



National Aeronautics and
Space Administration

John C. Stennis Space Center
Stennis Space Center, MS
39529-6000

SSTD-8070-0070-PIPE Rev. Basic
JULY 2017

COMPLIANCE IS MANDATORY

John C. Stennis Space Center **PVC and HDPE Piping for Potable Water Service** **Underground**

Approved by:

Thom Rich
NASA SSC Center Operations
Design & Construction Project
Management Division

7/17/2017
Date

Concurrence by:

Bartt J. Hebert
NASA SSC Engineering & Test Directorate

7/27/2017
Date

Freddie Douglas
NASA SSC Safety & Mission Assurance

7/27/2017
Date

Issued by

ISSUED CEF
Central Engineering Files

7/27/2017
Date

This is an uncontrolled document when printed. Verify that the document is current before use.



Documents
Document Sharing Hub

Stennis Standard	SSTD-8070-0070-PIPE	Basic
	<i>Number</i>	<i>Rev.</i>
	Effective Date: July 28, 2017	
	Review Date: July 28, 2022	
	Page 2 of 18	
Responsible Office: NASA SSC Center Operations Directorate		
SUBJECT: PVC and HDPE Piping for Potable Water Service Underground		

Document History Log

Change/ Revision	Change Date	Originator/ Phone	Description
Basic	7.28.2017	Robert Hoyt, Ext. 1745	Initial release. This document supersedes SSC 47-050.

Stennis Standard	SSTD-8070-0070-PIPE	Basic
	<i>Number</i>	<i>Rev.</i>
	Effective Date: July 28, 2017	
	Review Date: July 28, 2022	
	Page 3 of 18	
Responsible Office: NASA SSC Center Operations Directorate		
SUBJECT: PVC and HDPE Piping for Potable Water Service Underground		

Table Of Contents

1.0	PURPOSE	4
2.0	APPLICABILITY.....	4
3.0	REFERENCES AND APPLICABLE DOCUMENTS	4
4.0	RESPONSIBILITIES	5
5.0	OPERATING CONDITIONS.....	5
6.0	REQUIREMENTS.....	5
6.1	General	5
6.2	Installation, Inspection, and Test Requirements	6
6.2.1	High-Density Polyethylene (HDPE) Potable Water Piping Systems.....	6
6.2.2	Polyvinyl Chloride (PVC) Potable Water Piping Systems	10
6.2.3	Connection to Existing System	13
6.2.4	Location of Water Lines.....	13
6.2.5	Buried Warning and Identification Tape.....	14
6.2.6	Tracer Wire	15
6.2.7	Valve Boxes	15
6.2.8	Valve Tags.....	16
6.2.9	Documentation of As-Built Condition	17
7.0	RECORDS AND FORMS.....	17
8.0	ACRONYMS	17

Stennis Standard	SSTD-8070-0070-PIPE	Basic
	<i>Number</i>	<i>Rev.</i>
	Effective Date: July 28, 2017	
	Review Date: July 28, 2022	
	Page 4 of 18	
Responsible Office: NASA SSC Center Operations Directorate		
SUBJECT: PVC and HDPE Piping for Potable Water Service Underground		

1.0 PURPOSE

This John C. Stennis Space Center (SSC) standard (SSTD) specifies the materials and procedures for the construction of polyvinyl chloride (PVC) and high-density polyethylene (HDPE) potable water piping systems at SSC. This SSTD is for installation below ground surface only.

2.0 APPLICABILITY

This standard shall be used for specifying materials and components to be incorporated into the PVC and HDPE potable water piping systems as designated on the SSC Site-wide Operational and Repair Documentation (SORD) Drawing System.

3.0 REFERENCES AND APPLICABLE DOCUMENTS

All references are assumed to be the latest version unless otherwise indicated.

ANSI/AWWA C110/A21.10, *Ductile-Iron and Gray-Iron Fittings*
ANSI/AWWA C111/A21.11, *Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings*
ANSI/AWWA C213, *Fusion-Bonded Epoxy Coatings and Linings for Steel Water Pipe and Fittings*
ANSI/AWWA C515, *Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service*
ANSI/AWWA C605, *Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings*
ANSI/AWWA C651, *Disinfecting Water Mains*
ANSI/AWWA C655, *Field Dechlorination*
ANSI/AWWA C900, *Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings 4 In. Through 12 In. (100 mm Through 300 mm), for Water Transmission and Distribution*
ANSI/AWWA C906, *Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. (11 mm through 1,650 mm) for Waterworks*
ASTM D2774, *Standard Practice for Underground Installation of Thermoplastic Pressure Piping*
ASTM D3139, *Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals*
ASTM D3261, *Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing*
ASTM D3350, *Standard Specification for Polyethylene Plastics Pipe and Fittings Materials*
ASTM F477, *Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe*
ASTM F1668, *Standard Guide for Construction Procedures for Buried Plastic Pipe*
ASTM F2164, *Standard Practice for Field Leak Testing of Polyethylene (PE) and Crosslinked Polyethylene (PEX) Pressure Piping Systems Using Hydrostatic Pressure*
ASTM F2206, *Standard Specification for Fabricated Fittings of Butt-Fused Polyethylene (PE)*

