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USACE / NAVFAC / AFCEA / NASA                      UFGS-40 42 13.26 40 (April 2006)  
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Preparing Activity:    NASA                      Superseding  
   NASA-15120S (December 2005)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are NOT in agreement with UMRL dated 01 April 2006

Revised throughout - changes not indicated by CHG tags

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## UNIFIED FACILITIES GUIDE SPECIFICATIONS

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### SECTION 40 42 13.26 40

#### PIPING SPECIALTIES 04/06

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NOTE: Delete, revise, or add to the text in this section to cover project requirements. Notes are for designer information and will not appear in the final project specification.

This section covers backflow preventers, backwater valves, water hammer arresters, wall hydrants, water filters, and water meters.

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

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## PART 1 GENERAL

### 1.1 REFERENCES

\*\*\*\*\*

NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's

Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WATER WORKS ASSOCIATION (AWWA)

|                |   |
|----------------|---|
| ANSI/AWWA C510 | (1997e2) Standard for Double Check Valve Backflow Prevention Assembly               |
| ANSI/AWWA C511 | (1997e1) Standard for Reduced-Pressure Principle Backflow Prevention Assembly       |
| ANSI/AWWA C700 | (2002; R 2003) Standard for Cold Water Meters - Displacement Type, Bronze Main Case |
| ANSI/AWWA C701 | (2002) Standard for Cold-Water Meters - Turbine Type for Customer Service           |

ASME INTERNATIONAL (ASME)

|               |  |
|---------------|--|
| ASME A112.1.2 | (2004) Standard for Air Gaps in Plumbing Systems (For Plumbing Fixtures and Water-Connected Receptors) |
|---------------|--|

PLUMBING AND DRAINAGE INSTITUTE (PDI)

|            |  |
|------------|--|
| PDI WH 201 | (1988; R 1992) Water Hammer Arrestors Standard |
|------------|--|

1.2 SUBMITTALS

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NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.] [for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

#### SD-03 Product Data

Manufacturer's catalog data shall be submitted for the following items:

Backflow Prevention Devices  
Backwater Valves  
Water-Hammer Arresters  
Wall Hydrants  
Water Filters  
Water Meters

#### SD-02 Shop Drawings

Installation drawings shall be submitted for the following items in accordance with paragraph entitled, "General Requirements," of this section.

Plumbing Specialties  
Equipment

Detail Drawings shall be submitted in accordance with paragraph entitled, "General Requirements," of this section.

#### SD-07 Certificates

Certificates shall be submitted for the following items showing conformance with the referenced standards contained in this section.

Backflow Prevention Devices  
Backwater Valves  
Water-Hammer Arresters  
Wall Hydrants

Water Filters  
Water Meters

1.3 GENERAL REQUIREMENTS

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NOTE: If Section 23 00 00.00 40 GENERAL MECHANICAL PROVISIONS is not included in the project specification, applicable requirements therefrom should be inserted and the following paragraph deleted.  
\*\*\*\*\*

Section 23 00 00.00 40 GENERAL MECHANICAL PROVISIONS applies to work specified in this section.

Detail Drawings shall be submitted for piping specialties consisting of fabrication and assembly drawings for all parts of the work in sufficient detail to enable the Government to check conformity with the requirements of the contract documents.

Installation drawings shall be submitted for Plumbing Specialties and Equipment in accordance with the manufacturer's recommended instructions and methods.

PART 2 PRODUCTS

2.1 BACKFLOW PREVENTION DEVICES (VACUUM BREAKERS)

\*\*\*\*\*  
NOTE: Delete paragraph title and following paragraphs when not applicable to the project.  
  
Revise or delete paragraphs as required by project conditions.  
\*\*\*\*\*

Backflow prevention devices, including airgaps, shall conform to the requirements of ASME A112.1.2, ANSI/AWWA C510 and ANSI/AWWA C511.

Airgaps conforming to ASME A112.1.2 shall be constructed of metal, ferrous or nonferrous.

Devices DN50 2-inch iron pipe size (ips) and smaller with moving components, including devices defined in ANSI/AWWA C510 and ANSI/AWWA C511, shall be constructed of nonferrous metals; nonmetal components of such devices shall be rated for the application service temperature.

Bodies for devices DN65 2-1/2 inches and larger shall be corrosion-resistant ferrous material or bronze, with flanged connections. Metallic operating components and trim shall be nonferrous. Nonmetallic parts shall be rated for the application service temperature.

External surfaces of devices used in conjunction with equipment with polished or chrome-plated surfaces shall be similarly finished.

External surfaces of devices may be rough castings where these devices are used outside of the building or in equipment rooms.

Devices shall be protected from freezing and shall be installed and used in strict conformance with the manufacturer's instructions.

Devices mounted outside of the building shall be vandalproof.

\*\*\*\*\*  
NOTE: Select Type BAG for cooling-water drains,  
refrigerator drains, etc.  
\*\*\*\*\*

#### 2.1.1 Type BAG

Type BAG backflow prevention device shall be an airgap casting of ferrous or nonferrous metal.

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NOTE: Select Type BAT for lawn sprinklers, vats,  
open tanks, hose bibbs, wall hydrants, x-ray tanks,  
dishwashers (modified for high temperature 212  
degree F) 100 degrees C), etc.  
\*\*\*\*\*

#### 2.1.2 Type BAT

Type BAT backflow prevention device shall be an atmospheric type for nonpressurized service. Operating device, when installed where very low flow may occur, shall be sufficiently sensitive to preclude spillage and slow leakage of water into surrounding area. BAT device shall be used only where no backpressure may occur.

