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Preparing Activity:    NASA                              Superseding  
   UFGS-23 22 13.35 40 (April 2006)

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2008

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### SECTION 23 22 13.35 40

#### STEAM TRAPS 06/06

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NOTE: This specification covers the requirements  
for steam traps.

Drawings shall schedule the normal condensing rate  
for the service. Equipment and capacity safety  
factor shall be as specified hereinafter.

Drawings shall number each trap sequentially with  
the prefix ST.

Thermodynamic traps are not acceptable due to  
pressure limitations.

Edit this guide specification for project specific  
requirements by adding, deleting, or revising text.  
For bracketed items, choose applicable items(s) or  
insert appropriate information.

Remove information and requirements not required in  
respective project, whether or not brackets are  
present.

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).

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## PART 1    GENERAL

### 1.1    REFERENCES

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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.

ASTM INTERNATIONAL (ASTM)

ASTM A 105/A 105M	(2005) Standard Specification for Carbon Steel Forgings for Piping Applications
ASTM A 216/A 216M	(2007) Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service
ASTM A 278/A 278M	(2001; R 2006) Standard Specification for Gray Iron Castings for Pressure-Containing Parts for Temperatures Up to 650 degrees F (350 degrees C)

1.2 GENERAL REQUIREMENTS

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NOTE: If Section 23 00 00.00 40 HEATING, VENTILATING, AND AIR-CONDITIONING is not included in the project specification, applicable requirements therefrom should be inserted and the following paragraph deleted.

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Section 23 00 00.00 40 HEATING, VENTILATING, AND AIR-CONDITIONING applies to work specified in this section.

Manufacturer's Catalog Data shall be submitted for steam traps in accordance with referenced standards contained in this section.

Installation Drawings for steam traps shall be in accordance with the manufacturer's published instructions.

Listing of Product Installation shall be submitted for steam traps, indicating at least five installed units, similar to those proposed for use, that have been in successful service for a minimum of five years.

### 1.3 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 steam traps in accordance with paragraph entitled, "General Requirements," of this section.

#### SD-02 Shop Drawings

Installation Drawings shall be submitted for steam traps in accordance with paragraph entitled, "General Requirements," of this section.

#### SD-07 Certificates

Listing of Product Installation shall be submitted for steam trap assemblies in accordance with paragraph entitled, "General

Requirements," of this section.

Certificates shall be submitted for the following in accordance with paragraph entitled, "Materials," of this section.

Steam Traps  
Trap Bodies and Components

PART 2 PRODUCTS

2.1 MATERIALS

Traps exposed to weather shall be freezeproof.

Certificates shall be submitted for Steam Traps and Trap Bodies and Components showing conformance with the referenced standards contained in this section.

2.2 TRAP APPLICATION

<u>SERVICE</u>	<u>TRAP TYPE</u>
Steam mains, risers, branches	Type IB, inverted bucket with thermostatic air vent where necessary
Steam mains, risers, and branches, weather-exposed and subject to freezing	Refer to drawings
Steam coils associated with fans	Type F&T, float and thermostatic
Steam coils not associated with fans and not subject to freezing	Type T, thermostatic
Hot-water converter	Type F&T, float and thermostatic
Flash tank	Type IB, inverted bucket

2.3 TRAP-SIZING CRITERIA

Traps in steam mains, risers, and branches shall be sized to provide an actual capacity, under normal operating conditions, of not less than three times the normal condensing rate.

Traps draining underground steam mains shall be sized to provide an actual capacity, under normal operating conditions, of not less than four times the normal condensing rate.

Traps in steam mains, risers, and branches, weather-exposed and subject to freezing, shall be sized to provide an actual capacity, under normal operating conditions, of two times normal condensing rate and shall be duplexed. Two identical traps shall be provided, sized appropriately at each drainage point.

Traps draining steam coils under modulating control shall be sized to

provide an actual capacity, under conditions normal to the system and including 3.5 kilopascal 1/2-pound per square inch (psi) coil pressure, of two times normal condensing rate and shall be capable of opening at maximum coil steam pressure.

Traps in all other services shall be sized to provide an actual capacity, under normal operating conditions, of three times normal condensing rate.

Trap safety factors are minimal and shall be increased where necessary to ensure proper system drainage for a given application but shall not be decreased without written approval.

#### 2.4 TRAP TYPE, CONSTRUCTION, AND MATERIALS

Trap bodies and components shall have a primary working steam pressure (wsp)-rating equal to or in excess of the maximum wsp of the steam system to which applied.

Trap bodies for pressures 860 kilopascal 125-psi wsp and under shall be cast iron in accordance with ASTM A 278/A 278M, Class 30.

Welded end connection trap bodies shall be [cast steel in accordance with ASTM A 216/A 216M, Grade WCB] [forged carbon steel in accordance with ASTM A 105/A 105M].

Traps shall have permanent external identification of service rating and orifice size.

##### 2.4.1 Type IB

Inverted bucket traps shall have AISI 300 Series corrosion-resistant steel floats and operating mechanisms and hardened, 13 percent chrome corrosion-resistant steel seats and valves.

Thermostatic elements shall be bimetallic type.

Traps shall be designed to permit removal and replacement of all operating and wearing parts without disturbing piping connections to trap body.

Strainers shall be provided as an integral part of the body.

Bodies shall be provided with plugged priming and draining openings.

Test cocks shall be provided.

##### 2.4.2 Type F&T

Float and thermostatic traps shall have AISI 300 series corrosion-resistant steel, heliarc-welded floats and operating mechanisms, and hardened, 13 percent chrome corrosion-resistant steel seats and valves.

Thermostatic elements shall be balanced pressure type, with corrosion-resistant alloy bellows charged with a fluid that will provide most rapid response to changes in temperature.

Bellows shall be suitable for service with condensate having a pH of 6.0.

Traps shall be designed to permit removal and replacement of all operating and wearing parts without disturbing piping connections to trap body.

Bellows shall be designed to permit removal while hot without overexpansion and shall be shielded from direct blast of steam and condensate.

Bodies shall be fitted with drain plug.

#### 2.4.3 Type T

Thermostatic traps shall be balanced pressure type, with corrosion-resistant alloy bellows charged with a fluid that will provide most rapid response to change in temperature.

Bellows shall be suitable for service with a condensate having a pH of 6.0. Bellows shall be shielded from direct blast of steam and condensate and shall be designed to permit removal while hot without overexpansion.

Valves and valve seats shall be hardened, 13 percent chrome corrosion-resistant steel.

Traps shall be designed to permit removal and replacement of all operating and wearing parts without disturbing piping connections.

### PART 3 EXECUTION

#### 3.1 TRAP INSTALLATION

Traps shall be installed in accordance with the manufacturer's instructions.

#### 3.2 COMPONENT INSTALLATION

Trap components shall be installed in accordance with the manufacturer's instructions.

-- End of Section --