Stennis Standard	SSTD-8070-0070-PIPE	Basic
	<i>Number</i>	<i>Rev.</i>
	Effective Date: July 28, 2017	
	Review Date: July 28, 2022	
		Page 5 of 18
Responsible Office: NASA SSC Center Operations Directorate		
SUBJECT: PVC and HDPE Piping for Potable Water Service Underground		

ASTM F2620, *Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings*
 AWWA C509, *Resilient-Seated Gate Valves for Water Supply Service*
 AWWA C512, *Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service*
 AWWA C600, *Installation of Ductile Iron Water Mains and their Appurtenances*
 AWWA C905, *Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14-inch through 48 inch (350 mm through 1,200 mm) for Water Transmission and Distribution*
 AWWA M23, *PVC Pipe – Design and Installation*
 AWWA M55, *PE Pipe – Design and Installation*
 Mississippi Department of Health Recommended (MDH) Minimum Design Criteria for Mississippi Public Water Systems
 NFPA 24, *Installation of Private Fire Service Mains and Their Appurtenances*
 NFPA 25, *Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*
 PPI TN-42, *Recommended Minimum Training Guidelines for PE Pipe Butt Fusion Joining Operators for Municipal and Industrial Projects*
 SPR 1440.1, *SSC Records Management Program Requirements*
 SSTD-8070-0005-CONFIG, *SSC Preparation, Review, Approval, and Release of SSC Standards*
 UL 789, *Standard for Safety Indicator Posts for Fire-Protection Service*

4.0 RESPONSIBILITIES

- a. Users of this SSTD shall comply with its requirements, ensure use of the correct version of this SSTD and the documents it references, and inform the appropriate organization of needed changes in accordance with SSTD-8070-0005-CONFIG.
- b. Responsibilities for the use and control of this SSTD and for the review and approval of revisions or cancellation of this SSTD shall be as specified in SSTD-8070-0005-CONFIG and the applicable documents referenced therein.

5.0 OPERATING CONDITIONS

<u>Service</u>	<u>Maximum Operating Pressure</u>	<u>Temperature Range</u>
Water	80 psig	+35°F - +120°

6.0 REQUIREMENTS

6.1 General

- a. All materials, components, and their interconnections shall be in compliance with the Mississippi Department of Health (MDH) Minimum Design Criteria for Mississippi Public Water Systems.

Stennis Standard	SSTD-8070-0070-PIPE	Basic
	<i>Number</i>	<i>Rev.</i>
	Effective Date: July 28, 2017	
	Review Date: July 28, 2022	
	Page 6 of 18	
Responsible Office: NASA SSC Center Operations Directorate		
SUBJECT: PVC and HDPE Piping for Potable Water Service Underground		

- b. Pipe for underground potable water distribution and transmission systems shall be designed to the following requirements:
 1. Typical design static pressure of 150 pounds per square inch (psig). Required pipe pressure rating or class shall incorporate calculation of dynamic / transient surges that may occur during operation during service life.
 2. Temperature Range, +35°F to +120°F, with nominal operating temperature at 73.4°F.
 3. Pipe Size, 4" - 24"
 - A. A maximum pipe size of 24" is assumed to account for future growth. Maximum existing pipe size is 16".
 - B. A minimum pipe size of 4" per MDH Minimum Design Criteria.
 - C. Other pipe sizes require case by case consideration.
- c. Installation methods applying critical stresses affecting pipe design shall be considered, such as placement via open excavation and various trenchless techniques, such as horizontal directional drilling.
- d. System design shall include installation of combination type air release and air and vacuum valves for release of entrapped air and prevention of vacuum creation at high points in the system.

6.2 Installation, Inspection, and Test Requirements

6.2.1 High-Density Polyethylene (HDPE) Potable Water Piping Systems

All HDPE potable water piping systems shall be installed, inspected, and tested in accordance with AWWA M55.

Size	4" through 24"
Pipe Materials / Details	ANSI/AWWA C906 HDPE resin shall be PE4710 in accordance with ASTM D3350, with a minimum cell classification of 45474 C, containing zero recycled content.