat set point of 140 F.

* 1. Provide an electric booster heater to the dishwasher to provide 180 F water. First 10’ of drainage line receiving discharge from dishwasher shall be cast iron.
	2. Interlock the natural gas solenoid valve to the kitchen hood exhaust requiring the exhaust hood to be in operation before the gas will flow.

### Custodial Closets

* 1. Provide floor mounted service sink with CW and HW:

3” grid strainer and drain

* 1. Provide faucet with tamper proof vacuum breaker, pail hook, wall brace, ¾” hose thread outlet and integral stops.
	2. Provide a floor drain for the WHR for water heaters larger than 40-gallon capacity.

### Custodial Room/Central Receiving

1. Provide a Single toilet room with shower.
2. Provide floor drains with trap primers.
3. Provide an eyewash station/safety shower.

### Chemistry Laboratory - Gas System

* 1. Refer to the prototype Science Room in the Ed Specs for additional requirements and location.
	2. The main supply line to the classroom shall have a 24 VDC, normally closed solenoid valve with manual reset. The solenoid valve shall close on a signal from the fire alarm system.
	3. Provide a push-pull mushroom head emergency button at the classroom exit.
		1. When the emergency button is pushed, the solenoid valve shall close,
		2. Shut off the compressed air and electrical power to the classroom, and
		3. Start the emergency exhaust system.
	4. Route the main supply line from the solenoid valve to the teacher demo table.
	5. Route the main supply line from the teacher demo table, to the student stations.
		1. In a cabinet below the teacher demo table, provide a manual, quarter-turn master valve to control the gas supply to the student stations.
		2. The master valve shall be lockable in the closed position only.
	6. Pipe terminations to the teacher demo table and to each student station shall have gas cocks.
	7. Underground pipe shall be in a sleeve or installed in accessible chases. Vent the sleeve to the outside atmosphere.

### Chemistry Laboratory - Laboratory Drain System

* 1. Drainpipes shall be acid and chemical resistant from the lab drain to a neutralizing tank.
	2. Neutralizing tank shall be clearly and accurately identified on the as-builts.
	3. The tank shall be accessible through a manhole with the cover clearly marked, and if under payment shall be accessible without removing any payment.

### Science Chemistry Laboratory – Emergency Shower/Eye Wash

* 1. Locate near experimental tables but out of main student traffic flow out of classroom, coordinate with the Architect.
	2. Provide manual override shutoff above ceiling, mark locating on ceiling grid.
	3. Provide floor drain by the fixture.
	4. Design the system or space to minimize the spread of water and prevent damage to the classroom or furnishings.

### Administration

* 1. Production/Workroom:

Stainless steel double sink, with CW and HW

* 1. Clinic – See Board approved layout:
		1. One toilet room for elementary and two toilet rooms for secondary with the following:
			1. Wall mounted water closet, height appropriate for the school population.
			2. Lavatory, wall mounted, with CW and HW
			3. Accessible shower, with CW and HW
				1. Pressure and temperature compensating control valve
				2. 3" drain with satin finish Nikolay strainer and trap primer
				3. Fold down seat meeting accessibility requirements
		2. 22" x 22" Sink mounted in counter with gooseneck faucet, CW and HW.
			1. Swing-a-way eyewash connected with the sink
			2. Sink to meet accessibility requirements
	2. Staff Toilet:
		1. Wall mounted water closet
		2. Lavatory, wall hung, CW

### Art

* 1. Classroom:
		1. Two double sinks with clay traps, CW.
		2. Provide floor drain(s) with lift out sediment trap(s).
	2. Kiln:
		1. Utility sink, 3" drain with clay trap, CW, HW
		2. Provide floor drain with lift out sediment trap

### Pre-kindergarten and Kindergarten

* 1. Classroom:

Single sink, faucet, grid strainer, and blubber, CW

* 1. Toilet:
		1. Wall mounted water closet
		2. Lavatory with a faucet, CW

### Primary and Intermediate Classrooms

Single sink, with faucet and water jet fountain, CW

### Skills Development Laboratory (Science)

Student carrel with sink, faucet, CW

### Rooms containing clothes washing machines

* 1. Provide floor drain
	2. Provide HW and CW lines

## Mechanical Equipment

### Air-Cooled Chiller Yard

* 1. Provide a hose bib with the following features: satin bronze finish and tamper proof vacuum breaker with hose end connection.
	2. Provide cold water supply with RP backflow assembly to the chilled water make-up water system.
	3. Coordinate with mechanical engineer.

### Water-Cooled Chiller Plant

* 1. Provide a hose bib with the following features: satin bronze finish and tamper proof vacuum breaker with hose end connection.
	2. Provide RP backflow assembly protected cold water supply:
		1. To the chilled water make-up water system
		2. To the condenser water make-up water system
		3. Coordinate with mechanical engineer.
	3. Provide 3” floor drains with trap primers and vents, connected to sanitary system. Coordinate with architect to slope the floor to the floor drains.
	4. Provide 3” equipment drains with trap primers and vents connect to sanitary system, coordinate with mechanical engineer for proper location of the equipment drains next to the equipment.

### Air Handler Unit Rooms

* 1. Provide a hose bib with the following features: satin bronze finish and tamper proof vacuum breaker with hose end connection.
	2. Provide 3” floor drains with basket strainers, trap primers and vents, connected to sanitary system, coordinate with architect to slope the floor to the floor drains.
	3. Provide 3” condensate drain for each AHU with the following:
		1. Open hub drain with perforated stainless steel sediment basket.
		2. Install lip of condensate drain hub 1” above finished floor.
		3. Provide trap, but no trap vent or primer.
		4. Connect to storm water catch basin independent of the roof storm water system.
		5. If connected to roof storm water system, provide accessible backwater valve.
		6. Coordinate with mechanical engineer for proper location of condensate drain(s) next to AHU equipment pad(s).
	4. Condensate drainpipes from the air handler:
		1. Provide copper drainpipe full size of AHU connection.
		2. Provide a trap and a ¼” per foot pitch for positive gravity drainage; refer to DMS, Section 23 21 13.
		3. Provide a 1” air gap above the rim of an open hub drain for the AHU drainpipe.
		4. Condensate drainpipes shall be routed to storm drain system.
		5. Condensate drains shall not discharge to the ground, drywells are prohibited.

### Cooling Tower Enclosure

* 1. Provide a hose bib with the following features: satin bronze finish and tamper proof vacuum breaker with hose end connection.
	2. Provide cold water supply to the condenser water make-up system.
	3. Provide drain(s) for the cooling tower(s) emergency overflow(s) and drain valve(s).
	4. Provide 4” open hub drain(s) with perforated stainless steel sediment basket(s), trap primer(s), and vent(s) connected to sanitary system.
		1. Install lip of drain(s) 12” AFG
		2. Provide 1” air gap between the cooling tower discharge lines and drain; refer to DMS, Section 23 21 13.

END OF SECTION