\*\*\*\*\*  
NOTE: Select Type "BPT" to separate nonpotable  
water lines, including sprinkler systems.  
\*\*\*\*\*

#### 2.1.3 Type BPT

Type BPT backflow prevention device shall be a pressure type suitable for permanent duty under pressure but without possibility of exposure to backpressure. Operating device shall be spring-loaded. Unit shall consist of shutoffs upstream and downstream of vacuum breaker, one or two check valves, vacuum breaker, and test cocks.

\*\*\*\*\*  
NOTE: Select Type BDC unit to prevent connections  
through which nontoxic foreign material, such as  
steam, air, or other similar materials, may enter a  
potable line. Do not subject to backpressure or any  
device which may create a reversal of flow. Slight  
spillage may occur during testing.  
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#### 2.1.4 Type BDC

Type BDC backflow prevention device shall be a double check-valve pressure unit with shutoffs upstream and downstream of the check valves, and test cocks in the upstream side of the upstream shutoff and on each side of the check-valve internal closing device. Check-valve loading, swing or lift, shall be such that the valve will remain closed against 7 kilopascal

1-pound per square inch (psi) differential pressure with the higher pressure on the inlet side of the check valve. Lift type shall be very soft elastomer.

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**NOTE: Select Type BRP for continuous-pressure service where backpressure may occur, provided it is not sewage or toxic substance.**  
\*\*\*\*\*

#### 2.1.5 Type BRP

Type BRP reduced-pressure backflow prevention device shall be a standard commercial unit or shall be fabricated from stock parts. A prototype of the device shall be submitted to, and approved by, a test and checkout laboratory. Before acceptance for installation, shop drawings and a certificate of performance test of the operational characteristics shall be submitted to the Contracting Officer. Device shall consist of two or more tight-closing check valves, two shutoff valves, reduced-pressure regulating device, and the necessary appurtenances for testing.

\*\*\*\*\*  
**NOTE: Typical manufacturing sources include Beeco, CLA-VAL 3-inch DN80 ips.**  
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#### 2.2 BACKWATER VALVES

Backwater valves shall be inline type with automatically operating flapper valve and manually operated gate shutoff valve. Body and cover shall be cast iron; trim shall be bronze. Stem shall be nonrising with removable wheel.

Backwater valves at floor drains shall be automatic nonferrous or plastic ball type seating against elastomer seals.

#### 2.3 WATER-HAMMER ARRESTERS

Water-hammer arresters shall be commercially manufactured products consisting of bellows arranged to absorb the energy of pressure waves generated by valve closure in a line in which water is flowing. Arresters shall be nonferrous construction, shall be rated as to capacity, and shall be certified in accordance with PDI WH 201.

#### 2.4 WALL HYDRANTS

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**NOTE: Include "backflow preventers (vacuum breakers)" if the following paragraph is selected.**  
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Wall hydrants shall have brass wall-boxes with nozzles and detachable T-handles and shall be provided with vandalproof type BAT vacuum breakers. Exterior surfaces shall be chrome-plated.

#### 2.5 WATER FILTERS

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**NOTE: These filters are intended for photographic**

wash process to eliminate suspended matter only.

All piping downstream of filter shall be nonferrous and should be restricted to end-use unless costly but longer lasting prefilters are installed.

Rewrite paragraph as required by project conditions.

\*\*\*\*\*

Filter assembly shall be duplex with nonferrous 3-way ported ball valves on inlet and outlet sides for inservice filter selection. Metal parts that are wetted in service shall be brass, bronze or AISI Type 304 or 316 corrosion-resistant steel. Nonmetallic parts shall be ceramic, plastic, or fiber suitable for providing noncontaminating service with distilled or demineralized water. Filter shall be capable of retaining all particulate matter larger than 1 micrometer. Maximum pressure drop at maximum indicated flow rate with 50 percent dirty cartridge(s) shall not exceed 70 kilopascal 10 psi.

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NOTE: Retain following paragraph only where through-the-wall filter operation is required.

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Brass operating rod shall be provided within casings of zinc-coated steel pipe of sufficient length to extend through walls and as required to place valve inside the building.

## 2.6 WATER METERS

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NOTE: Select disk water meters for greater accuracy than turbine type in sizes up to 300 gallons per minute 18.9 liter per second.

AWWA permissible pressure drop exceeds that specified by 5 psi 34 kilopascal.

Where a meter essentially discharges to atmosphere, as with a tank level float-control, the drawings must show a flow-limiting or balancing valve of the memory type upstream or downstream of the meter.

Check drawings for inclusion of memory type balancing valves.

Meters in sizes 3 inches 80 millimeter and larger shall be supported from the floor by suitable pedestal or otherwise.

This specification does not provide for compound-or fire-service water meters.

\*\*\*\*\*

Positive displacement disk meters shall conform to ANSI/AWWA C700, except as modified by requirements specified herein. Parts wetted by water shall be bronze, rubber, or plastic. Casing shall be flanged in sizes 65 millimeter 2-1/2 inches and larger. Registers shall be magnetic drive, straight reading. Maximum pressure drop at maximum capacity shall not



exceed 70 kilopascal 10 psi for meters sized 80 millimeter 1-1/2 inches ips and smaller, 100 kilopascal 15 psi for meters 50 millimeter 2 inches ips and larger.

Turbine meters shall conform to ANSI/AWWA C701, except as modified by requirements specified herein. Casing shall be flanged. Register shall be magnetic drive, straight reading. Maximum pressure drop at maximum capacity shall not exceed 100 kilopascal 15 psi.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

Equipment shall be installed as indicated and specified in accordance with manufacturer's recommendations.

#### 3.2 WATER-HAMMER ARRESTERS

Water-hammer arresters shall be installed in accordance with the manufacturer's printed instructions and PDI WH 201.

-- End of Section --