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USACE / NAVFAC / AFCEC / NASA	**UFGS-23 22 13.35 40 (February 2017)**

Preparing Activity: NASA	**Superseding**
	UFGS-23 22 13.35 40 (February 2014)
	UFGS-23 22 13.35 (May 2010)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2021

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SECTION 23 22 13.35 40

STEAM TRAPS

02/17

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SECTION 23 22 13.35 40

STEAM TRAPS
02/17

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NOTE: This guide specification covers the requirements for steam traps.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

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

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

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PART 1 GENERAL

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NOTE: If Section 23 30 00 HVAC AIR DISTRIBUTION is not included in the project specification, insert applicable requirements therefrom and delete the following paragraph.

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Section 23 30 00 HVAC AIR DISTRIBUTION applies to work specified in this section.

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NOTE: Show the schedule of normal condensing rate in the drawings. Specify the equipment and capacity safety factor. Number each trap sequentially with the prefix ST. Thermodynamic traps are not acceptable because of pressure limitations.

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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 Reference Identifier (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 A105/A105M	(2018) Standard Specification for Carbon Steel Forgings for Piping Applications
ASTM A216/A216M	(2016) Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service
ASTM A278/A278M	(2001; R 2020) Standard Specification for Gray Iron Castings for Pressure-Containing Parts for Temperatures Up to 650 degrees F (350 degrees C)

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, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a “G” to an item, if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets

following the "G" classification, with a code of up to three characters 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.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

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" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification 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; G[, [____]]

SD-02 Shop Drawings

Installation Drawings; G[, [____]]

SD-07 Certificates

List of Product Installations; G[, [____]]

Steam Traps; G[, [____]]

Trap Bodies and Components; G[, [____]]

1.3 QUALITY CONTROL

Submit a list of product installations for steam traps, indicating at least [five][_____] installed units, that are similar to those proposed for use and that have been in successful service for a minimum of [five][_____] years.

PART 2 PRODUCTS

Submit the manufacturer's catalog data for steam traps, showing conformance with referenced standards contained in this section.

2.1 EQUIPMENT

2.1.1 Trap Type And Construction

Provide trap bodies and components with primary wsp ratings equal to or in excess of the maximum wsp of the steam system to which they are applied.

Ensure that traps have permanent external identification of service indicating rating and orifice size.

Ensure that traps exposed to weather are freezeproof.

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NOTE: Select the applicable type of trap and delete those not used in project.
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[#### 2.1.1.1 Inverted Bucket (IB) Type

Provide IB-type traps with AISI 300 Series corrosion-resistant steel floats and operating mechanisms; and 13-percent chrome corrosion-resistant, hardened-steel seats and valves.

Provide bimetallic-type thermostatic elements.

Ensure that traps allow the removal and replacement of all operating and wearing parts, without disturbing piping connections to the trap body.

Provide strainers as an integral part of the body.

Provide bodies with plugged priming and draining openings.

Provide test cocks.

][#### 2.1.1.2 Float and Thermostatic (F&T) Type

Provide F&T-type traps with AISI 300 series corrosion-resistant steel, heliarc-welded floats and operating mechanisms; and 13-percent chrome, corrosion-resistant, hardened-steel seats and valves.

Provide a thermostatic, balanced-pressure type trap. Ensure that the trap has a corrosion-resistant alloy bellows charged with a fluid that responds rapidly to changes in temperature.

Ensure that the bellows is suitable for service with condensate having a pH of [6.0][_____].

Ensure that traps allow the removal and replacement of all operating and wearing parts, without disturbing piping connections to the trap body.

Fit trap bodies with drain plug.

][#### 2.1.1.3 Thermostatic Trap (T) Type

Provide a thermostatic, balanced-pressure type trap. Ensure that the trap has a corrosion-resistant alloy bellows charged with a fluid that responds rapidly to changes in temperature.

Ensure the bellows is suitable for service, with a condensate having a pH

of [6.0][_____]. Shield the bellows from condensate and direct blasts of steam.

Provide hardened valves and valve seats made of 13-percent chrome corrosion-resistant steel.

]2.2 MATERIALS

Submit certificates for steam traps and trap bodies and components, showing conformance with the referenced standards contained in this section.

Provide cast iron trap bodies for working steam pressures 860 kilopascal (wsp), 125-psi wsp or less in accordance with ASTM A278/A278M, Class 30.

Provide welded end-connection trap bodies of [cast steel, in accordance with ASTM A216/A216M, Grade WCB] [forged carbon steel, in accordance with ASTM A105/A105M].

PART 3 EXECUTION

3.1 INSTALLATION

Submit installation drawings for steam traps in accordance with the manufacturer's published instructions.

Install traps and trap components in accordance with the manufacturer's instructions.

For F&T-type traps, install the bellows to allow removal while hot without overexpansion. Shield the bellows from condensate and direct blasts of steam.

For T-type traps, install the bellows to allow the removal and replacement of all operating and wearing parts, without disturbing piping connections to the trap body.

3.1.1 Trap Application

SERVICE	TRAP TYPE
Steam mains, risers, branches	IB-Type, 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	F&T-Type, float and thermostatic
Steam coils not associated with fans and not subject to freezing	T-Type, thermostatic
Hot-water converter	F&T-Type, float and thermostatic
Flash tank	IB-Type, inverted bucket

3.1.2 Trap Sizing Criteria

Trap safety factors are minimal. Increase the following safety factors where necessary to ensure proper system drainage for a given application.

Do not decrease safety factors without written approval of the Contracting Officer.

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

Size traps that drain underground steam mains to provide an actual capacity, under normal operating conditions, of not less than four times the normal condensing rate.

Size traps in steam mains, risers, and branches that are weather-exposed and subject to freezing, to provide an actual capacity, under normal operating conditions, of two times the normal condensing rate. Provide two identical traps, sized appropriately at each drainage point.

Size traps used for draining steam coils under modulating control to (1) provide an actual capacity, under normal operating conditions and including 3.5 kilopascal 1/2 psi coil pressure, of two times the normal condensing rate and (2) to be capable of opening at maximum coil steam pressure.

Size traps for all other service conditions to provide an actual capacity, under normal operating conditions, of three times the normal condensing rate.

-- End of Section --